

# REDUCED SYLLABUS OF BOTANY (U.G.—Sem V)

**Binod Bihari Mahto Koyalanchal Universty, Dhanbad**  
*B.Sc. Botany (Hons. ) syllabus under CBCS pattern*

**2020**

**B.Sc. BOTANY**

**SEMESTER – V**

**BOT-H-C-511-T (REPRODUCTIVE BIOLOGY OF ANGIOSPERMS)**

**CREDITS-04(THEORY)**

**FULL MARKS: 60**

**LECTURES: 60**

**TIME: 03 HRS.**

*Instructions to Question setter- There will be two groups of questions. Five questions to be answered out of nine questions. Group A is compulsory and will contain two questions. Question no. 1 (A) will be MCQ of 1 mark each (six questions). Question No.1 (B) will be short answer type to be answered in about 50 words of 3 marks (2 questions). Group B will contain descriptive type eight questions of twelve marks each, out of which any four questions are to answer. Each question carries 12 marks.*

## **REPRODUCTIVE BIOLOGY OF ANGIOSPERMS**

### **UNIT-01-ANTHER**

Anther wall: structure and function, microsporogenesis.

### **UNIT-02-POLLEN BIOLOGY**

Microgametogenesis & Palynology and scope (a brief account).

### **UNIT-04-POLLINATION AND FERTILIZATION**

Pollination types and significance, path of pollen tube in pistil; double fertilization and triple fusion.

### **UNIT-5-ENDOSPERM**

Types, development, structure, morphological nature and functions.

### **UNIT-6-EMBRYO**

Development of dicot embryo and monocot embryo.

**UNIT-8- POLYEMBROYONY**

Introduction, classification; causes & application.

**SUGGESTED READINGS**

1. Bhojwani, S.S and Bhatnagar, S.P.(2011). The Embryology of Angiosperms, Vikas Publishing House. Delhi 5<sup>th</sup> edition.
2. Shivanna, K.R. (2013). Pollen Biology and Biotechnology, Oxford and IBH Publishing Co. Pvt. Ltd. Delhi.
3. Raghavan, V.(2000). Development Biology of Flowering plants, Springer, Netherlands.
4. Johri, B.M. I(1984), Embryology of Angiosperms, Springer- Verlag, Netherlands.

**B.Sc. BOTANY**

**SEMESTER – V**

**BOT-H-C-S12-T (PLANT BIOTECHNOLOGY)**

**CREDITS-04(THEORY)**

**FULL MARKS: 60**

**LECTURES: 60**

**TIME: 03 HRS.**

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**PLANT BIOTECHNOLOGY**

**UNIT 1**

Introduction, history, Infrastructure & Organization of plant tissue culture laboratory – General & aseptic laboratory, different work areas, equipments & instruments required, other requirements.

Culture Medium – Nutritional requirements of the explants, PGR's & their in vitro roles, Media preparation.

**UNIT 3**

**Anther & pollen culture technique** – introduction, principle, protocol, factors affecting;  
**Protoplast** – protoplast isolation, protoplast culture.

**UNIT 4**

**Somatic hybridization** – Protoplast fusion techniques, selection of hybrids, production of symmetric & asymmetric hybrids cybrid production.

**UNIT-06-Recombinant DNA Technology**

Introduction, definition, steps of Gene cloning, Basic tools used for Gene cloning. Restriction endonucleases, types, nomenclature, Recognition sequences, Cloning vectors in prokaryotes; - pBR 322, Cosmids, Phagemid, Cloning vectors in eukaryotes;- Yeast vectors, *Agrobacterium* – Ti plasmid , Ri-plasmid, Hybridization techniques (Northern, southern, western blotting), PCR

**UNIT-07- Application Of Biotechnology**

Pest resistant (Bt-cotton), Transgenic crops with improved quality traits (*Flavr savrtomato*, Golden rice), Impact of transgenic crops on society.

