VIVEKANANDHA COLLEGE OF
ARTS AND SCIENCES FOR WOMEN
[Autonomous]
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Affiliated to Periyar University, Approved by AICTE and
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Recognized under section 2(f) and 12(B) Under UGC Act, 1956
Elayampalayam - 637 205. Tiruchengode, Namakkal Dt., Tamil Nadu

1.1 Curriculum Design and Development

1.1.2

SYLLABUS REVISION

B. Sc., BOTANY

2017 -18

PG AND RESEARCH DEPARTMENT

OF BOTANY

B.Sc., Botany – Choice Based Credit System
(For the candidates admitted from the Academic year 2017 - 2018 Onwards)

Sem	Part	Course	Code	Title	Inst. Hrs.	Credits	Exam Hrs.	Marks		
								CIA	EA	Total
I	I	Tamil I	17U1LT01	Foundation Tamil I	6	3	3	25	75	100
	II	English I	17U1LE01	Foundation English I	6	3	3	25	75	100
	III	Core Course I	17U1BOC01	Plant diversity –I (Algae, Fungi and Lichens)	6	5	3	25	75	100
		Core Course II (Practical)	17U2BOCP01	Algae, Fungi and Lichens (Examination at the end of II Semester)	3	-	-	-	-	-
		First Allied I	17U1ZOA01	Zoology I	4	4	3	25	75	100
		First Allied II (Practical)	17U2ZOAP01	Zoology	3	-	-	-	-	-
	IV	Value Education	17U1VE01	Yoga	2	2	3	25	75	100
				Total	**30**	**17**	**-**	**125**	**375**	**500**
II	I	Tamil II	17U2LT02	Foundation Tamil II	6	3	3	25	75	100
	II	English II	17U2LE02	Foundation English II	6	3	3	25	75	100
	III	Core Course III	17U2BOC02	Plant diversity – II (Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany)	4	5	3	25	75	100
		Core Course II (Practical)	17U2BOCP01	Cont. From I Semester Comprising Core Course I – Algae, Fungi and Lichens & Core Course III - Bryophytes, Pteridophytes, Gymnosperms and Paleeobotany	3	3	3	40	60	100
		First Allied III	17U2ZOA02	Zoology II	4	4	3	25	75	100
		First Allied II (Practical)	17U2ZOAP01	Allied Zoology practical Cont. From I Semester	3	3	3	40	60	100
	IV	Value Education	17U2ES01	Environmental Studies	4	4	3	25	75	100
				Total	**30**	**25**	**-**	**205**	**495**	**700**

III	I	Tamil III	17U3LT03	Foundation Tamil III	6	3	3	25	75	100
	II	English III	17U3LE03	Foundation English III	6	3	3	25	75	100
	III	Core Course IV	17U3BOC03	Mushroom cultivation Technology	4	5	3	25	75	100
		Core Course V (Practical)	17U3BOCP02	Core Course IV Mushroom cultivation Technology (Examination at the end of IV Semester)	3	-	-	-	-	-
		Second Allied I	17U3CHA01	Chemistry I	4	4	3	25	75	100
		Second Allied II Practical	17U3CHAP01	Chemistry	3	-	-	-	-	-
	IV	SBEC I	17U3BOS01A/B	Elected by students	2	2	3	25	75	100
		NMEC I	17U3ZON01	Sericulture	2	2	3	25	75	100
				Total	**30**	**19**	**-**	**150**	**450**	**600**
IV	I	Tamil IV	17U4LT04	Foundation Tamil IV	6	3	3	25	75	100
	II	English IV	17U4LE04	Foundation English IV	6	3	3	25	75	100
	III	Core Course VI	17U4BOC04	Anatomy, Embryology and Seed Science	4	5	3	25	75	100
		Core Course V (Practical)	17U4BOCP02	Comprising Core Course IV Mushroom cultivation Technology & Core Course VI - Anatomy, Embryology and Seed Science Carried From III Semester	3	3	3	40	60	100
		Second Allied III	17U4CHA02	Chemistry II	4	4	3	25	75	100
		Second Allied II Practical	17U4CHAP01	Chemistry	3	3	3	40	60	100
	IV	SBEC II	17U4BOS02A/B	Elected by students	2	2	3	25	75	100
		NMEC II	17U4ZON02	Apiculture	2	2	3	25	75	100
				Total	**30**	**25**	**-**	**230**	**570**	**800**
V	III	Core Course VII	17U5BOC05	Morphology and Taxonomy of Angiosperms	5	5	3	25	75	100

