

SRI KALISWARI COLLEGE, SIVAKASI

**(An Autonomous Institution Affiliated to Madurai Kamaraj University,
Re- accredited with 'A' Grade (CGPA 3.30) by NAAC)**



**Programme Scheme, Scheme of Examinations and Syllabi
(With effect from June 2015)**

**Department of Biotechnology
(UG & PG Botany)**

Programme Outcome (PO) for Undergraduate Programme

Knowledge

PO 1: Well grounded knowledge in chosen subjects.

PO 2: Updated knowledge related to the subjects.

Skills

PO 1: Acquisition of cognitive skills

PO 2: Acquisition of Life Skills for Employment.

Attitude

PO 1: Holistic Personality Development through Self-directed and lifelong learning.

PO 2: Eco Sensitivity, inclusive culture, moral uprightless and social commitment.

Programme Specific Outcome (PSO) for Undergraduate Programme

Knowledge: Core Course of botany improve their knowledge and understanding of the subject.

Skill Development: Practical training in all the aspects of botany.

Higher level ability: Technical skills like Dissection of plants, Field study of flora, Plant pigment separation, Genetics, Biochemical tests and Isolation of microorganisms develop higher level ability.

Progression to higher studies: Indepth knowledge on Plant world, Algae&Bryophytes, Herbal botany, Plant breeding, Pteridophytes, Gymnosperms&Paleobotany equip the students to go for higher studies.

Entrepreneurship and Employment: Knowledge on Mushroom cultivation, Horticulture have ample employment opportunities.

SRI KALISWARI COLLEGE (AUTONOMOUS) – SIVAKASI
DEPARTMENT OF BOTANY
Choice Based Credit System-Curriculum Pattern
UG Programme-B.Sc., Botany-2015-2018

Part	Course code	Course Name	Hours	Credits
Semester I				
I	15UTAL11	Tamil/Hindi/French -I	6	3
II	15UENL11	General English-I	6	3
III	15UBYC11	Core I: Algae & Bryophytes Lab in Algae & Bryophytes	4 4	4 -
	15UBYA11	Allied Course-I: Chemistry-I Lab in Anc. Chemistry-I	4 2	3 -
IV	15UBYN11	Non Major Elective course-I: Plant world I	2	1
	15UBYE11	Enrichment course -I: Fundamentals of computers	2	1
		Total	30	15
Semester II				
I	15UTAL21	Tamil/Hindi/French-II	6	3
II	15UENL21	English-II	6	3
III	15UBYC21	Core II : Fungi, lichens & plant pathology	4	4
	15UBYC2P	Core III : Lab in Algae & Bryophytes, Fungi, lichens & plant pathology	4	3+3
	15UBYA21	Allied Course-I: Chemistry-II	4	3
	15UBYA2P	Allied Course-I: Lab in Anc.Chemistry	2	2+2
IV	15UBYN21	Non Major Elective course-II: Plant world II	2	1
	15UBYE21	Enrichment course-II: Horticulture	2	1
		Total	30	25
Semester III				
I	15UTAL31	Tamil/Hindi/French-III	6	3
II	15UENL31	English-III	6	3
III	15UBYC31	Core IV: Pteridophytes, Gymnosperms & Paleobotany Lab in Pteridophytes, Gymnosperms & Paleobotany	4 4	4 -
	15UBYA31	Allied Course-II : Zoology- I Lab in Anc. Zoology	4 2	3 -
IV	15UBYS31	Skill Based Course-I: Herbal botany	2	2
	15UBYV31	Value Based course- I: Mushroom cultivation	2	2
		Total	30	17

Semester IV				
I	15UTAL41	Tamil/Hindi/French-IV	6	3
II	15UENL41	English-IV	6	3
III	15UBYC41	Core V: Anatomy & Embryology	4	4
	15UBYC4P	Core VI : Lab in Anatomy & Embryology	4	3+3
	15UBYA41	Allied Course-II: Zoology-II	4	3
	15UBYA4P	Allied Course-IV: Lab in Anc. Zoology	2	2+2
	15UBYO41 15UBYO42	Optional/Elective Course-I: 1.Biochemistry 2. Plant Breeding and Evolution	4	3
		Extension		1
		Total	30	27
Semester V				
III	15UBYC51	CoreVII: Microbiology	5	5
	15UBYC52	CoreVIII: Plant Physiology	5	5
	15UBYC53	Core IX: Plant ecology and Phyto geography	5	4
		Lab in Microbiology	3	-
		Lab in Plant Physiology,	3	-
	15UBYO51 15UBYO52	Optional/Elective Course-II: 1. Biostatistics 2. Morphology of angiosperms	4	3
IV	15UBYS51	Skill Based course- II: Applied microbiology	2	2
	15UBYS52	Skill Based course- III: Nutrition science	2	2
	15UVED51	Value Education	1	1
		Total	30	22
SemesterVI				
III	15UBYC61	Core X: Taxonomy of angiosperms	5	5
	15UBYC62	Core XI: Cell Biology	5	5
	15UBYC63	Core XII: Genetics	4	4
	15UBYC6P	Core XIII: Lab in Taxonomy of angiosperms, Plant physiology.	3 3	6 6
	15UBYC6Q	Core XIV: Lab in Microbiology and Cell Biology		
	15UBYO61 15UBYO62	Optional/Elective Course-III: 1 Plant Biotechnology. 2. Biochemical techniques	4	3
IV	15UBYS61	Skill Based course-IV: Bio fertilizers	2	2
	15UBYV61	Value Based course-II: Economic botany	2	2
	15UESR61	Environmental studies	2	1
		Total	30	34
			180	140

Semester	I	II	III	IV	V	VI	Total
Credits	15	25	17	27	22	34	140

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

Choice Based Credit System

UG Programme - B.Sc., Botany-2015-2018

SEMESTER - I

CORE-I ALGAE & BRYOPHYTES- 15 UBYC11

Duration: 60 Hours

Credits: 3

Objectives:

- To provide a thorough knowledge about structure and life cycle pattern of algae and bryophytes.
- This paper will help the student get a grasp of the economic importance of algae and bryophytes

Course Outcome:

- Describe the essential features of diversity in plant kingdom and their salient features
- Provided a thorough knowledge about structure and life cycle pattern of algae and bryophytes.
- Gain understand on the economic importance of algae and bryophytes.
- Understand the Characteristics and ecology of major groups of algae and bryophytes
- Identify the methods for sampling algae and bryophytes in the field observation
- Assessed the environmental problems of algae and bryophytes

Unit: I (12 Hours)

Algae - General characters of algae, classification of algae (F.E. Fritsch). A brief account of thallus structure and variations. Economic Importance of algae.

Unit: II (12 Hours)

Study of the distribution, structure, reproduction and life cycle of the following:- *Oscillatoria*, *Spirogyra* and *Vaucheria*,.

Unit: III (12 Hours)

Study of the distribution, structure, reproduction and life cycle of the following - *Sargassum*, *Polysiphonia* & *Diatoms*.

Unit: IV (12 Hours)

Bryophytes:- General characters of Bryophytes. Classification of Bryophytes by Rothmaler, (1951). A short account on Economic importance of Bryophytes.

Unit: V (12 Hours)

A detailed study of the structure, reproduction and life cycles of the following genera: [Excluding development of sex organs & development of Sporophytes.] A detailed study of the following genera:- *Marchantia*, *Anthoceros* & *Polytrichum*.

Text Books:

1. Fritsch, F.E. (1935). The Structure & Reproduction of Algae, Cambridge University Press, Cambridge, U.K.
2. Pandey, B.P. (2000) . Text Book of Botany (Vol. I Algae, Fungi, & Lichens). S. Chand & Company, New Delhi.

References:

1. Smith, G.M. (1955). Cryptogamic Botany Vol. II. (2nd Edition) (Bryophytes & Pteridophytes), Tata McGraw Hill Publishing Co., New Delhi.

2. Parihar, N.S. (1976). An Introduction to Embryophyta – Vol.II. Bryophyta, Central Book Depot. Allahabad.
3. Dublish, P.K. & Agarwal, D.K. (1973). A Text Book of Bryophyta, Rajeeva Prakashan, Meerut, India.

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Choice Based Credit System

UG Programme - B.Sc., Botany-2015-2018

SEMESTER I

NON MAJOR ELECTIVE-I PLANT WORLD I- 15 UBYN 11 Duration: 30 Hours

Credits: 1

Objectives:

- To create an interest on plant world.
- To provide the knowledge about the plants and its role on earth.
- To familiarize students on plant food production.

Course outcomes

- Create an interest on the plant world
- Providing the knowledge about the plants and its role on earth.
- Familiarize the plant food production.
- Assess the native plants
- Learning the medicinal uses of wild plants
- Acquire knowledge on the process of essential oil

Unit: I (6Hours)

First Plant life-Appearance of photosynthesis. Biosphere-Blue green Algae-
Evolutions of plants-role of plants on geochemistry of earth.

Unit: II (6Hours)

Services of plant community- temperature regulation-control of earths-climate-
Biogeo chemical cycle.

Unit: III (6Hours)

General characters, classification (Brief account)-Algae, Fungi, Bryophytes,
Pteridophytes and Gymnosperms.

Unit: IV (6Hours)

Plant Diversity- Global level-National level-conservation of plant diversity.

Unit: V (6Hours)

Cultivated plants-Diversity-Vegetables-cereals, pulses, oil seeds, fruit plants-
Research stations in India.

Text Books:

1. Singh, V. P., Pande, C. and D.K. Jain, (2002). Text Book of Botany, Rastogi Publication, New Delhi.
2. Smith, G.M., (2009). Cryptogamic Botany, Volume I and II, Tata Mc Graw Hill, India.

