TRIPURA UNIVERSITY

(A Central University)
Suryamaninagar

SYLLABUS

OF

Botany

(General & Major)

Semester-I

Year 2014

Botany (General)

Semester Examination system

Duration: 3 Years (Six Semesters)

Semester	Theoretical Marks	Practical Marks	Total Marks
Semester-I	100 (IA*-20 + ES*-80)	-	100
Semester-II	50 (IA-10+ ES-40)	50 (IA-10+ ES-40)	100
Semester-III	50 (IA-10+ ES-40)	50 (IA-10+ ES-40)	100
Semester-IV	50 (IA-10+ ES-40)	50 (IA-10+ ES-40)	100
Semester-V	50 (IA-10+ ES-40)	50 (IA-10+ ES-40)	100
Total	300	200	500

*IA= Internal Assessment; *ES = End semester Examination

Credit distribution

B. Sc. (General) in Botany

Semester	Paper No.	Credit distribution			Total Credits/Semester
		L	T	P	
I	BT- 101(T)	3	1	0	4
II	BT- 201(T)	2	0	0	2
	BT - 202(P)	0	0	2	2
III	BT- 301(T)	2	0	0	2
	BT - 302(P)	0	0	2	2
IV	BT- 401(T)	2	0	0	2
	BT - 402(P)	0	0	2	2
V	BT- 401(T)	2	0	0	2
	BT - 402(P)	0	0	2	2
Total Credits		11	1	8	20

L = Lecture, T= Tutorial, P= Practical

Botany (General)

Course Structure

Course Title	Full Marks	Total Credits
Semester I		
BT 101(Theory) **(Fundamental, Environmental and Industrial Botany)**	**100**	**4**
Semester II		
BT 201(Theory) **(Algae, Bryophytes, Pteridophytes, Gymnosperms & Paleobotany)**	**50**	**2**
BT 202 (Practical)-Based on Theory Course – BT201	**50**	**2**
Semester III		
BT 301(Theory) **(Microbiology, Fungi, Plant pathology & Plant Resource Utilization)**	**50**	**2**
BT 302 (Practical)-Based on Theory Course – BT301	**50**	**2**
Semester IV		
BT 401(Theory) **(Morphology, Taxonomy, Anatomy & Ecology & Phytogeography)**	**50**	**2**
BT 402 (Practical) Based on Theory Course – BT401	**50**	**2**
Semester V		
BT 501(Theory) **(Cell & Molecular Biology, Cytogenetics & Plant breeding, Plant Physiology & Plant Bio-technology)**	**50**	**2**
BT – 502 (Practical) Based on Theory Course – BT501	**50**	**2**

TRIPURA UNIVERSITY

Botany (General)

Semester I

(Theoretical)

Paper- BT 101

Full marks-100
Total Lectures - 48 periods
(Each period = 1 hour)

Unit-I: (Fundamental Botany) **(12 Periods)**

1.1 Origin of life, Difference between plant and animal cell.
1.2 Three domains of classification- Archaea, Bacteria, Eukaryota.
1.3 History of Plant Classification: Natural (Bentham & Hooker), Artificial (Linnaeus) and Phylogenetic (Hutchinson) system of Classification.
1.4 Plant life cycle pattern & alternation of generation.
1.5 Darwin's theory of evolution, Species concept, Isolation & mechanism of speciation.

Unit -II: (Environmental Botany) **(12 Periods)**

2.1 Pollution: Definition and categories
2.2 Air pollution: Types and sources of air pollutants and their effects on plants and animals.
2.3 Water pollution: Types and sources of pollutants and their effects on plants and animals.
2.4 Soil pollution: Sources of pollutants and their effects on living organisms.
2.5. Noise pollution, heavy metal pollution and radioactive pollution.

Unit -III: Industrial Botany -I (Agri Industries and Microbial fermentation and food)
(12 Periods)

3.1 Organic farming- Concept, need, types of organic fertilizers, advantages and limitations.
3.2 Importance of seed industries, Seed production, Seed processing and marketing, major seed industries & corporation of India.
3.3. Production of SCP from algae - *Spirulina* culture technique
3.4 Mushroom production and harvesting (*Volvoriella* sp)
3.5. Commercial Production of Ethyl alcohol and Citric acid.

Unit -IV: Industrial Botany – II (Plant Nursery and Floriculture Industry) (12 Periods)

4.1 Concept and types of nurseries: ornamental plant nursery, fruit plant nursery and vegetable plant nursery (with reference to infrastructure required and commercial applications).
4.2 Propagation methods: Seed propagation, natural vegetative propagation and artificial vegetative propagation ((cutting, layering and grafting),
4.3 Introduction to floriculture: Important floricultural crops, open cultivation practices, harvesting and marketing.