		Core Course VIII	17U5BOC06	Cell Biology and Genetics	5	5	3	25	75	100
		Core Course IX	17U5BOC07	Plant Ecology, Phytogeography and Conservation Biology	4	5	3	25	75	100
		Core Course X (Practical)	17U6BOCP03	For Core Course VII- Morphology and Taxonomy of Angiosperms (Examination at the end of VI Semester)	3	-	-	-	-	-
		Core Course X (Practical)	17U6BOCP03	For Core Course VIII - Cell Biology and Genetics (Examination at the end of VI Semester)	3	-	-	-	-	-
		Core Course X (Practical)	17U6BOCP03	For Core Course IX - Plant Ecology, Phytogeography and Conservation Biology (Examination at the end of VI Semester)	3	-	-	-	-	-
		Elective I	17U5BOE01A/B	Elected by students	5	3	3	25	75	100
		SBEC III	17U5BOS03A/B	Elected by students	2	2	3	25	75	100
		SBEC IV	17U5BOS04A/B	Elected by students	2	2	3	25	75	100
				Total	**30**	**22**	**-**	**150**	**450**	**600**
VI	III	Core Course XI	17U6BOC08	Plant Physiology and Biochemistry	6	5	3	25	75	100
		Core Course XII	17U6BOPR01	Group project	5	5	3	25	75	100
		Core Course X (Practical)	17U6BOCP03	For Core Course VII- Morphology and Taxonomy of Angiosperms, Core Course VIII- Cell Biology and Genetics.	-	6	3	40	60	100
		Core Course XIII (Practical)	17U6BOCP04	For Core Course XI - Plant Physiology and Biochemistry& Core Course XII - Plant Ecology, Phytogeography and Conservation Biology	6	5	3	40	60	100

	VI	Elective II	17U6BOE02A/B	Elected by students	5	3	3	25	75	100
		Elective III	17U6BOE03A/B	Elected by students	5	3	3	25	75	100
		SBEC V	17U6BOS05A/B	Elected by students	3	2	3	25	75	100
		SBEC VI	17U6BOS06A/B	Elected by students	3	2	3	25	75	100
		Extn. Activities	17U6EX01	-	-	1	-	-	-	-
				Total	**30**	**32**	**-**	**230**	**570**	**800**
Total No. of Hours and Credits					**170**	**140**	**-**	**4000**		

Skill Based Elective Courses:

SBEC – I – Economic Botany/Biodiversity Conservation

SBEC – II – Fundamentals of Microbiology and Plant Pathology/Post Harvest Technology of Crops

SBEC – III – Horticulture and Nursery Management/Silviculture

SBEC – IV – Forest Botany/Fundamentals of Computer Application

SBEC – V – Biofertilizers/Organic Farming

SBEC – VI – Herbal Home Remedies/Green House Technology

Elective Courses:

Elective – I – Plant Breeding and Evolution/Intellectual Property Rights

Elective – II – Ethnobotany, Medicinal Plants and their Utilization/Analytical Techniques in Plant Science

Elective – III – Plant Biotechnology, Microscopy and Microtechniques/Bioinformatics

B. Sc., Botany **Deletion**

For Students Admitted from the academic year 2014 – 2015

Semester I - Core Course I (Paper Code: 14U1BOC01)

Plant Diversity-I (Algae, Fungi and Lichens)

Max. Marks: 75

Credits: 5

Total hrs: 60

Objectives:

- To study about the general characters, Classification and Economic importance of Algae.
- To understand the structure, reproduction and life cycle of some important algal genera.
- To study about the general characters, Classification and Economic importance of Fungi.
- To understand the structure, reproduction and life cycle of some important fungal genera.
- To study about the general characters, structure and Economic importance of Lichen.