References:

1. Dutta, A.C., (2004), Botany for Degree students, Oxford University press.
2. Pandey. B.P. (1977). A Text Book of Economic Botany, S. Chand & Company, New Delhi.
3. Sambamurthy, A.V.S.S. (1989), A text book of Economic Botany, Wiley Eastern Private Limited.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
Choice Based Credit System
UG Programme - B.Sc., Botany-2015-2018
SEMESTER - II

CORE-II Fungi, Lichens & Plant Pathology-15UBYC21

Duration: 60 Hours
Credits: 4

Objectives:

- To provide information about fungi and their importance.
- To provide the knowledge about the general aspects of plant diseases and their control

Course outcomes

- Gain knowledge on fungi, lichens & plant pathology and their importance.
- Gain understanding about the general aspects of plant diseases and their control.
- Enabling them to learn the structure, reproduction, culture, classifications, life-cycle of fungi, lichens and plant pathology.
- Explain the ecological distribution, morphology and economic importance of Fungi and lichens
- Describe the Function of lichens with significance of ectomycorrhiza and endomycorrhiza.
- Distinguish the plant pathogenesis, classification and host-parasite interaction.
- Define plant diseases in crops and their management, significant contributions of plant pathologists and usage of various techniques in plant protection.

Unit: I (12 Hours)

General Characteristics and Classification of fungi (C.J. Alexopoulos,1962). Economic importance of Fungi- Role of fungi as food, medicine, industries and growth regulators and harmful effects of fungi.

Unit: II (12 Hours)

A study of the occurrence, structure, reproduction and life cycle of the following genera: *Penicillium*, *Puccinia* and *Rhizopus*.

UNIT: III (12 Hours)

Lichens: General characteristics, types, somatic structures – soredia, isidia occurrence, classification, economic importance. Structure and reproduction of *Usnea*.

UNIT: IV (12 Hours)

Classification of plant diseases, Symptoms, bacterial, fungal, viral plant diseases. Methods of protection- Cultural practices – Physical, Chemical & Biological controls and quarantine methods.

UNIT: V (12 Hours)

Study of the following plant diseases with special reference to the symptoms, causal organisms, and disease cycle and control measure of

1. Tikka Disease of Groundnut
2. Red rot of sugarcane
3. Citrus canker
4. TMV

5. Wilt of Cotton

Text Books:

1. Burnett, J.H. (1968). Fundamentals of Mycology, Edward Arnold (Publishers) Ltd., London.
2. Pandey, B.P. (1997). College Botany (Vol. I Fungi, & Lichens, Pathology). S. Chand & Company, New Delhi.
3. Bilgrami, K.S. & H.C. Dube, (1990). A Text Book of Plant Pathology, Vikas publishing House Pvt., Ltd., New Delhi.

References:

1. Hawker, L.E. (1969). Fungi, Hutchinson University Library, London.
2. Mehrotra, R.S. (1994). Plant Pathology, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
3. Sharma, D. (1996). Plant Pathology, Rastogi Publications, Meerut, India.

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UG Programme - B.Sc., Botany-2015-2018

SEMESTER II

NON MAJOR ELECTIVE-II PLANT WORLD II-15UBYN21 Duration: 30 Hours

Credits: 1

Objectives:

- To inculcate in students the dependence of man on plants.
- To provide knowledge base on various plant products the humanity depends on.

Course outcomes:

- Create understanding on various plant products the humanity depends on.
- Explain the relation between plants and human life.
- Define the student's dependence in man and plants.
- Improve the traditional knowledge about the important medicinal plants.
- Analyzing the processing methods of medicinal plants
- Learning conservation and utilization of threatened plants

Unit: I (6Hours)

Brief study of the following economic produces with special references to Botanical name, family and morphology of useful parts and uses: Cereals – Paddy and wheat, Pulses – red gram and soya beans, Vegetables- tomato and potato, Fruits- apple and mango.

Unit: II (6Hours)

Brief study of the following economic produces with special references to Botanical name, family and morphology of useful parts and uses: Drugs- Cinchona and Turpentine, Narcotic- Tobacco, Hashish (Cannabis) Timber- Teak and rose wood. Resin and gums – Oleoresin and Canada balsam.

Unit: III (6Hours)

Brief study of the following economic produces with special references to Botanical name, family and morphology of useful parts and uses: Latex – Rubber Gutta percha, fiber- Cotton and jute, Oil- Coconut oil and gingelly oil, Beverages- Cocoa and coffee.

Unit: IV (6Hours)

Brief study of the following economic produces with special references to Botanical name, family and morphology of useful parts and uses: Spices and condiments – Garlic, cardamom, Ginger and pepper, Medicinal plants – digitalin, Serpentine, Vincristine and Curcumin. Essential oil- lemon grass oil and sandal wood oil.

Unit: V (6Hours)

Methods of processing – Tea and Eucalyptus oil, Extraction of biodiesel from *Jatropha curcus* and *Pongamia glabra*.

Text Books:

1. Pandey, B.P. (2004). Economic Botany, S. Chand & Company, New Delhi.
2. Sambamurthy, A (1989), Text Book of Economic Botany, Wiley Eastern Private Limited.
3. Panda, H. (2004), Herbs cultivation and medicinal uses, NIIR publication, Delhi.

Reference Books:

1. Kochar, S.L.(1997). Economic Botany, Mac Millan Indian Limited, New Delhi.
2. Joshi,S.G.(2004). Medicinal plants, Oxford & IBH Publishing co.Ltd.New Delhi.
3. Sambamurthy, A.V.S.S. (1989), A text book of Economic Botany, Wiley Eastern Private Limited.

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SEMESTER - II

ENRICHMENT COURSE II HORTICULTURE-15UBYE21 Duration: 30 Hours

Credits: 1

Objectives:

- To provide knowledge on various techniques in horticulture and gardening.
- To know about the basic cultivation method of horticultural crops.

Course outcomes

- Identify various techniques in horticulture and gardening.
- Explain the basic cultivation method of horticultural crops.
- Describe the importance of horticultural crops and their propagation methods.
- Define the types of gardens and their establishment.
- Gain knowledge in floriculture and fruit culture, green house and nursery management
- Acquire with s bonsai methods
- Becomes an entrepreneur through gaining knowledge in horticultural techniques.

Unit I (6 Hours)

Scope and importance of horticulture. Classification of horticultural crops – Climate, soil, water and nutritional needs of Papaya, Bhendi, Brinjal and Sapota.

Unit II (6 Hours)

Vegetative Propagation methods: cuttage- leaf, stem and root cutting. Layerage- Simple layering, compound and air layering, budding- T budding, Graftage- Approach and whip grafting.

Unit III (6 Hours)

Gardening: Types of gardens – planning and layout of indoor garden and kitchen garden Designing and preparation of green house, bonsai and rockery.

Unit IV (6 Hours)

Cultivation of flowers – Jasmine and rose. Planning and lay out of orchards. Preservation and storage methods of fruits and vegetables.

Unit V (6 Hours)

Plant protection: General account of insecticides and pesticides, common diseases of fruits and vegetable crops any two diseases in each crop – Papaya, Sapota, Brinjal and Bhendi (No life cycle is required)

Text Books:

1. Bose, T.K. & Mukherjee, D. (1972). Gardening in India, Oxford & IBH Publishing Co., Kolkatta, Mumbai, New Delhi.
2. Sandhu, M.K. (1989). Plant Propagation, Wiley Eastern Ltd., New Delhi.
3. Kumar , N. (1997). Introduction to Horticulture, Rajalakshmi Publications, Nagercoil, India.

Reference Books:

1. Edmond Musser & Andres (1988). Fundamentals of Horticulture, McGraw Hill Book Co., Mumbai.
2. Sundararajan, J.S. Muthuswamy, J. Shanmugavelu, K.G. Balakrishnan, R. (1995). A guide to horticulture, Thiruvankadam Printers, Coimbatore.

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Choice Based Credit System

UG Programme - B.Sc., Botany-2015-2018

SEMESTER – I & II

CORE-III Lab in Algae Fungi, Lichens, Bryophytes & Plant Pathology-15UBYC2P

Duration: 60 Hours

Credits: 7

Objectives:

- To study and identify the Microalgae and Bryophytes and their thallus structures.
- To enrich the knowledge about various plant diseases and their symptoms.

Course Outcome:

- Explain to identify various forms of Algae
- Describe the internal and reproduction structure of Bryophytes
- Learning the mounting techniques of various biological specimens
- Improve the knowledge and skills in identifying the museum specimens
- Define the various plant diseases.
- Gain understanding the various types of microbial techniques.
- Understand the pure culture technique

Syllabus:

1. To make suitable temporary micro preparation of the types prescribed in Algae, Fungi, Lichens, Bryophytes & Plant Pathology.
2. To observe and identify the specimen at sight and write illustrated and explanatory notes on them.
3. To observe and identify at sight and make detailed study of type of the diseases specified.
4. To maintain observation note and submit for external valuation.

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UG Programme - B.Sc., Botany-2014-2017

SEMESTER - III

CORE-IV Pteridophytes, Gymnosperms and Paleobotany- 14 UBYC31

Duration: 60 Hours

Credits: 4

Objectives:

- To provide a thorough knowledge about structure and life cycle pattern of Pteridophytes, and Gymnosperms.
- To help the student to get a Knowledge about fossils and their importance.

Course outcomes

- Understand the salient features of Pteridophytes, Gymnosperms and Paleobotany
- Identifying the importance of fossils and fossilization process in tracing evolution.
- Gain thorough knowledge about structure and life cycle pattern of Pteridophytes and Gymnosperms.
- Explain the structure and reproduction of various genera mentioned in the syllabus.
- Describe the Morphology and Anatomy characters of Pteridophyte and Gymnosperm
- Understand the Reproduction and evolutionary trends in Pteridophytes and Gymnosperm.
- Acquire knowledge in the structure and method of fossil formation.
- Learning the geological era.

Unit: I (12 Hours)

Pteridophytes -general characteristics and classification by Smith. Structure and Reproduction of *Psilotum*, *Lycopodium* (Need not study the developmental aspects).

Unit: II (12 Hours)

External and internal Structure and Reproduction of *Selaginella*, *Equisetum* and *Marsilea*.

Unit: III (12 Hours)

Gymnosperms- general characteristics and classification of Gymnosperms by Chamberlin, structure and reproduction of *Pinus*. (Need not study the developmental aspects).

Unit: IV (12 Hours)

External morphology, anatomy and Reproduction of *Gnetum*. (Need not study the developmental aspects). Economic importance of Gymnosperms.

Unit: V (12 Hours)

Paleobotany- General classification of Geological era. Brief study of the methods of formation of fossils. A brief study of the following fossil forms:- *Rhynia*, *Lepidodendron*.

