Department of Botany
EMPLOYABILITY NEEDS
SEMESTER-I& III – PAPER-1

UBBTA20/UABTA20– OPTIONAL ALLIED BOTANY-I/ALLIED BOTANY-I

Year/ Sem	Course Code	Title of the Course	Course Type	Course Category	H/ W	Credits	Marks
I Year I Sem	UBBTA20	Optional Allied Botany-I	Theory	Allied	4	4	40+60=100
II Year III Sem	UABTA20	Allied Botany-I	Theory	Allied	4	4	40+60=100

Course Outcomes (CO):

On completion of the course, the students will be able to,

1. Outline the general characters, life cycle and economic importance of Algae and Fungi.
2. Distinguish the general characters of Bacteria and Virus
3. Understand the general characters and life cycle of Bryophyta, Pteridophyta and Gymnosperms.
4. Upgrade the knowledge in Cell biology and Genetics
5. Identify the pathogens and the applications of Plants in agriculture.

Unit I: **Algae and Fungi:** **(12 hours)**

1.1 General characters of Algae. (K2)
1.2 Structure, reproduction and life cycle of *Nostoc* and *Sargassum.* (K1, K3)
1.3 Economic importance of Algae. (K4)
1.4 General characters of Fungi. (K2)
1.5 Structure, reproduction and life cycle of *Yeast and Agaricus.* (K1, K2)
1.6 Economic importance of Fungi. (K3)

Unit II: Bacteria and Virus: **(12 hours)**

2.1 General characters of Bacteria (K2)
2.2 Structure and reproduction of *E.coli.* (K3)
2.3 Economic importance of Bacteria. (K4)
2.4 General characters of Viruses. (K2)
2.5 Structure of TMV and Bacteriophage. (K2,K3)
2.6 Structure of COVID-19. (K3)

Unit III: Bryophyta, Pteridophyta and Gymnosperms: **(12 hours)**

3.1General characters of Bryophyta. (K1, K2)
3.2 Structure and life cycle of *Funaria.* (K2, K3)
3.3 General characters of Pteriophyta. (K1, K2)
3.4 Structure and life cycle of *Lycopodium*. (K2, K3)
3.5 General characters of Gymnosperms. (K1, K2)
3.6 Structure and life cycle of *Cycas.* (K3, K4)

Unit IV:Cell Biology and Genetics: (12 hours)

4.1 Ultra structure of Prokaryotic and Plant Eukaryotic cell. (K2, K3)

4.2 Cell organelles- Ultra structure and functions of Chloroplast, Mitochondria and Nucleus. (K2,K3)

4.3 Cell division- Mitosis and Meiosis (K3)

4.4 Genetics-Mendelism-Monohybrid and Dihybrid cross. (K1,K4)

4.5Back cross, Law of dominance, Law of segregation. (K1,K3)

4.6 Incomplete dominance, Law of independent assortment. (K1,K2)

Unit V:Ecology, Crop Management and Applied Botany: (12 hours)

5.1 Ecosystem - structure and functions, Food chain and Food web. (K2, K3)

5.2 Ecological Pyramid, Adaptation of Plants- Hydrophytes, Xerophytes. (K1,K2)

5.3 Symptoms, causative organism and control measures of Tobacco Mosaic disease. (K3)

5.4 Symptoms, causative organism and control measures of Citrus canker. (K2, K3)

5.5 Symptoms, causative organism and control measures of Tikka disease of groundnut. (K3)

5.6 Biopesticides – BT, Biofertilizers in Agriculture (Azolla and BGA), Mycorrhiza. (K3)

Text Books:

1. Kumaresan .V - Algae and Bryophytes, SarasPubliations, Nagercoil, Kaniyakumari. 1997
2. Pandey B.P. - College Botany - Volume I, S.Chand and company pvt.Ltd.,Ramnagar, Newdelhi. 2015
3. Arumugam.N, Kumaresan . V. - Plant Ecology and Phytogeography, Saras Publication, 2005.

Reference Books:

1. VashishtaB.R, Sinha A.K, Singh V.P. - Fungi, S.Chand and company pvt.Ltd.,Ramnagar, Newdelhi.2005
2. Vashishta, B.R, Sinha, A. K and Adarsh Kuma - Botany for degree students -Bryophyta, S. Chand & Company LTD, Ram Nagar, New Delhi. 2005
3. Vashishta, P.C, Sinha,A.K and Anil Kumar, - Botany for degree students- Pteridophyta, S. Chand & Company LTD. Ram Nagar, New Delhi.(Revised edition, 2010).
4. Vashishta, P.C, Sinha,A.K and Anil Kumar - Botany for degree students Gymnosperms, S. Chand & Company LTD. Ram Nagar, New Delhi.(Revised edition, 2014),

Open Educational Resources (OER):