Algae

Unit - I **(12 hrs)**

General Characters (Cyanophyceae, Chlorophyceae, Phaeophyceae and Rhodophyceae) structure, organisation, reproduction, life history and Classification of algae by F. E. Fritsch (1935). Economic importance of Algae – Source and uses of Agar agar, Carrageenin, SCP, Chlorellin and Diatomite. Algae and sewage disposal. Algae as food and fodder. Algae as indicators of pollution.

Unit -II **(12 hrs)**

A detailed study on the structure, reproduction and lifecycle of the following genera; *Oscillatoria, Chlamydomonas, Chara, Caulerpa , Sargassum* and *Polysiphonia*.

Fungi

Unit - III **(12 hrs)**

Fungi - Classification (Alexopoules and Mims 1979). A systematic study of the range of structure, reproduction, life cycles, Economic importance of fungi.

Unit- IV (14 hrs)

A study of the occurrence, structure, reproduction and life cycle of the following genera – *Albugo, Saccharomyces, Peziza, Puccinia* and *Cercospora.*

Unit- V

Lichen (10 hrs)

General characters – Occurrence, classification, structure, reproduction and economic importance of lichens.

Text Books:

1. Text book of Algae. 2015, K. S. Bilgrami and L. C. Saha, Ist Edition, CBS Publishers.

Reference Books:

1. Vashishta B. R. A. K. Sinha. 2010. Botany for Degree student – Fungi. S. Chand & Co. New Delhi.

2. C. J. Alexopoulos, C. W. Mims, M. Blackwell. 2007. Introductory mycology. John Wiley.

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B.Sc., Botany **Addition**

For Students Admitted from the academic year 2017 – 2018

Semester I - Core Course I (Paper Code: 17U1BOC01)

Plant Diversity-I (Algae, Fungi and Lichens)

Credits: 5
Total hrs.: 60

Aim:

- To enable students to understand the diversity of lower group non flowering plants.

Objectives:

- To study the general characters, classification and economic importance of algae, fungi and lichens.

Algae

Unit- I **(12 hrs)**

General characters, thallus organisation, reproduction and life cycle patterns of algae. Outline of classification of algae by F. E. Fritsch (1935). Economic importance of algae. Algae as indicators of pollution. **3%**

Unit -II **(16 hrs)**

Study on the thallus structure, reproduction and life cycle of the following genera: *Oscillatoria, Chlamydomonas, Oedogonium, Caulerpa, Sargassum* and *Polysiphonia*. **3%**

Fungi

Unit -III **(10 hrs)**

Outline of classification of fungi by Alexopoulos and Mims, 1979. A systematic study of the range of structure, reproduction, life cycles and economic importance of fungi.

Unit- IV **(17 hrs)**

A study of the occurrence, structure, reproduction and life cycle of the following genera – *Albugo, Saccharomyces, Peziza, Puccinia* and *Cercospora.*

Unit- V

Lichens **(8 hrs)**

General characters, occurrence, classification, structure, reproduction and economic importance of lichens.

Learning outcome:

- Acquiring knowledge on the algal, fungal and lichen diversity.

Text Books

1. Text Book of Algae. 2015. K. S. Bilgrami and L. C. Saha. Ist Edition, CBS Publishers, New Delhi.
2. Text Book of Algae. 2011. O. P. Sharma. Tata McGraw-Hill Publications, New Delhi.
3. *Advances in Mycology. 2012. Sohan Sharma.* Random Publications Publishers and Distributors, New Delhi.
4. A Text Book of Algae. 1976. Kumar H. D. and Singh H. N. East West Press Private Limited, New Delhi.
5. Lichens - A Preliminary Text Book. 1970. Mishra A. and Agarwal R. P. Oxford and IBH Publishing Company, Mumbai.
6. An Introduction to Fungi. 1970. Srivastava J. P. Central book Depot, Allahabad.
7. A Text Book of Fungi, Bacteria and Viruses. 1978. Dubey H. C. Vikas Publishing House Private Limited, New Delhi.