B.Sc. Botany (Major)

Semester Examination system

Duration: 3 Years (Six Semesters)

Semester	Theoretical Marks	Practical Marks	Total Marks
Semester-I	100 (IA-20 + ES-80)	-	100
Semester-II	60 (IA-12+ ES-48)	40(IA-8 + ES-32)	100
Semester-III	60 (IA-12+ ES-48)	40(IA-8 + ES-32)	100
Semester-IV	60 (IA-12+ ES-48)	40(IA-8 + ES-32)	100
Semester-V	60 (IA-12+ ES-48)	40(IA-8 + ES-32)	200
Semester-VI	60 (IA-12+ ES-48)	40(IA-8 + ES-32)	200
Total	480	320	800

Credit distribution

B. Sc. (Major) in Botany

Semester	Paper No.	Credit distribution			Total Credits/Semester
		L	T	P	
I	BT- 101(T)	3	1	0	4
II	BT- 201(T)	2	0	0	2
	BT - 202(P)	0	0	2	2
III	BT- 301(T)	2	0	0	2
	BT - 302(P)	0	0	2	2
IV	BT- 401(T)	2	0	0	2
	BT - 402(P)	0	0	2	2
V	BT- 501(T)	4	0	0	4
	BT - 502(P)	0	0	4	4
VI	BT- 501(T)	4	0	0	4
	BT - 502(P)	0	0	4	4
Total Credits		17	1	14	32

L = Lecture, T= Tutorial, P= Practical

Botany (Major)

Course Structure

Course Title	Full Marks	Total Credits
Semester I		
BT 101(Theory) (Fundamental, Environmental and Industrial Botany)	100	4
Semester II		
BT 201(Theory) (Algae, Bryophytes, Pteridophytes, Gymnosperms & Paleobotany)	50	2
BT 202 (Practical)-Based on Theory Course – BT201	50	2
Semester III		
BT 301(Theory) (Microbiology, Fungi, Plant pathology & Plant Resource Utilization)	50	2
BT 302 (Practical)-Based on Theory Course – BT301	50	2
Semester IV		
BT 401(Theory) (Morphology & Embryology, Taxonomy, Anatomy , Ecology & Phytogeography)	50	2
BT 402 (Practical) Based on Theory Course – BT401	50	2
Semester V		
BT 501(Theory) (Cell & Molecular Biology, Cytogenetics, Plant breeding and Biostatistics)	100	4
BT – 502 (Practical) Based on Theory Course – BT501	100	4
Semester VI		
BT 601(Theory) (Biochemistry, Plant Physiology, Pharmacognosy and Plant Biotechnology)	100	4
BT – 602 (Practical) Based on Theory Course – BT601	100	4

Semester-I

Syllabus for B.Sc. Botany (Major)

2014

(Theoretical)

Paper- BT 101

Full marks-100
Total Lectures – 56 periods
(Each period = 1 hour)

Unit-I: (Fundamental Botany) **(14 Periods)**

1.1. Origin of life, Difference between plant and animal cell. Time line of plant evolution.

1.2. Three domains of classification- Archaea, Bacteria, Eukaryota.

1.3. History of Plant classification: Natural (Bentham & Hooker), Artificial (Linnaeus) and Phylogenetic (Hutchinson) system of Classification.

1.4. Plant life cycle pattern & alternation of generation.

1.5 Darwin's theory of evolution. Macro & micro evolution.

1.6. Species concept, Isolation & mechanism of speciation.

Unit-II: (Environmental Botany) **(14 Periods)**

2.1.Pollution: Definition and categories

2.2. Air pollution: Types and sources of air pollutants and their effects on plants and animals.

2.3. Water pollution: Types and sources of pollutants and their effects on plants and animals.

2.4. Soil pollution: Sources of pollutants and their effects on living organisms.

2.5. Bioremediation, noise pollution, acid rain, classical and photochemical smog, heavy metal pollution and radioactive pollution.

2.6. Greenhouse effect and global warming- basic concept; significance of ozone umbrella, ozone hole- types of ozone depleting chemicals and their interactions.

Unit-III: Industrial Botany -I (Agri Industries and Microbial fermentation, food & Bio-fuels) **(14 Periods)**

3.1. Organic farming- Concept, need, types of organic fertilizers, advantages and limitations.

3.2. Importance of seed industries, Seed production, Seed processing and marketing, major seed industries & corporation of India.