1. https://youtu.be/c2adzEjYUmA
2. https://youtu.be/VIS_4G3Ysyk
3. https://youtu.be/VVuYGkk_I8s
4. https://youtu.be/FmBZGx8fkp0
5. https://youtu.be/URUJD5NEXC8
6. https://youtu.be/2lqhJNgn_Wg

SEMESTER-II& IV – PAPER-2

UBBTB20 /UABTB20- OPTIONAL ALLIED BOTANY-II /ALLIED BOTANY-II

Year/ Sem	Course Code	Title of the Course	Course Type	Course Category	H/ W	Credits	Marks
I Year II Sem	UBBTB20	Optional Allied Botany-II	Theory	Allied	4	4	40+60=100
II Year IV Sem	UABTB20	Allied Botany-II	Theory	Allied	4	4	40+60=100

Course Outcomes (CO):

On completion of the course, the students will be able to

1. Classify Angiosperms and identify the family with the characters .
2. Identify and analyse the histology of Plants.
3. Gain knowledge on Embryology of Plants.
4. Understand the key process of Plant Physiology.
5. Integrate the knowledge of Horticulture in growing Plants.

Unit I: Taxonomy: (12 hours)

1.1 Bentham and Hooker's system of classification, Nomenclature. (K2, K3)
1.2 Study of characters and economic importance of the family Caesalpiniaceae. (K1, K2)
1.3 Study of characters and economic importance of the family Rubiaceae. (K2, K3)
1.4 Study of characters and economic importance of the family Asclepiadaceae. (K2, K4)
1.5Study of characters and economic importance of the family Amaranthaceae. (K2, K4)
1.6 Study of characters and economic importance of the family Liliaceae. (K1,K3)

Unit II:Plant Anatomy: (12 hours)

2.1 Tissues- Meristematic and Permanent tissue. (K1, K2)
2.2 Primary structure of Dicot stem. (K1, K3)
2.3 Primary structure of Monocot stem. (K2, K3)
2.4 Primary structure of Dicot root and Monocot root. (K1,K3)
2.5 Primary structure of Dicot leaf. (K1,K3)
2.6Primary structure of Monocot leaf. (K3)

Unit III:Embryology: (12 hours)

3.1 Structure of mature Anther. (K2,K3)
3.2 Structure of Ovule. (K2,K4)
3.3 Types of Ovules. (K3)
3.4 Structure of Embryo sac. (K3)
3.5Structure of Pollen grain. (K3)
3.6Structure of Dicot embryo, Parthenocarpy. (K1,K3)

Unit IV: Plant Physiology: (12 hours)

4.1 Absorption of Water. (K1,K2)
4.2 Transpiration. (K3,K4)

4.3 Photosynthesis - Light reaction, Calvin cycle. (K1,K3)
4.4 Respiration - Glycolysis, Fermentation, Kreb's Cycle. (K2,K3)
4.5 Electron transport system. (K1,K3)
4.6 Growth hormones - Auxins, Gibberellins and application. (K1, K3)

Unit V: Plant propagation methods: **(12 hours)**

5.1 Tissue Culture-*Invitro* Culture method. (K1,K2)
5.2 Plant tissue culture and its applications. (K1,K3)
5.3 Vegetative Propagation. (K2, K3)
5.4 Horticulture methods – Cutting – Stem Layering-ground layering and air layering. (K2,K3)
5.5 Grafting- Cleft, Bark grafting. (K2,K3)
5.6 Terrace garden, Kitchen garden. (K3)

Text Books:

1. Pandey, B.P -Taxonomy of Angiosperms for University students,(Revised) S. Chand & Company LTD. Ram Nagar, New Delhi, 2009**.**
2. Pandey B.P. - College Botany - Volume II, S.Chand and company pvt.Ltd.,Ramnagar, Newdelhi. 2015

Reference Books:

1.Pandey, B.P. - Embryology of Angiosperms. S. Chand & Company Ltd., New Delhi, 1995.
2. Pandey, S.N. and Sinha, B.K. - Plant Physiology. IV Edition, Vikas Publishing company, Noida, UP, 2009
3.Verma, P.S. and Agarwal, V.K. - Cell biology, Genetics, Molecular Biology, Evolution and Ecology. S.Chand& Company Ltd. New Delhi, 2004
4. Dubey R.C - A textbook of Biotechnology, S.Chand and company pvt. Ltd., Ramnagar, New Delhi, 2015
5.Manibushan Rao. K - Text book of Horticulture. McMillan publication. Co., New York.1991

Open Educational Resources (OER):

1.https://youtu.be/TTIGRcd_ju0
2. https://youtu.be/f2dvh0YNDwM
3. https://youtu.be/C8VHyezOJD4
4. https://youtu.be/dV9QcGs58l0
5. https://youtu.be/NqqeeAlp9zA