Text Books:

1. Vashishta. P.C. 1972 Botany for Degree Students, Vol IV – Vascular Cryptogams (Pteridophyta), S.Chand & Co. Pvt. Ltd.,
2. Vashista. P.C. 1976. Gymnosperms, S.Chand & Co Pvt. Ltd., 1976.
3. Pandey. B.P. 1977. A Text Book of Bryophyta, Pteridophyta and Gymnosperms. K.Nath and Co., Meerut.

References:

1. Smith, G.M. 1935. Cryptogamic Botany. Vol-III, Tata McGraw Hill Publishing Co., New Delhi.
2. Arnolds, C.A. 1947. An Introduction to paleobaotany, McGraw Hill Book Co., New York.
3. Sporne, K.R. 1991. The Morphology of Gymnosperms. B.I. Publications Pvt. Mumbai.
4. Chamberlain C.J Gymnosperm, Structure and Evolution.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

Choice Based Credit System

UG Programme - B.Sc., Botany-2015-2018

SEMESTER - III

ALLIED COURSE-II Zoology I - 15 UBYA31

Duration: 60Hours

Credits: 4

Objectives:

- To learn the diversity of organisms in a systematic manner
- To understand the form and functions of non-chordate animals

Course Outcome:

- Understand the nature and control measures of malaria.
- Knowledge on formation of Coral reefs and its applications.
- Understand the morphology and other features of worm.
- Knowledge on the life cycle of sea organisms.
- Complete understanding on life cycle of invertebrates.

Unit: I

(12 Hours)

Taxonomy

1. Definition 2.Principles of classification 3. Binomial nomenclature

Unit: II

Hours)

(12

Protozoa & Porifera

Protozoa:

1. *Paramecium* —General organization, and Conjugation only Protozoan diseases and their control (Plasmodium Life cycle in detail)

Porifera:

1. *Olynthus* – General organization, Reproduction and Development only.
2. Economic importance of sponges

Unit: III

Hours)

(12

Coelenterata & Helminthes

Coelenterata:

1. *Obelia* – Structure of Obelia colony, Medusa and Nematocyst.
2. Coral reefs -- formation and its types

Helminthes:

1. *Taenia solium* (Tape worm) – External characters, Digestive system, Excretory system, Reproductive system and Development (Life cycle).
2. Structure, Pathology and control measures of *Ascaris* .

Unit: IV

Hours)

(12

Annelida & Arthropoda

Annelida:

Earthworm – External morphology, Setae, Nephridia, Nervous system and Reproductive system.

Arthropoda:

Penaeus (Marine Prawn) – External morphology, Appendages, Respiratory system, Reproductive system and Development.

Hours)

Mollusca & Echinodermata

Mollusca:

1. *Pila globosa* – External morphology, digestive system, Respiratory system,

Echinodermata:

1. Star fish – External morphology, Water vascular system only.
2. Larval forms in Echinodermata.

Text books

1. A text book of Invertebrata - N. Arumugam *et al.*, (2008) Saras publications, Kottar, Nagercoil.
2. A Manual of zoology – M. Ekambaranatha Iyer and T.N. Ananthakrishna. (2003 Reprint) S. Viswanathan publishers – Chennai.

Reference books

1. Invertebrate zoology – T.C.Majupuria, (2001) PJradeep Publications. Jalandar.
2. Invertebrate Zoology – E. L. Jordon and P.S. Verma (2005 Reprint) S. Chand and Company, 7361, Ram nagar, New Delhi – 110 055; ISBN 81-219-0367- X .
3. Invertebrare Zoology – R. L. Kotpal, (2005 Reprint) Third Edition published by Rakesh Rastogi for rastogi publications, Meerat.
4. Invertebrate Zoology – P.S. Dhami and J.K. Dhami (2003) R. Chand and Company, New Delhi.

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Choice based credit system
UG Programme - B.Sc., Botany 2014-2017
Semester - III

Value based course- I Mushroom Cultivation – 14UBYV31 Duration: 30 Hours
Credits: 1

Objectives:

- To provide the information about mushroom and their uses
- To make the students to be more familiar in mushroom cultivation

Course outcomes

- Provide information about mushroom and their uses
- Become familiar in mushroom cultivation
- Understand the cultivation process of mushrooms.
- Gain insight on spawn preparation technique
- Understand the various types of mushroom diseases and control
- Gain Knowledge about processing of mushrooms.
- Becoming an entrepreneur through the knowledge of mushroom cultivation

Unit: I (6 Hours)

History and introduction. Importance, Nutritional value, medicinal value, Recipes of Mushroom. Edible mushrooms and Poisonous mushrooms in the world.

Unit: II (6 Hours)

Systematic position, morphology, climatic needs, distribution, and general characters of *Agaricus, volvariella* and *Pleurotus* spp.

Unit: III (6 Hours)

Requirements for mushroom cultivation – spawn production, Cultivation of mushrooms-Oyster mushroom and White button mushroom. Oyster mushroom - Polythene bag method.

Unit: IV (6 Hours)

Diseases - Common pests, disease prevention and control measures. Processing - Blanching, steeping, sun drying, canning, pickling, freeze drying. Storage – short term and long term storage.

Unit: V (6 Hours)

Common Indian mushrooms and world. Production level and economics of mushroom. Mushroom training and research centers in India and job opportunities.

Text Books:

1. Kaul T N (2001). Biology and conservation of mushrooms. Oxford and IBH publishing company N.Delhi
2. Gupta P.K. Elements of Biotechnology.
3. Harander Singh. (1991). Mushrooms- The Art of Cultivation- Sterling Publishers.

References

1. Indian Journal of Mushrooms. Published by I.M.G.A. *Mushroom Research Laboratory*. College Agriculture, Solan
2. Peter Oei (2000) *Mushroom Cultivation III Edition*, Backhuyes Publisher USA
3. Tripathi DP., (2005) *Mushroom Cultivation Oxford and IBH Publishing Co. Pvt. Ltd*, New Delhi

SRI KALISWARI COLLEGE (AUTONOMMOUS), SIVAKASI
Choice based credit system
UG Programme - B.Sc., Botany 2014-2017
Semester - III

Skill based course- I Herbal Botany-14UBYS31

Duration: 30 Hours
Credits: 1

Objectives:

- To provide the information about the importance of medicinal plants
- To make the students to be more familiar in medicinal plants cultivation
- To make them to discern the marketing of medicinal plants .

Course outcomes:

- Provide knowledge about the importance of medicinal plants.
- Familiarize in medicinal plants cultivation and conservation.
- Acquire with making and processing of medicinal plants.
- Understand the systematic position, diagnostic feature and medicinal uses of selected plants.
- Acquired knowledge on different systems of medicinal plants (Siddha, Ayurveda and Unani)
- Gain understanding in conservation methods of medicinal plants.

Unit: I – (6 Hours)

Introduction- scope and importance of Medicinal plants- present status and future prospectus of medicinal crops- opportunities.

Unit: II – (6 Hours)

Traditional system of medicine- Siddha, Ayurveda, Unani. Conservation of medicinal plants- *In situ* and *Ex situ* conservation methods.

Unit: III – (6 Hours)

Study the systematic position, diagnostic features and medicinal uses of following plants: *Gloriosa superba*, *Coriander sativum*, *Aloe vera* and *Phyllanthus niruri*.

Unit: IV– (6 Hours)

Study the systematic position, diagnostic features and medicinal uses of following plants: *Aegle marmelos*, *Catharanthus roseus*, *Azadirachta indica* and *Acorus calamus*

Unit: V– (6 Hours)

Study the systematic position, diagnostic features and medicinal uses of following plants: *Curcuma longa*, *Zingiber officinale*, *Gymnema sylvestris*. Standardization of crude drugs – (microscopic, macroscopic and phytochemical) Drug adulterations.

Text books:

1. Sharma, R., (2004) Agro techniques of medicinal plants, Daya publishing House, New Delhi.
2. Azhar Ali Farooqi and B.S. Sreeramu, (2001), Cultivation of medicinal and aromatic crops, University press India.
3. Purohit, S.S and S.P. Vyas, (2006) Medicinal plant cultivation – scientific Approach, Agrobios, India.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

Choice Based Credit System

UG Programme - B.Sc., Botany-2014-2017

SEMESTER - IV

CORE-V Plant Anatomy & Embryology of Angiosperms-14UBYC41

Duration: 60 Hours

Credits: 4

Objectives:

- To provide information about internal structure of stem, root and leaf.
- To provide the knowledge about the general aspects of Plant reproductive organs and embryo and its development.

Course outcomes

- Provide information about internal structure of stem, root and leaf.
- Improve the knowledge about the general aspects of plant reproductive organs and embryo and its development.
- Identify the fundamental practices of plant embryology
- Provide knowledge about the various aspects of morphogenesis
- Identifying the key aspects of embryology of Angiosperms
- Understand the process of formation of male and female sexual representatives,
- Understand the mechanism of fertilization in angiosperms.
- Gain knowledge in embryo development and endosperms

Unit: I

(12 Hours)

Structure, Classification and function of Apical Meristems - Theories of Meristems-apical cell theory, Tunica – Carpus and Histogen theory.

Unit: II

(12

Hours)

Structure and function of simple and permanent tissues - Parenchyma, Collenchyma, Sclerenchyma. Complex permanent tissues- Xylem and Phloem. Primary Structures of Monocot stem and root. Structure of Dicot leaf.

UNIT: III

(12

Hours)

Primary and secondary growth of Dicot stem and root. Anomalous secondary growth in Dicots – Boerhaavia, and monocot stem-Dracaena.

UNIT: IV

(12

Hours)

Embryology :- Structure and development of microsporangium, male gametophyte, megasporangium, Types of ovule, female gametophyte (Polygonum type). Double Fertilization.

UNIT: V

(12

Hours)

Types of Endosperms-Nuclear, cellular and helobial and Ruminant types. Development of embryo – dicot and Monocot. Polyembryony and Parthenogenesis.

Text Books:

1. Pandey, B.P. (1978) Plant Anatomy, S. Chand and Co., New Delhi.
2. Vashishta, P.C. (1996) A text book of Plant Anatomy - S.Chand & Co., NewDelhi.
3. S.S.Bhojwani &Bhatnagar,S.P. (2004) The Embryology of Angiosperms, Vani Educational Books New Delhi.