Reference Book

1. Introductory Mycology. 2007. C. J. Alexopoulos, C. W. Mims, M. Blackwell. John Wiley, New York.
2. Botany for Degree student – Algae. 2010. Vashishta B. R. and A. K. Sinha, V. P. Singh. S. Chand and Company, New Delhi.

Allied Botany – I - CBCS Pattern

Deletion

For Students Admitted from the academic year 2014 – 2015

Semester II – First Allied Course II (Paper Code – 14U1BOA02)

Thallophyta, Bryophyta, Pteridophyta, Gymnospermae, Physiology and Ecology.

Credits: 4

Total hrs: 60

Objectives:

- To study about the general characters, Classification and Life cycle of Algae.
- To study about the general characters, Classification and Life cycle of Fungi.
- To study the morphology, internal structure, reproduction and life cycle of *Funaria, Lycopodium* amd *Cycas*.
- To understand the osmosis, water absorption, Photosynthesis and Photoperidism.
- To understand the Plant Ecology.

Unit I (12 hrs)

Thallophyta: Algae- general characters of algae. A study on the structure and life cycle of the following genera- *Oscillatoria, Oedogonium* and *Polysiphonia*.

Unit II (12 hrs)

Fungi; General characters. A study on the structure and life cycle of the following genera- *Albugo, Penicillium and Agaricus*. Economic importance of Fungi.

Unit III (12 hrs)

Bryophyte, Pteridophyte and Gymnospermae.

A study on the structure and life cycle of the following genera- *Funaria, Lycopodium* and *Cycas*.

Unit IV (12 hrs)

Plant physiology; Osmosis. Absorption of water, Photosynthesis – Light reaction – Calvin cycle. Plant Movements - Photoperiodism.

Unit V (12 hrs)

Plant ecology; Factors affecting vegetation – Climatic factor, Morphological and Anatomical adaptations in hydrophytes, xerophytes and Mesophytes.

Text Books:

1. Text book of Algae. 2015, K.S.Bilgrami and L. C. Saha, Ist Edition, CBS Publishers.
2. Algae O. P. Sharma 2011,Tata McGraw-Hill Education.
3. *Advances In Mycology, 2012Sohan Sharma.* , Random Publications Publishers and Distributors, New Delhi.
4. B.P. Pandey 2011, A Textbook of Botany: Angiosperms - Taxonomy, Anatomy, Embryology and Economic Botany, S. Chand Limited
5. Pandey, B. P. 1986. Text book of Botany, Vol. I & II. S. Chand & Co. New Delhi.
6. Fuller, H. J. and Tippo, O. 1949. College Botany, Henry Holt & Company.
7. Ganguly, A. K. 1975. General Botany Vol. I (1971) and Vol. II. The new book stall, Calcutta.

References:

1. Vashishta B. R. A. K. Sinha. 2010. Botany for Degree student – Fungi. S. Chand & Co. New Delhi.
2. Panday.S.N., Misra. S.P and Trivethi P.S. 2009, A text book of Botany, Volume II , Vikas Publishing House Pvt. Ltd., Delhi.
3. Rao, K. N., Krishnamoorthy, K. V. and Rao, G. S. 1979. Ancillary Botany. S. VisvanathanPvt, Madras.

Allied Botany – I - CBCS Pattern **Addition**

For Students Admitted from the academic year 2017 – 2018

Semester I – First Allied Paper - I (Paper Code – 17U1BOA01)

Thallophyta, Bryophyta, Pteridophyta, Gymnosperms, Plant Physiology and Plant Ecology

Credits: 4

Total hrs.: 60

Aim:

- To enable students to understand the diversity of plants, plant physiology and plant ecology.

Objectives:

- To study the general characters, thallus structure, reproduction and life cycle of algae and fungi.
- To study the morphology, internal structure, reproduction and life cycle of *Marchantia*, *Lycopodium* and *Cycas*.
- To study the absorption of water, photosynthesis and respiration.
- To study the climatic factors, morphological and anatomical adaptations of hydrophytes and xerophytes.