**SUGGESTED READING**

1. Bhojwani, S.S. and Razdan 2004 Plant Tissue Culture and Practice.
2. Brown, T. A. Gene cloning and DNA analysis: An Introduction. Blackwell Publication.
3. Gardner, E.J. Simmonns, M.J. Snustad, D.P. 2008 8th edition Principles of Genetics. Wiley India.
4. Raven, P.H., Johnson, GB., Losos, J.B. and Singer, S.R. 2005 Biology. Tata MC Graw Hill.
5. Reinert, J. and Bajaj, Y.P.S. 1997 Applied and Fundamental Aspects of Plant Cell, Tissue and Organ Culture. Narosa Publishing House.
6. Russell, P.J. 2009 Genetics – A Molecular Approach. 3rd edition. Benjamin Co.
7. Sambrook & Russel. Molecular Cloning: A laboratory manual. (3rd edition)
8. Slater, A., Scott, N.W. & Fowler, M.R. 2008 Plant Biotechnology: The Genetic Manipulation of Plants, Oxford University Press.

**BOT-H-C-511-P & 512-P PRATICAL**

**F.M.- 40**

1. Embryo Dissection
2. Study of structure of anthers, types of ovules, structure of a mature embryo sac by photographs.
3. Preparation of culture media
4. Process of surface sterilization and inoculation of explants
5. Study of anther, embryo, endosperm, micropapagation and somatic hybridization through photographs.

**PRATICAL EXAMINATION**

**F.M.- 40**

**Time- 3 hrs**

01. Embryo Dissection of (dicot embryo)	10
02. Process of surface sterilization and inoculation of explants	08
03. Spotting	(2x5) = 10
04. Class records, charts, models.	06
05. Viva-voice	06

**B.Sc. BOTANY**

**SEMESTER – V**

**BOT-H-DSE-501A-T (PLANT BREEDING)**

**CREDITS-04(THEORY)**

**FULL MARKS: 60**

**LECTURES: 60**

**TIME: 03 HRS.**

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**PLANT BREEDING**

**UNIT 1:** Introduction and objectives.

**Unit 2:-** Methods of Crop Improvement, Introduction, Selection, Hybridization.

**UNIT 3:-** Inbreeding, Inbreeding Depression, Heterosis.

**Unit 4:-** Role of Mutation, Polyploidy, Distant Hybridization, Role of Biotechnology in crop improvement.

**SUGGESTED READING**

1. Singh, B.D (2005), Plant breeding; principles and Methods, Kalyani Publishers, 7<sup>th</sup> edition.

**B.Sc. BOTANY**

**SEMESTER – V**

**BOT-H-C-502A-T (NATURAL RESOURCE MANAGEMENT)**

**CREDITS-04(THEORY)**

**FULL MARKS: 60**

**LECTURES: 60**

**TIME: 03 HRS.**

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**NATURAL RESOURCE MANAGEMENT**

**UNIT 1: Natural resources, Definition, types, Sustainable utilization- Concept, approaches, (Economical, Socio- cultural, Ecological).**

**UNIT 2: Land- Soil degradation and management- Water- Fresh water estuaries, wet lands, threats, and management strategies.**

**UNIT 3: Biological Resource - Biodiversity- Definition and types, Significance, threat and management.**

**Forest- Definition, Importance and management.**

**UNIT 4: Energy- Renewable and Non renewable sources.**

**PRACTICALS (BOT-H-DSE-501A & 502 A)**

**40 MARKS**

1. Hybridization techniques:  
Emasculation and bagging.
2. Study of Cyanobacteria- Study with the help of Photographs.
3. Study of Biodiversity of the college campus.

**EXAMINATION**

**FULL MARKS- 40**

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|---|--------|
| 1. Hybridization techniques:<br>Emasculation and bagging.   | 10     |
| 2. Study of Cyanobacteria- Study with the help of Photographs<br><b>or</b><br>Study of Biodiversity of the college campus | 08     |
| 3. Spotting   | 5x2=10 |
| 4. Records/ projects  | 06     |
| 5. Viva- Voice  | 06     |



SUBJECT — BOTANY  
SEM. 5 (V)  
REDUCED SYLLABUS.

Paper 511 — submitted  
512 — "  
DSE — 501 Plant Breeding  
No change  
BDSE — 502A — Natural  
Resource Management  
— Unit 5 Deleted  
General — No change

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