References:

1. Fahn, A. 1982. Plant Anatomy (3rd edition). Pergoman Press, Oxford.
2. Anatomy of seed plants - Esau. K. Wiley Eastern Ltd.,NewDelhi.
3. Maheswari, P. 1971. An Introduction to the Embryology of Angiosperms. Tata McGraw Hill Publishing Co., Ltd., New Delhi.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
Choice Based Credit System
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SEMESTER – III & IV

CORE-V

Duration: 60 Hours

**PTERIDOPHYTES, GYMNOSPERMS,
ANATOMY and EMBROLOGY-15UBYC4P**

Credits: 7

Objectives:

- To enrich the knowledge on various developmental stages and plant reproduction
- To grasp the knowledge on mounting techniques.
- To gain the knowledge on morphological and anatomical structure of plant cells.

Course Outcome:

- Helps to identify various forms of cryptogams
- learn mounting techniques of various biological specimens
- Enrich their knowledge and skills in identifying the museum specimens
- Impart the knowledge about various developmental stages of plant reproduction
- Familiarize with Plant tissue culture.
- Gain understanding in morphological and anatomical cell structures of plants.

Syllabus

- To make suitable micro preparation of the types prescribed in Pteridophytes, Gymnosperms and Anatomy.
- To observe and identify the Sections of anther and ovule.
- To observe and identify the Microscopic and macroscopic specimens at sight and write illustrated and explanatory notes on them.
- To observe and identify the fossil slides included in the syllabus.
- Preparation of Permanent Slide (Two slides).
- To observe and identify the developmental stages of anther and embryo using permanent slides.
- To dissect and mount embryo (*Cleome* and *Tridax*).
- To maintain an observation notebook and submit for external valuation.

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SEMESTER – IV

Allied Course-II: Zoology-II-14UBYA41

Duration: 60 Hours

Credits: 4

Objectives:

- To study the structure and organization of vertebrates
- To understand the functional morphology and comparative anatomy of chordates

Course Outcome:

- Complete understanding on life cycle of chordates.
- Knowledge on flightless birds and its migration.
- Understand the digestive, excretory and reproductive system of amphioxus.
- Understand the digestive, excretory and reproductive system of shark.
- Knowledge on the adaptation of aquatic animals.

Unit: I

(12 Hours)

Phylum Chordata and Prochordates

1. General characters of Chordata and its outline classification upto class level
2. General characters of Prochordates and its outline classification
3. Amphioxus- External features, Digestive system, excretory system, and reproductive system
4. Affinities of Prochordates

Unit: II

(12

Hours)

Pisces and Amphibia

1. Shark :- External features , Digestive and reproductive system
2. Accessory respiratory organs in fishes
3. Parental care in amphibians

UNIT: III

(12

Hours)

Reptilia

1. General Characters of Reptiles.
2. Poisonous and Non-poisonous snakes – Identification, biting Mechanism and First aid.

UNIT: IV

(12

Hours)

Aves

1. General characters of class Aves
2. Flightless Birds and their distribution
3. Migration in birds
4. Flight adaptation in birds

UNIT: V

(12

Hours)

Mammalia

1. Rabbit – External morphology, Digestive system, and Reproductive System only.
2. Dentition in mammals
3. Adaptation of aquatic mammals

Text Books

1. Ekambaranatha Ayyar, M., & Ananthakrishnan, T.N. – A manual of Zoology – (2005 Reprint) Volume II, Chordata; S. Visvanathan (Printers and Publishers) Pvt Ltd. Chennai.
2. Kotpal, R.L – Vertebrata, (2005 Reprint) Third Edition, published by Rakesh kumar rastogi for Rastogi Publishers, Ganapathi Shivaji road, Meerut- 250 002.

References

1. Alexander, R. MCN (1981) The chordates –II International Edition- Cambridge University press, New Delhi.
2. Kent. C. George. – Comparative anatomy of Vertebrates. Mosby International Edition. Toppan printing, Japan, Library of Congress Catalogue, Card No: 65-15973.
3. Romer, R.S & Parson,T.S. (1986)- the Vertebrate Body, VII Edition, W.B.Saunders, Philadelphia.
4. E.L.Jordon and P.S.Verma – Chordate Zoology (2006 Reprint) published by S.Chand and Co. 7361, Ram nagar, New Delhi – 110 055. ISBN: 81—219 – 1839 -9.
5. P.S.Dhami and J.K. Dhami., Chordate Zoology (2006 Reprint) – R.Chand and company. New Delhi.

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SEMESTER – III & IV

ALLIED COURSE-II LAB IN ANCILLARY ZOOLOGY – 14UBYA4P

Duration: 60 Hours

Credit: 4

Objectives:

- To understand the nervous system of earth worm.
- To grasp the oral features of honey bees.
- To understand the features of frogs venous system.

Course Outcome:

- Ability to differentiate the microscopic spotters of various invertebrates.
- Ability to differentiate the microscopic spotters of chordates.
- Understand the dissemination of annelid.
- Understand the dissemination of arthropoda.
- Knowledge on differentiation various reptiles.

Dissection

Demo

Earthworm: Nerve ring and Nerve cord, Body setae mounting.

Charts

Honey Bee: Mounting of Mouth parts and sting of Honey Bee

SPOTTERS

INVERTEBRATES

Protozoa : Amoeba, Paramecium, Euglena and Plasmodium

Coelenterata: Obelia colony, Obelia medusa, Jelly Fish, Sea anemone.

Helminthes: Tape worm, Live fluke, Redia and Cercaris.

Nematodes: Ascaris and Wuchereria

Annelida : Earthworm, Nereis, Leech.

Arthropoda: Prawn, Zoea larva, Mysis larva, Centipede.

Mollusca: Pila, Pearl oyster

Echindermata: Star fish – oral and Aboral view.

SEMESTER IV

Dissection

Demo

Frog – Arterial venous system

CHORDATES

Spotters

Prochordata: Amphioxus, Balanoglossus, Asidian.

Pisces: Narcine, Echeneis, Hippocampus, Eel, Catla, Tilapia

Amphibian: Bufo, Rhacophorus, Salamander.

Reptilia: Cobra, Krait and Viper, Dryophis and Ptyas.

Aves: Pectoral and Pelvic girdle of Pigeon, Archaeopteryx.

Mammals: Bat, Loris.

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Semester – IV

OPTIONAL/ ELECTIVE BIOCHEMISTRY – 14UBYO41

Duration: 60 Hours

Credits-3

Objectives:

- To understand the basic features of carbohydrates.
- To differentiate the different classes of protein based on its structure.
- To grasp the features of lipids and its classification.
- To understand the role of enzymes in biological system.

Course outcomes

- Identifying the fundamentals of biochemistry in relation to botany
- Ability to understand the structure of protein and lipids
- Understand the structure of DNA and RNA
- Know the mechanism of enzyme action
- Understand the concept and laws of thermodynamics
- Learning the operating systems of instruments

Unit: I (12 Hours)

Structure, Function, Classification of Carbohydrates (monosaccharides/ oligosaccharides/ polysaccharides) Glucose, starch, cellulose and hemicelluloses.

Unit : II (12 Hours)

Structure, Function, Classification of Protein (primary, secondary, tertiary and quaternary) and Amino acids.

Unit : III (12 Hours)

Lipid: Structure and functions of lipids. classification of fatty acid: saturated and unsaturated fatty acids. Structure and Biological functions of cholesterol.

Unit : IV (12 Hours)

Nucleic acid: Structure of DNA and RNA- functions and properties. Vitamins: Classification, Functions.

Unit : V (12 Hours)

Enzymes- Discovery and Nomenclature; characteristics of enzymes; Definition of holoenzyme, apoenzyme, coenzyme and co-factors- Lock and key model.

Text books:

1. Lehninger, A.L., Nelson, D.L., Cox, M.M (2004) Principles of Biochemistry, 4th edition, W.H. Freeman and company, New York.
2. Jain J.L., Sunjay Jain, Nitin Jain (2007) Fundamentals of Biochemistry, 6th edition, S.Chand and company Ltd.
3. Sathyanarayana (2006) Text book of Biochemistry 3rd edition, Uppala author publisher interlinks.

References:

1. Voet .D., Voet J.G., and Pratt, C.W (2011) Fundamentals of Biochemistry, 4th Edition John Wiley and sons, New York.
2. Murray R.K., D.K. Granner, P.A. Mayes & V.W. Rodwell, Harper's Biochemistry, 25TH Edition, Mc Graw Hill Publications.
3. Tymouzko J.L. and Stryer Berg (2007) Biochemistry, sixth edition, W.H. Freeman company, New York.

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Choice Based Credit System
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Semester – V

Duration: 75 Hours
Credit- 5

CORE- VII: TAXONOMY OF ANGIOSPERMS - 14UBYC51

Objectives:

- To provide a thorough knowledge about Angiosperms.
- To impart the knowledge on identification of plant species.

Course outcomes

- Understand the morphological features of vegetative, inflorescence, fruits and seed characters.
- Provide knowledge on botanical nomenclature, classifications, merits and demerits of various systems of classifications.
- Understand the systematic positions of the selected families of the flowering plants with their economic importance.
- Improved knowledge on the economically important plants with their systematic treatment.
- Gain knowledge to identify the plant species.
- Familiarize with local flora and herbarium techniques.

UNIT I (15 Hours)

Characteristic of Angiosperms: and brief History, Scope and importance of Plant Taxonomy, Botanical nomenclature: Binomial Systems, ICBN: Principles; Rank of taxa, Retention and rejection of names; Typifications; Effective and valid publication; Author Citation.

UNIT II (15Hours)

Classification- Natural, Artificial and Phylogenetic system of Classification. Merits and Demerits. Botanical Gardens: Concept and importance: Botanical Gardens of National and International.

UNIT III (15Hours)

External morphology of vegetative and floral parts. Herbarium: Herbarium techniques, importance of herbarium, Centers of herbarium.