Unit I **(12 hrs)**

Thallophyta:

Algae - General characters. Study on the thallus structure, reproduction and life cycle of the following genera- *Oscillatoria*, *Oedogonium* and *Polysiphonia*.

Unit II **(12 hrs)**

Fungi - General characters. Study on the thallus structure, reproduction and life cycle of the following genera- *Albugo, Penicillium and Agaricus*. Economic importance of Fungi.

Unit III

Bryophytes, Pteridophytes and Gymnosperms **(12 hrs)**

Study on the morphology, internal structure, reproduction and life cycle of the following genera- *Marchantia*, *Lycopodium* and *Cycas*. **6%**

Unit IV **(12 hrs)**

Plant physiology:

Absorption of water (Active and Passive. Photosynthesis – Light reaction (Cyclic and Non-cyclic phosphorylation) and Calvin cycle. Respiration – Aerobic – Glycolysis and Kreb's cycle. **10%**

Unit V **(12 hrs)**

Plant ecology:

Climatic factors. Morphological and anatomical adaptations in hydrophytes and xerophytes. **5%**

Learning outcome:

- Acquiring knowledge on the plant diversity, plant physiology and plant ecology.

Text Books:

1) Text book of Algae. 2015. K. S. Bilgrami and L. C. Saha, Ist Edition, CBS Publishers.
2) Algae O. P. Sharma. 2011. Tata McGraw-Hill Education.
3) *Advances in Mycology, 2012. Sohan Sharma.* , Random Publications Publishers and Distributors, New Delhi.
4) B. P. Pandey. 2011. A Textbook of Botany: Angiosperms - Taxonomy, Anatomy, Embryology and Economic Botany, S. Chand Limited
5) Pandey, B. P. 1986. Text book of Botany, Vol. I & II. S. Chand & Co. New Delhi.
6) Fuller, H. J. and Tippo. O. 1949. College Botany, Henry Holt & Company.
7) Ganguly, A. K. 1975. General Botany Vol. I (1971) and Vol. II. The new book stall, Calcutta.

References:

1) Vashishta B. R. A. K. Sinha. 2010. Botany for Degree student – Fungi. S. Chand & Co. New Delhi.
2) Pandey. S. N., Mishra. S. P. and Trivedi, P. S. 2009. A text book of Botany, Volume II, Vikas Publishing House Pvt. Ltd., Delhi.
3) Rao, K. N., Krishnamoorthy, K. V. and Rao, G. S. 1979. Ancillary Botany. S. Visvanathan Pvt., Chennai.

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Allied Botany –I - CBCS Pattern

Deletion

For Students Admitted from the academic year 2014 – 2015

Semester I – First Allied Course I (Paper Code – 14U1BOA01)

Morphology, Taxonomy of Angiosperms, Cytology, Genetics, Anatomy and Embryology of Angiosperms.

Credits: 3

Total hrs: 60

Objectives:

- To understand the external morphology of angiosperms.
- To study the some important angiosperm families.
- To study above the cell organelles and functions.
- To understands the plant tissues and internal structure of angiosperms.
- To understand the embryology of Angiosperms.

Unit 1 **(15 hrs)**

External morphology: Types of leaf- Simple and compound. Inflorescence - Racemose, Cymose, Special types (Head, Cyathium). Terminology with reference to Flower description**.**

Unit II **(15 hrs)**

Taxonomy: Bentham and Hookers system of classification. Study of the following families and their economic importance: Annonaceae, Leguminosae, Cucurbitaceae and Asteraceae.

Unit III **(15 hrs)**

Cytology: Ultra structure of plant cell and brief outline of the following organelles: endoplasmic reticulum, mitochondria, chloroplast and nucleus. Cell division: mitosis and meiosis. Genetics- Mendel's mono and dihybrid cross. Incomplete dominance in monohybrid.

Unit IV (15 hrs)

Anatomy: Simple and permanent tissues: Parenchyma, collenchyma, sclerenchyma. Complex permanent tissues: Xylem and phloem. Primary structure of dicot stem and dicot root.

Unit V **(15 hrs)**

Embryology: Structure of anther, male gametophyte. Types of ovule and female gametophyte (Polygonum type). Fertilization. Structure and development of dicot embryo (Capsella type – *Bursa pastoris*).