UNIT IV (15Hours)

Taxonomical study of the following taxa and their economic importance:

Dicotyledons: A) Polypetalae: Brassicaceae (Cruciferae), Rutaceae, (sub families: Caesalpinaceae), Cucurbitaceae, Apiaceae, Nymphaeaceae

B) Gamopetalae: Rubiaceae: Asteraceae, Asclepiadiaceae, Solanaceae, Acanthaceae, Lamiaceae

UNIT V (15Hours)

Monochlamydae: Amaranthaceae, Euphorbiaceae,

Monocotyledons: Liliaceae, Arecaceae, Poaceae

TEXT BOOKS

- 1) Cronquist A 1968. The Evolution and classification of flowering plants, Thomas Nelson and Sons Ltd., London.
- 2) Jeffrey C 1982. 2nd edn. An Introduction to Plant Taxonomy, Cambridge Uni. Press.
- 3) Jhori B M and Bhattacharjee S P 1994. Taxonomy of Angiosperms. Narosa Publishers, New Delhi.
- 4) Lawrence GHM 1951. Taxonomy of Vascular Plants. MacMillan, London.

REFERENCES

- 1) Naik N 1984. Taxonomy of Angiosperms, Tata McGraw Hill, New Delhi.
- 2) Pullaiah T. 1998. Taxonomy of Angiosperms. Regency Publications, New Delhi.
- 3) Sivaranjan V V. 1984. Introduction to Principles of Plant Taxonomy, Kalyani Publishers, New Delhi.
- 4) Sambamurthy. 2005. Taxonomy of Angiosperms. I K International Pvt. Ltd., New Delhi.
- 5) Kocchar, S.L. 1998. Economic Botany of Tropics.

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U.G Programme- B.Sc., Botany (2014-2017)

Semester – V

Hours

Duration: 75

Credits- 5

CORE VIII: PLANT PHYSIOLOGY- 14UBYC52

Objectives:

- To provide a thorough knowledge about physiological fractions of Plants.
- To provide an idea on biological synthesis of plant hormones, photosynthesis and respiration.

Course outcomes

- Provide a thorough knowledge about physiological fractions of Plants.
- Understand the role of water and its relationship in plants
- Gain knowledge on functions of various elements in plants
- Provide an idea on biological synthesis of plant hormones, photosynthesis and respiration.
- Understand the metabolic activities of plants
- Gain knowledge on structure, properties and significance of water - osmotic and non-osmotic uptake of water Relations.
- Improve the knowledge of Photosynthesis and respiratory systems of plants.

UNIT I (15 Hours)

Water Relations: Imbibition, Diffusion, and Osmosis, water potential, wall pressure, turgor pressure, Transpiration: types, mechanism of stomatal movement, Guttation,

UNIT II (15 Hours)

Absorption of water-Active and passive, absorption of minerals – ion exchange, active and passive. Ascent of sap- transpiration pull- cohesion and adhesion theory. Role of macro (N,P,K,S,Ca) and micro (B,Mn,Mg,Zn, Mo,Fe,Cu,N) elements in plant metabolism.

UNIT III (15 Hours)

Photosynthesis: Photosynthetic pigment systems - radiant energy - cyclic and noncyclic photophosphorylation, dark reaction- C₃ (Calvin cycle) and C₄ (Hatch and slack cycle) pathways, Electron transport system. - factors affecting photosynthesis - photorespiration
Respiration: Aerobic - anaerobic, Glycolysis, Krebs' cycle, Electron transport system, ATP synthesis, Factors affecting respiration. Respiratory Quotient.

UNIT IV (15 Hours)

Photoperiodism- long day, short day and day neutral plants, Phytochrome and its role in flowering, vernalization, seed dormancy, factors affecting seed dormancy, Physical and Chemical methods of breaking seed dormancy.

UNIT V (15 Hours)

Plant growth regulators- Physiological role of auxins, gibberellins, cytokinins, ethylene and abscisic acid. Classification of Plant movements-Geotropism, Phototropism, Thigmotropism, Chemotropism.

TEXT BOOKS

1. Pandey, S.N. 1991-Plant Physiology, Tata McGraw Hill Publishers(P)Ltd, New Delhi.
2. Verma, S.K.1999-A Text Book of Plant Physiology, S.Chand and Company Ltd.New Delhi.
3. Malik, C.P. 1999- Plant Physiology, Kalyani Publishers, Ludhiyana.

REFERENCES

1. Jain, V.K, 2000. Fundamentals of Plant Physiology. S.Chand and Co., New Delhi.
2. Gill, D.S. 2000 - Plant Physiology, S.Chand and Co., New Delhi.
3. Srivastava, H.N.1990-Plant Physiology, Pradeep Publications,Jalandhar.144008.
4. Nogle, G.R., and Fritz, G.J., 1982-Introductory Plant Physiology. Prentice Hall of India Private Ltd.

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U.G Programme- B.Sc., Botany (2014-2017)
Semester – V

Duration: 60 Hours
Credits- 4

CORE- IX - CELL BIOLOGY- 14UBYC53

Objectives

- To provide a thorough knowledge about structure and function of Cells, bio molecules and cellular development.
- To provide the knowledge on advances in cell biology.

Course outcomes

- Identify the structure and function of Cells.
- Provide the knowledge on advances in cell biology.
- Gain In-depth understanding in microscopy, cell organelles of Prokaryotic and Eukaryotic cells.
- Understand gene regulation and chloroplast and mitochondria genome organization.
- Identify the significance of mitosis and meiosis cell divisions
- Understand about the cellular components
- Gain knowledge about cell biology to selected examples of changes or losses in cell function.

UNIT I (12 Hours)

Overview of prokaryotic and eukaryotic cells, cell size and shape, Ultrastructure of a plant cell, cell wall. Plasma membrane- Trilaminar model, fluid mosaic model, chemical composition.

UNIT II (12 Hours)

Membrane functions – permeability of plasma membrane to water and solutes – conc. gradients – movements of ions – Passive diffusion – Active Transport, pinocytosis – phagocytosis.

UNIT III (12 Hours)

Structure and functions of Chloroplast, Mitochondria, Endoplasmic reticulum, Golgi complex, lysosome and ribosomes, Microbodies - Peroxisomes and glyoxysomes.

UNIT IV (12 Hours)

Chromosomes- Types, morphology, giant chromosomes- polytene, lamp brush chromosomes. Heterochromatin, Euchromatin. Karyotype,

UNIT V (12 Hours)

Cell division- Amitosis, mitosis and meiosis, Dynamics of cell division. Significance of mitosis and meiosis. Cell cycle.

TEXT BOOKS

1. Rastogi, S.C. 1992 – Cell biology – TATA McGraw Hill publishing Co, New Delhi.
2. Sundararajan, S. 2000 – Cytology, Anmol Publication (P) Ltd., New Delhi.
3. Singh S.P&Tomar B.S 1996 –Cell biology, Rastogi Publication, Meerut.

REFERENCES

1. De Robertis, E.D.P. and De Robertis, E.M.F. 2006. Cell and Molecular Biology. 8th edition. Lippincott Williams and Wilkins, Philadelphia.
2. Cooper, G.M. and Hausman, R.E. 2009. The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
3. Karp, G. 2010. Cell and Molecular Biology: Concepts and Experiments. 6th Edition. John Wiley & Sons. Inc

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Choice Based Credit System
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Semester – V

Duration: 45 Hours
Credits- 3

CORE X: LAB IN TAXONOMY OF ANGIOSPERMS- 14UBYC5P

Objectives:

- To study the plants and identify the botanical name and their locality.
- To enrich the knowledge about the preparation of Herbarium.

Course Outcome

- Helps to assign various plants to their respective families
- Understand the floral and morphological characters of various families
- Helps to know the permanent herbarium preparation techniques
- Improve the knowledge about the plant identification
- Identify the key preparations of families, Genus and species
- Provide knowledge about ethnobotanical studies of in and around areas.

Practical Syllabus:

- 1) Preparation of minimum 20 Herbaria.
- 2) A field trip to a floristically rich area to study plants in nature.
- 4) Field survey for of local flora in College Campus.
- 5) Study of locally available plants as per the theory syllabus.
- 6) Field Study: Plant collection Tour of Minimum Two days and submissions of evaluation report during practical examination.

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Semester – V**

CORE- XI

LAB IN PLANT PHYSIOLOGY AND CELL BIOLOGY - 14UBYC5Q

Duration: 45

Hours

Credits – 3

Objectives:

- To study the plant osmosis and permeability techniques.
- To study and observe the various stages of cell division in mitotic technique.

Course outcomes

- Acquire the basic skills of Plant Physiology
- Learning the adaptive features of plant growing in various habitats
- Describe the chromatographic techniques
- Learning the cell division techniques.
- Define photosynthesis respiration systems of plants
- Gain thorough knowledge to observe the various cell organelles

Plant Physiology

1. Determination of Osmotic Pressure of Rhoeo leaf plasmolytic method.
2. Effect of temperature and chemicals on membrane permeability.
3. Determination of water absorption and transpiration ratio of twigs.
4. Effect of light intensity on transpiration using Ganong's Potometer.
5. Separation of plant pigments by paper chromatography.
6. Effect of intensity of light on O₂ evolution during photosynthesis using Wilmott's bubbler.
7. Measurement of rate of respiration in germinating seeds/flower buds using simple Respiroscope.
8. Measurement of RQ by Ganong's respirometer.

Demonstration Experiments

1. Potato Osmoscope.
2. Anaerobic respiration.
3. Geotropism
4. Fermentation-khune's
5. Ganong's light screen

CELL BIOLOGY

1. Study of mitosis by squash technique.
2. Microscopy- Theoretical knowledge of Light and Electron microscope.
3. Study of cell organelles through photo micrographs
4. Histochemical localization of lipids

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI

Choice Based Credit System

U.G Programme- B.Sc., Botany (2014-2017)

Semester – V

Duration: 60 Hours

Credits- 3

OPTIONAL/ELECTIVE COURSE –II:

BIODIVERSITY AND CONSRVATION- 14UBYO51

Objectives:

- To provide a thorough knowledge Plant diversity.
- To understand the importance of Biodiversity and Bioresources.

Course outcomes

- Provide a thorough knowledge on Plant diversity.
- Helps to study the ecological adaptations of plants
- Explain the concept of biodiversity and conservation strategies
- Understand the importance of Biodiversity and Bioresources.
- Gain understanding on the biodiversity hotspots of the world and India
- Learn the conservation of threatened plants.

UNIT I (12 Hours)

Biodiversity - definition – Importance and patterns of biodiversity: α , β and γ diversity, Genetic diversity, Species diversity.