Text Books:

1. B.P. Pandey 2011, A Textbook of Botany: Angiosperms - Taxonomy, Anatomy, Embryology and Economic Botany, S. Chand Limited.
2. Annie Roland, 2005. Taxonomy of angiosperms, Saras Publication, Nagercoil.
3. Pandey, B. P. 2001. Plant anatomy, S. Chand & Co., New Delhi.

References:

1. Bhojwani, S.S. and Bhatnagar, S.P. 2009. The Embryology of Angiosperms, Vikas Publishing House Pvt. Ltd., New Delhi.
2. Davis, P.H. and Heywood, V.M. 1965. Principles of Angiosperm Taxonomy. Oliver and Boyd Edinburgh.
3. Sambamurthy, A. V. S. S. 1999. Genetics. Narosa Publishing House, New Delhi.

Allied Botany - I **Addition**

For Students Admitted from the academic year 2017 – 2018

Semester II – First Allied Paper - II (Paper Code – 17U2BOA02)

Morphology, Taxonomy of Angiosperms, Cytology, Genetics, Anatomy of Angiosperms and Embryology of Angiosperms.

Credits: 3

Total hrs: 60

Aim:

- To enable students to understand the morphology, taxonomy, anatomy and embryology of angiosperms, structure and function of cellular organelles and Mendel's laws.

Objectives:

- To study external morphology, taxonomy, anatomy and embryology of angiosperms.
- To study the cell organelles and their functions.
- To study Mendel's law.

Unit I **(15 hrs)**

External morphology:

Phyllotaxy. Types of leaf - simple and compound. Inflorescence - Racemose, Cymose and Special types (Head and Cyathium). Terminology with reference to flower description**.**

Unit II **(15 hrs)**

Taxonomy:

Bentham and Hookers system of classification. Study the following families and their economic importance: Annonaceae, Rubiaceae, Cucurbitaceae, Asteraceae and Poaceae. **6%**

Unit III **(15 hrs)**

Cytology and Genetics:

Structure of plant cell and brief outline of the following cell organelles: Endoplasmic Reticulum, Mitochondria, Chloroplast and Nucleus. Cell division: mitosis and meiosis. Genetics- Mendel's mono and dihybrid cross. Back cross and Test cross. **3%**

Unit IV **(15 hrs)**

Anatomy:

Simple and permanent tissues: Parenchyma, Collenchyma and Sclerenchyma. Complex permanent tissues: Xylem and Phloem. Primary structure of dicot root and stem and monocot root and stem. 5%

Unit V **(15 hrs)**

Embryology:

Structure of anther and male gametophyte. Types of ovule and female gametophyte (Polygonum type). Fertilization. Structure and development of dicot embryo (Capsella type – *Bursa pastoris*).

Learning outcome:

- ❖ Acquiring knowledge on morphology, taxonomy, anatomy and embryology of angiosperms, structure and function of cellular organelles and Mendel's laws.

Text Books:

1) Textbook of Botany: Angiosperms - Taxonomy, Anatomy, Embryology and Economic Botany. 2011. B.P. Pandey. S. Chand Publishing, New Delhi.
2) Plant anatomy. 2001. Pandey, B. P. S. Chand & Company, New Delhi.
3) Cytology and Genetics. 2006. Sumitra Sen, Dipak Kumar Kar. Narosa Publishing House Private Limited, New Delhi.
4) Cytogenetics. 2000. Sundararajan, S. Anmol Publications Private Limited, New Delhi.
5) Cytology. 2008. Verma, P. S. and Agarwal, V. K. Chand and Company Limited, New Delhi.

References:

1) The Embryology of Angiosperms. 2009. Bhojwani, S. S. and Bhatnagar, S. P. Vikas Publishing House Private Limited, New Delhi.
2) Davis, P.H. and Heywood, V.M. 1965. Principles of Angiosperm Taxonomy. Oliver and Boyd Edinburgh.
3) Genetics. 1999. Sambamurthy, A. V. S. S. Narosa Publishing House, New Delhi.