UNIT II (12 Hours)

Endemism and Biodiversity, Categories of endemics, Species richness and species index, species richness, rarity and abundance, Agro biodiversity.

UNIT III (12 Hours)

Biodiversity hot spots - indicator species - keystone species. IUCN categories of extinction - red data book - Causes for species extinction. Biodiversity loss- habitat destruction and fragmentation, Over exploitation of natural resources, population explosion and hunting.

UNIT IV (12 Hours)

Intellectual property right (IPR) and Intellectual property protection (IPP), Trade related Intellectual property right (TRIPS), General agreement on tariffs and trade (GATT), Biopiracy, Bioprospecting.

UNIT V (12 Hours)

Conservation: *In situ* Conservation - Biosphere reserve - National Parks - Wild life sanctuaries- on farm conservation - Community gardens, home gardens- *Ex situ* conservation, Cryopreservation, Germplasm conservation, gene bank, seed bank, pollen bank, tissue culture, community gene bank; Ecotourism. Organization involved in conservation activities of NBPGR, BSI, MoEF.

TEXT BOOKS

1. Sharma P.D, Elements of Ecology, Rostogi Publication, Meerat.
2. Odum, E.P. – Fundamentals of Ecology, Saunder co, London.
3. Kumar H.D. – Modern concept of Ecology, Vikas publishing house, New Delhi.

REFERENCES

1. Meffe, G.K. and Carrol, R.C. 1994. Principles of Conservation Biology. Sinauer Associates, Inc., Publishers, Saunders.
2. Melchias, G. 2001. Biodiversity and Conservation. Oxford and IBH publishing company Pvt, Ltd, New Delhi.

3.Praboth K. Maiti and Paulami Maiti .(2011). Biodiversity Perception, Peril and Preservation. PHI Learning Pvt, New Delhi.

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Choice Based Credit System

U.G Programme- B.Sc., Botany (2014-2017)

Semester – V

Duration: 60 Hours

OPTIONAL/ELECTIVE COURSE - II:

Credits- 3

ETHNOBOTANY AND BIORESOURCES - 14UBYO52

Objective:

- To provide a thorough knowledge Ethanomedicinal plants.
- To provide the sufficient knowledge on Indigenous system of medicine.
- To understand the basic knowledge of Traditional system of medicine.

Course outcomes

- Provide a thorough knowledge of Ethanomedicinal plants.
- Provide sufficient knowledge on Indigenous system of medicine.
- Understand the basic knowledge of Traditional system of medicine.
- Documented the wild edible and medicinal plants species of the local areas
- Acquaint with various types tribes and there life system.
- Learning the different western medicinal systems of India.

UNIT I (12 Hours)

Ethanobotany: Introduction, concept, scope and objectives, History of traditional medicines and Ethanomedicine – definition, history and its scope – Inter disciplinary approaches in ethnobotany – Collection of ethnobotanical data from ethnic group in Tamil Nadu.

UNIT II (12 Hours)

Importance of medicinal plants – Sacred groves, role in human health care, The relevance of ethnobotany in the present context, Methodology of Ethnobotanical studies: a) Field work b) Herbarium c) Ancient Literature d) Archaeological findings e) temples and sacred places.

UNIT III (12 Hours)

Medico-ethnobotanical sources in India. Traditional knowledge and utility of some medicinal plants in Tamilnadu- *Centella asiatica*, *Solanum trilobatum*, *Cassia auriculata*, *Solanum trilobatum*, *Cardiospermum halicacabum*, *Vitex negundo*, *Adathoda vasica*, *Eclipta alba*, *Aristolochia indica*.

UNIT IV (12 Hours)

Plants used by the tribals: a) Food plants b) intoxicants (*Tricopus zylanicus* and Cassava) and beverages c) Resins and oils and miscellaneous uses. Pharmaceutical importance of Glycosides, Alkaloids, Phenolics, Steroids, Volatile oils and Resins, Intellectual Property Rights and Traditional Knowledge.

UNIT V (12 Hours)

Methods of extraction, solvent system for isolation and characterization of plant secondary metabolites. Intellectual Property Rights and Traditional Knowledge.

TEXT BOOKS

1. Gokhale, S.S., C.K.Kokate and A.P. Purohit (1994) Pharmacognosy. Nirali Prakashan. Pune.
2. Tyagi, Dinesh Kumar (2005) Pharma Forestry. Field Guide to Medicinal Plants. Atlantic Publishers and Distributors, New Delhi.
3. Faroogi, A.A., and B.S. Sreeramu (2004). Cultivation of Medicinal and Aromatic Crops. University Press (India) Pvt. Ltd., Hyderabad.

REFERENCES

1. Tribal medicine – D.C. Pal & S.K. Jain 1998, Naya Prakash, 206, Bidhan Sarani, Calcutta – 700 006.

2. Contribution to Indian ethnobotany – S.K. Jain 1995, 3rd edition, Scientific publishers, P.B.No. 91, Jodhpur, India.
3. A Manual of Ethnobotany – S.K.Jain, 1995, 2nd edition.
4. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI
Choice Based Credit System
U.G Programme- B.Sc., Botany (2015-2018)
Semester – V

Duration: 30 Hours
Credits- 2

SKILL BASED COURSE –II:
BIOLOGICAL TECHNIQUES AND BIOSTATISTICS - 15UBYS51

Objectives:

- To provide a thorough knowledge on techniques in plant biology.
- To understand the basics importance of Biochemistry.

Course outcomes

- Learn the different types of microscopes and their uses of biological science laboratories.
- Identify the methods of mounting media and slide preparations
- Explain the sectioning processors of the rotary microtome and their uses.
- Understand the principle, Applications and different methods of chromatography.
- Exposure to the basic principles of different techniques.
- Improve the knowledge of data collection and Biostatistics methods.

UNIT I (6 Hours)

Fixation and Fixatives, Dehydration, infiltration, embedding, sectioning by rotary microtome. Mounting media, Double staining method- Safranin and fast green.

UNIT II (6 Hours)

Methods of mounting - smear, squash and maceration (Jeffrey's method). Whole mount of delegate material. Histochemical localization of carbohydrates (PAS), Proteins (Bromophenol blue)

UNIT III (6 Hours)

Principles and uses of Camera lucida, Micrometry, UV/VIS Spectrophotometry, Infrared spectroscopy, Atomic absorption spectroscopy.

UNIT IV (6 Hours)

Chromatography- paper, thin layer, gas chromatography, HPLC.

UNIT V(6 Hours)

Data Collection- Formation of frequency distribution, Mean, Median and Mode, Variations, standard deviation, standard error, Chi - square test. Basic concept of probability

TEXT BOOKS

1. Johanson D.A 1940, Plant Microtechniques Tata McGraw Hill.
2. Sase John E 1964, Botanical Microtechnique, oxford 7 Ibh.
3. Gray P 1964, Hand Book of Basic Microtechniques, McGraw Hill.
4. Sinha and Sunitha Sinha 1985, Cytogenetics, Plant Breeding and Evolution, Vani Educational Books.

REFERENCES

1. Alan Peacock H 1966, Elementary Microtechnique; Edward Arnold Publishers Ltd.
2. Duddington C.L. 1960, Practical Microscopy, Pitman.
3. McCluney C.L 1961, Hand Book of Microscopical Technique, Wafner.
4. Rangaswami R.A 1995, A Text Book of Agricultural Statistics. New Age International Publications.

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI

**Choice Based Credit System
U.G Programme- B.Sc., Botany (2015-2018)
Semester – V**

**Duration: 30 Hours
Credits- 2**

**SKILL BASED COURSE –III:
FOREST BOTANY- 15UBYS52**

Objectives:

- To enable the students to understand the importance and value of forest and its products
- To accelerate the awareness on conservation and sustainable utilization of forest and its resources.
- To understand the ecological relationship, hydrological cycle and vegetation dynamics of forest.

Course outcomes:

- Understand the importance and value of forest and its products
- Create awareness on conservation and sustainable utilization of forest and its resources.
- Understand the ecological relationship, hydrological cycle and vegetation dynamics of forest.
- Learn various ecosystems of forest
- Understand the Keystone species of wild life
- Helps to study various products of forest

Unit: I (6 Hours)

General introduction to forest. Classification of world forest and Indian forests, tropical, temperate, monoculture, forest climate.

Unit: II (6 Hours)

Forest and biodiversity, Forest ecosystem, Hydrological cycle. preservation of natural forestry and pollution control

Unit: III (6 Hours)

Forest policies forest protection through people, forest physiology forest ecology. Major and minor forest products. Use and misuse of forest by man, direct and indirect forest wealth:

Unit: IV (6 Hours)

Silviculture: concept and scope, outline of seed dynamics in forest seed production, dissemination, germination, establishment and mortality, forest research organizations, importance of forest research.

Unit V (6 Hours)

Forest and wild life: floristic and faunastic wealth of India. National policies on wild life production; Keystone species importance of wild life, Forestry for social and national development.

TEXT BOOKS

1. Principle of silviculture, Fredrick S. Backer, Mcgraw Hill Book co. NY, 1950.
2. Forest menturation, Donald bruseand Grancis X. Schumacher , Mcgraw Hill Book co. NY, 1950.
3. Multipurpose tree germplasm , Ed, Burley S and von carlowitiz P. International council for research in agroforestry, Nairobi, 1984.

REFERENCES

1. Forest Ecology J.B.Lal Media : Hard Back, 1992
2. Forestry and Rural Development - Planning and Management Dr. A.Arul Ghana Sekar, 2001.
3. Tropical forests, Ed. Holm –Neilsen .DC and balselv II academic pree, London, 1989.

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI
Choice Based Credit System
U.G Programme- B.Sc., Botany (2015-2018)
Semester – VI

Duration: 75 Hours
Credits- 5

CORE- XII - PLANT ECOLOGY AND PHYTOGEOGRAPHY- 15UBYC61

Objectives:

- To provide a thorough knowledge about environmental biology and ecosystem.
- To provide the sufficient knowledge on Phytogeography.

Course outcomes

- Provide a thorough knowledge about environmental biology and ecosystem.
- Provide sufficient knowledge on phytogeography.
- Understand the Approaches to Phytogeography – Climate of India & its climatic zones
- Gain an appreciation of Earth's geological history and understand the role of historical biogeography in interpreting plant distributions
- Gain knowledge about the environmental pollution and causes of pollutions
- Investigate the relationship between systematic and biogeography (phylogeography)
- Provide knowledge about Vegetation types

UNIT I (15 Hours)

Principles and Scope of Ecology, Plant environment - climatic, edaphic and biotic factors – Primary productivity and its measurements, Biogeochemical cycle- C, N, P.

UNIT II (15 Hours)

Ecosystem: concept, structure and functions of ecosystem, components of ecosystem- Biotic and abiotic – energy flow in ecosystem - grassland, pond, food chain, food web, ecological pyramids, ecological niche.

UNIT III (15 Hours)

Vegetation - Units of vegetation formation, Ecological succession- stages of succession, monochlimax and polyclimax theories of succession. Plant succession Hydrosere, xerosere

UNIT IV (15 Hours)

Environmental pollution – Types and causes of pollution – Effects and control measures of Air pollution, water pollution, soil pollution, thermal pollution, Noise pollution and radioactive pollution.

UNIT V (15 Hours)

Principles of Phytogeography- Climatic zone- Factors affecting the distributions of species phytogeography, Vegetation in Tamil Nadu, evergreen forest, deciduous forest, scrub forest & mangroves forest.

TEXT BOOKS

1. Sharma, P.D,1989. – Elements of Ecology, Rastogi Publication, Meerut.
2. Kumar, H.D, 1978. – Modern concepts of ecology, Vikas publishing house, New Delhi.
3. R.S. Shukla and P.S. Chandel Plant ecology and soil science ,chanda and company Ltd., 1998.

REFERENCES

1. Odum, E.P., 1959. Fundamental of Ecology, W.B. Saunder Colondon.
2. Ambast, R.S, 1969. – A text book of Plant Ecology, Students Friends & C.Varanashi
3. Bhatia and Sharma, 2005. – A treatise on Plant Ecology, Pradeep Publication, Jalendhur.

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI
Choice Based Credit System
U.G Programme- B.Sc., Botany (2015-2018)
Semester – VI

Duration: 60 Hours
Credits- 4

CORE- XIII -GENETICS – 15UBYC62

Objectives:

- To study the principles of Mendelian genetics
- To gain knowledge about mutation and population genetics.

Course outcomes

- Gain understanding on the principles and concept of Mendelian law
- Gain knowledge about mutation and population genetics
- Understand basic structure and function of DNA and chromosomes
- Provide sufficient knowledge of hybridization and concepts of genetics
- Understand the concept of genetic recombination's at molecular level
- Gain insight in the origins of the human species.

UNIT I (12 Hours)

Introduction to Genetics - Mendel's work, Terminology, Monohybrid and Dihybrid cross- Mendelian laws- Back/test cross. Complete and Incomplete Dominance. Incomplete dominance. lethal factor, complementary factor and dominant and recessive epistasis,

UNIT II (12 Hours)

Allelic gene interaction- Multiple alleles -ABO Blood group inheritance. Linkage, crossing over, mapping of genes on chromosomes, sex linkage, cytoplasmic inheritance (plastid inheritance in *Mirabilis jalapa*, male sterility in corn).

UNIT III (12 Hours)

Sex determination in plants, changes in chromosome structure. Characteristics of Genetic code- Codon and anticodon - Wobble hypothesis.

UNIT IV (12 Hours)

Mutations Chromosomal aberrations: Deletion, Duplication, Inversion, Translocation, Aneuploidy and Polyploidy; Gene mutations: Induced versus Spontaneous mutations, Molecular basis of Mutations in relation to UV light and chemical mutagens.

UNIT V (12 Hours)

Population genetics- gene pool concept, Hardy – Weinburg law- gene frequencies calculation and factors affecting Hardy – Weinburg law-

Text books

1. Verma P.S and V.K Agarwal 1991. S.Chand &Co, New Delhi.
2. Gupta, P.K 2002. Genetics. Rastogi Publishers, Meerut.
3. Meyyan, R.P. 2000 – Genetics – Saras Publication, Nagercoil
4. Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008). VIII ed. Principles of Genetics.Wiley India.

REFERENCES

5. Russell, P. J. (2009). Genetics- A Molecular Approach. III Edition. Benjamin Cummings.
6. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
7. Pevsner, J. (2009). Bioinformatics and Functional Genomics.II Edition.John Wiley & Sons.
8. Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. IX Edition. Introduction to Genetic Analysis. W. H. Freeman and Co.
9. Gupta, P.K. 2000 – Genetics – Rastogi Publication Meerut.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
Choice Based Credit System
UG Programme - B.Sc., Botany (2015-2018)
SEMESTER - VI

CORE-XIV

Duration: 75 hours
Credits: 4

MICROBIOLOGY -15UBYC63

Objectives:

- To enable students to understand the diversity of microbes and importance of classification of microorganisms
- To help the students to understand the influence of microorganisms and microbiological applications on everyday life.

Course outcomes

- Understand the basic knowledge of microbiology and types of microbes, classification & characterization.
- Studied the history of microbiology and its applications
- Describe the classification of bacteria
- Explain the different types of viruses and plant diseases
- Provide the sufficient knowledge about the types of symptoms and their causative agents of diseases.
Understand the diversity of microbes and importance of classification of microorganisms.

UNIT I (12 Hours)

Early development of microbiology- contributions of Anton Van Leeuwenhoek, Louis Pasteur and Robert Koch and his postulates. Principles and working mechanism of compound microscope, phase contrast microscopes, and Electron microscopes-TEM, SEM.

UNIT II (12 Hours)

Classification of microbes-Bacteria, (*upto* the order level with one example), Whittaker five kingdom concept, Virus classification (up to family with one example). General structure of Bacteria – Ultra structure and Life cycle of bacteria.

UNIT III (12 Hours)

Soil and Agricultural improvement; Soil microbes and their roles- Adaptation and interaction. Improvements of Soil fertility- Nitrogen fixing bacteria and their role in Nitrogen Cycle- Phosphate Solubilization. Microbes as biofertilizer and Biopesticides. Mycorrhizae.

UNIT IV (12 Hours)

Soil habitats (Lithosphere), microbial biochemical cycling, microbial test for the detection of soil fertility- Soil enzymes. Environment of soil microorganism, contribution of soil microorganisms to soil. Microorganism and formation of different soils. Rhizosphere and *Rhizobium*.

UNIT V (12 Hours)

Biodeterioration- Microbial Biodeterioration of agricultural products. Microbial pesticides, Microbial insecticides, microbial nematicides, microbial herbicides.

TEXTBOOKS

1. Prescott L.M., J.P. Harley and D.A. Klein, (2005) Microbiology, Sixth edition McGraw Hill, Boston.
2. Pelzer M.J., E.C.S. Chan and N.R. Kreig, (1993) Microbiology, McGraw Hill Inc., New York.

3. Ananthanarayanan and J.Panicker. (2005) Text book of Microbiology, Eighth edition, Orient Long Publishers.
4. Alef, Kassem, and Paolo Nannipieri. *Methods in applied soil microbiology and biochemistry*. Academic press, 1995.

References:

1. Michael T. Madigan John M. Martin & Jack Parker. (1984) Biology of Microorganisms, Prentice Hall International, Inc., London.
2. Gerard J. Tortora, Berdell R. Funke, Christine & L. Case. (2001) Microbiology - An Introduction, Benjamin Cummings, U.S.A.
3. Danial Lim. (1998) Microbiology, McGraw-Hill Companies , New York.

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI

Choice based credit system

U.G Programme- B.Sc. Botany (2014-2017)

Semester – VI

Duration: 45 Hours

Credits- 3

CORE-XV: LAB IN PLANT ECOLOGY AND PHYTOGEOGRAPHY AND GENETICS- 14UBYC6P

Objectives:

- To Study of the morphological and structural adaptations and their habitats.
- To enrich the knowledge of Field study about Transect and Quadrant methods.

Course outcomes

- Identify the adaptive features of plant growing in various habitats
- Understand the principal concepts of biodiversity
- Provide sufficient knowledge about different vegetations of ecosystem
- Helps to work out problems on Monohybrid and Dihybrid ratios
- Enable learning the cell division methods mitosis
- Describe the transaction methods and species richness

Phytogeography

Field visit to nearby Western Ghats to observe the vegetation.

Genetics

1. Problems of monohybrid and dihybrid ratios
2. Test cross, Incomplete dominance and Interaction of genes
3. Chi-square and probability.
4. Spotters related to syllabus

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI

Choice Based Credit System

U.G Programme- B.Sc. Botany (2014-2017)

Semester – VI

CORE- XVI LAB IN MICROBIOLOGY -14UBYC6Q

Duration: 45 Hours

Credits: 3

Objectives:

- To enable the students acquire the knowledge about basic technical skills in microbiology lab.
- To enable the students in the culturing, identification and maintenance of microbes

Course outcomes:

- Demonstrate safe practices in a microbiology laboratory
 - Acquire knowledge about basic skills in microbiology techniques
 - Enabling in culturing, identification and maintenance of microbes
 - Enrich knowledge and skills in identifying the museum specimens
 - Understand and explain environmental factors that influence microbes
 - Understand the staining methods and slide preparations
1. Microbiological Techniques-Media preparation, sterilization techniques, streaking techniques.
 2. Isolation of Microorganisms from soil, water, air by spread plate and pour plate methods.
 3. Staining Techniques - Gram staining
Endospore staining
 4. Biochemical tests- IMVIC tests
Starch hydrolysis
Catalase test
Oxidase test
Acid and gas production test
 5. Test of microorganisms for enzymes –protease and amylase.
 6. Water quality analysis by MPN method
 7. Isolation of Rhizobium and Mycorrhizae

References:

1. Ronald M. Atlas *et al.*, (1997), Experimental Microbiology, Benjamin and Cummings Publication.
2. J.G. Cappuccino and N. Sherman, (2002), Microbiology: A Laboratory Manual Addison-Wesley.
3. Kannan.N., (1995), Lab manual in Microbiology Panima publishers, New Delhi..
4. J.G.Holt, N.R.Krieg, (2000), Ninth edition, Bergey's Manual of Determinative Bacteriology,

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI
Choice Based Credit System
U.G Programme- B.Sc., Botany (2014-2017)
Semester – VI

Duration: 60 Hours
Credits- 3

Optional/Elective Course-III

PALYNOLOGY AND POLLINATION BIOLOGY- 14UBYO61

Objectives:

- To learn about Palynology.
- To provide the knowledge on Pollination in plants.

Course outcomes:

- Learning about Palynology.
- Provide the knowledge on Pollination in plants.
- Understand the sexual incompatibility in plants.
- Familiar with embryonic processes
- Understand the various pollinations periods
- Explain the seeds dispersal mode of plants.

UNIT I (12 Hours)

Palynology - Form of pollen grains, Pollen wall structure, palynogram, NPC system, types of pollen grains, development of pollen wall pattern, pollen development, cell biology of pollen grains, pollen kit, pollen calendar, circadian rhythms of pollen emission, pollen and allergy and application of palynology.

UNIT II (12 Hours)

Pollination Biology- Sexual incompatibility- Homomorphic system- gametophytic self incompatibility, sporophytic incompatibility- Heteromorphic system- distyly and tristly

UNIT III (12 Hours)

Physiology and biochemistry of incompatibility- recognition reaction, rejection reaction, and stigma surface inhibition, stylar inhibition. Biological significance of incompatibility and significance of incompatibility in plant breeding.

UNIT IV (12 Hours)

Various methods to overcome the self incompatibility- mixed, bud, stub, end-of-season pollination, intraovarian and test tube pollination, polyploidy, irradiation, heat and chemical treatment and parasexual hybridization.

UNIT V (12 Hours)

Apomixis and its types- Agamospermy, diplospory, apospory, adventive embryony. Polyembryony and its practical application

TEXT BOOKS

1. Bhojwani, S.S and Bhatnagar, S.P- The embryology of angiosperms, 1974 Vikas publication house, New delhi
2. Maheswari, P- An introduction to the embryology of angiosperms, 1971 TMH limited New Delhi
3. Chopra, G.L- Angiosperms, 1988- Pradeep publications, Jalandar

REFERENCES

1. Shivanna, K.R and Johri, B.M- The angiosperm pollen –Wiley publication.
2. A Text book of Palynology by Kashinath Bhattacharya, New Central Book Agency; 3rd Revised edition edition 2011
3. Pollination Biology, Yogesh Dabgar, Neha Publishers & Distributors, 2011

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI
Choice Based Credit System
U.G Programme- B.Sc., Botany (2014-2017)
Semester – VI

Duration: 60 Hours
Credits- 3

OPTIONAL/ELECTIVE COURSE-III
ECONOMIC BOTANY- 14UBYO62

Objectives:

- To learn about economic uses of plants
- To provide the knowledge on Economic importance of plants.

Course outcomes

- Learn economic uses of plants
- Provide knowledge on Economic importance of plants
- Improve knowledge on various plant cultivation techniques
- Developing a framework for exploring the economic uses of plants for food, beverages, textiles, medicine, shelter and fuel.
- Providing with a general background in the basic principles of botany and plant ecology
- Understand the human relationship with plants into the future.

UNIT I (12Hours)

Economic botany- Introduction – Food plants- plant products of industrial value, medicinal plants and drugs, food adjuncts, lower plants in economic botany.

UNIT II (12Hours)

Cereals and millets: Cereals – History and Uses of rice, wheat, maize, barley oat and rey Millets – History and uses of sorghum , pearl millet and Italian millet.

UNIT III (12Hours)

Legumes, Nuts and vegetables- History- uses of soya bean , Black gram red gram green gram . Nuts – History uses of coconut and cashew nut , vegetables sweet potato beet root stem and vegetables- onion cabbage and cauliflower. Fruits- history and uses tomato and Brinjal

UNIT IV (12Hours)

Cultivation and uses and of Mango, citrus, banana, guava Papaya and sapota. Fiber crops- Cotton, Jute, Beverages- Cocoa and coffee. Wood- Sandal, Teak.

UNIT V (12Hours)

Gums and resins: Biological source- Chemical constituents and uses of the following acacia gum Guar gum, Sterculia gum. Resins – Capsicum Asafoetita. Gutta percha

TEXT BOOKS

1. Gupta S.K &Kaushik, M. P .an Introduction to economic botany K. Nathabnd co., Meerut, India, 1973
2. Pandey B.P, Economic botany S Chand and Co., New Delhi, 200
3. Verrma V.A. Text book of economic botany ,EmkayPubliccations , New Delhi, 19741.

REFERENCES

1. H.D. Kumar, Economic Botany, 2003, MacMuth Publications, New Delhi.
2. Dr. V. Singh, Dr. P.C. Pande & Dr. D.K. Jain. 2012, Rastogi Publications, New Delhi.
3. Economic botany, Suresh Kumar, Cumpus Books International2014

Choice Based Credit System
U.G Programme- B.Sc., Botany (2014-2017)
Semester – VI

Duration: 30 Hours
Credit- 2

SKILL BASED COURSE –IV

PLANT BIOTECHNOLOGY - 14UBYS61

Objective:

- To provide a thorough knowledge on techniques in *invitro* plant propagation.
- To understand the Plant Biotechnology.

Course outcomes:

- Provide a thorough knowledge on techniques of *in vitro* plant propagation
- Understand the Plant Biotechnology techniques.
- Provide the knowledge about embryogenesis.
- Learning the various gene transfer techniques
- Learn the preservation methods

UNIT I (6 Hours)

Introduction and importance of plant tissue culture. Plant cell-totipotency- Dedifferentiation-redifferentiation, scope, historical review. Aseptic techniques; Culture media: preparation and composition. Methods of sterilization, inoculation, incubation and hardening.

UNIT II (6 Hours)

Cell and organ differentiation; Clonal propagation or micropropagation, anther culture, Cell suspension culture. Production of plant secondary metabolites, Germplasm storage including cryopreservation, Somaclonal variation and its advantages and disadvantages.

UNIT III (6 Hours)

Somatic embryogenesis, Isolation and purification of protoplasts. Protoplast culture and regeneration of plants; Protoplast fusion and somatic hybridization (Cytoplasmic hybrids or Cybrids)

UNIT IV (6 Hours)

Gene transfer: Ti and Ri plasmids, gene transfer techniques using *Agrobacterium*, Physical delivery methods- Electroporation, particle bombardment, liposome mediated, Gene gun method, Terminator gene technology,

UNIT V (6 Hours)

Transgenic plants for crop improvement: resistance to herbicide, insecticide, virus. Application of transgenic technology, edible vaccine.

TEXT BOOKS

1. Gupta, P.K. 1999. Elements of Biotechnology. Rastogi Publications, Meerut.
2. Ignacimuthu, S.J. 1997. Plant Biotechnology. Oxford and IBH Publishing Company, New Delhi.
3. Kumar H.D. 2001. A TEXTBOOK on Biotechnology. East-west Press, New Delhi.
4. Dubey, R.C. 2002. A TEXTBOOK of Biotechnology. S. Chand and Company, New Delhi.

REFERENCES

1. Bhojwani, S.S. and Razdan, M.K. 1996. Plant Tissue Culture: Theory and Practice. Elsevier Science Publishers, New York, USA.
2. Bhojwani, S.S. 1990. Plant Tissue Culture: Applications and Limitations. Elsevier Science Publisher, New York, USA.
3. Khasim, S.M. 2002. Botanical Microtechnique: Principles and Practice. Capital Publishing Company, New Delhi.
4. Vasil, I.K. and Thorpe, T.A. 1994. Plant Cell and Tissue Culture. Kluwer Academic Press, The Netherlands.

SRI KALISWARI COLLEGE (AUTONOMOUS) SIVAKASI
Choice Based Credit System
U.G Programme- B.Sc., Botany (2014-2017)
Semester – VI

Duration: 30 Hours
sCredits- 2

VALUE BASED COURSE –II
BIOINFORMATICS 14UBYV61

Objectives:

- To provide students with a practical and the theoretical knowledge of DNA sequences, genomes, protein sequences and protein structure information that will prepare them for careers in bioinformatics, academia, industry and research.
- To understand the vast quantities of data generated in the fields of Molecular and Biological Sciences.
- To help students to acquire problem-solving skills and gain experience in understanding, handling and developing important software used in pharmaceutical, chemical and biotechnology industries.

Course outcomes

- Providing practical and the theoretical knowledge of DNA sequences.
- Gain understanding on protein sequences and protein structure of information
- Understand the vast quantities of data generated in the fields of Molecular and Biological Sciences.
- Acquire problem-solving skills and gain experience ins biotechnology industries
- Understanding, handling and developing important software used in pharmaceutical, chemical and biotechnology Techniques.
- Learning to summarize the challenges facing clinical applications in the light of growing research results in genomic medicine and bioinformatics.

UNIT: I (6 hours)

Introduction to Bioinformatics – Definitions, Basic concepts, Scope and Applications of Bioinformatics. Genome Project.

UNIT: II (6 hours)

Biological Databases: Nucleic acid sequence databases – EMBL, GenBank, and DDBJ. Protein Sequence Databases – PIR, Swiss-PROT, Tr-EMBL. Structural Databases – PDB, Pubmed. File formats – GenBank.

UNIT: III (6 hours)

Sequence Alignment: Pair wise Alignment- Definition, Local alignment - BLAST, global alignment - FASTA. Multiple sequence alignment: Definition, Clustal W. Phylogenetic tree: Definitions, Tree constructing Methods: Distance Based Method- the Neighbour joining method.

UNIT: IV (6 hours)

Ligand database. Drug Designing: computer based drug designing, Structure based drug designing. Molecular docking. Pharmacogenomics.

UNIT: V (6 hours)

Protein primary structure Analysis (using EXPASY tools): Amino acid composition analysis, Molecular weight, Hydrophobicity and Hydropathy profiles, helical wheel. Protein secondary structure Prediction - GOR method.

TEXT BOOKS

1. Bioinformatics sequence and genome analysis, David M. Mount (2009), Gold Spring Harbor Press Publishers, England.
2. Introduction to Bioinformatics, Parry Smith and TK Attwood (2001), 8th edition, Pearson education. UK

REFERENCES

3. Instant notes on Bioinformatics, T.K.Westhead, VIVA Publishers. New Delhi.
4. Molecular Modeling, Andrew Leach (2003), 2nd Edition. USA.