3.3. Production of SCP from algae - *Spirulina* culture technique

3.4. Mushroom production and harvesting (*Volvoriella* sp. and *Pleurotus* sp.)

3.5. Commercial Production of Ethyl alcohol, Citric acid and Penicillin

3.6. Concept of biofuel and its need, Plants used for biofuel production.

Unit-IV: Industrial Botany – II (Plant Nursery and Floriculture Industry) (14 Periods)

4.1. Concept and types of nurseries: ornamental plant nursery, fruit plant nursery, medicinal plant nursery, vegetable plant nursery and orchid nursery (with reference to infrastructure required and commercial applications).

4.2. Propagation methods: Seed propagation, natural vegetative propagation and artificial vegetative propagation (Cutting: Stem, Layering: Air layering, Grafting: Stone grafting and Approach grafting, Budding: T budding).

4.3. Introduction to floriculture: Important floricultural crops, open cultivation practices, harvesting and marketing.

Suggested Books:

1. **Brodie J. and Lewis J. (2007).** (Ed.) Unravelling the algae: the past, present and future of algal systematics. CRC press. New York.

2. **Graham L.E. and Wilcox L.W. (2000).** Algae. Penticce-Hall,Inc.

3. **Lee R.E. (2008).** Phycology. Cambridge University Press.

4. **Das Dutta and Gangulee.** College Botany Vol I. Central Book Depot.

5. **Vashista B.R, Sinha A.K and Singh V.P. (2005).** Botany for degree students –Algae, S.Chand's Publication.

6. **Chopra R.N. and Kumar P.K. (1988).** Biology of Bryophytes. John Wiley &Sons, New York, NY.

7. **Parihar N.S. (1980).** Bryophytes: An Introduction to Embryophyta. Vol I.Central Book Depot, Allahabad.

8. **Udar R. (1970).** Introduction to Bryophytes. Shashidhar Malaviya Prakashan.Lucknow.

9. **Vashista B.R., Sinha A.K., Kumar A. (2008).** Botany for degree students –Bryophyta, S.Chands Publication.

10. **Agashe S.N. (1995).** Paleobotany. Oxford and IBH Publishing Co. Pvt. Ltd. NewDelhi.

11. **Arnold A.C. (2005).** An Introduction to Paleobotany. Agrobios (India). Jodhpur.

12. **Rashid A. (1999).** An Introduction to Pteridophyta. Vikas Publishing House Pvt.Ltd. New Delhi.

13. **Sporne K.R. (1986).** The morphology of Pteridophytes. Hutchinson UniversityLibrary, London.

14. **Stewart W.N. and Rothwell G.W. (2005).** Paleobotany and the Evolution of Plants. 2nd Edn. Cambridge University Press.

15. **Vashista B.R., Sinha A.K., Kumar A. (2008).** Botany for degree students –Pteridophyta, S.Chands Publication.

16. **Gangulee and Kar (2006).** College Botany. New Central Book Agency.

17. **Parihar N.S. (1976).** Biology and Morphology of Pteridophytes. Central Book Depot.

18. **Bhatnager, S.P. and Moitra, A. 1996.** Gymnosperms. New Age International (P) Ltd. Publishers, New Delhi.

19. **Chamberlain, CJ.1957.** Gymnosperms- Structure and Evolution. Amazon.com

20. **Verma and Chopra 1981.** Text book of Gymnosperms; Pradeep Publications.

21. **Jhori, RM, Sneh Lata and Kavita Tyagi, 2012.** A Text book of Gymnosperm. Vedams books. India.

22. **Gurcharan Singh Randhawa and Amitabha Mukhopadhyay.** Floriculture in India,

Allied Publishers.

23. Debashish Sengupta and Raj Kamal. Floriculture Marketing in India. , Excel Books.

24. Floriculture Hand Book, Eiri. Engineers India Research in Publication.

25. John Mason. Nursery Management. John Mason. LandLinks Press Publisher.

26. Plant Nursery Management: How to Start and Operate a Plant Nursery. Ray.

27. The Complete Book on Organic Farming and Production of Organic Compost, NPCS Board of Consultants & Engineers. Asia Pacific Business Press Inc.

28. The Organic Farming Manual: A Comprehensive Guide to Starting and Running a Certified Organic Farm, Ann Larkin Hansen. Storey Publications.

29.Hand Book of Mushroom Cultivation, Processing and Packaging, Engineers India Research in Publishers

30. Handbook of Seed Science and Technology: Seed biology, Production, and Technology. Amarjit S. Basra, Food Products Press publishers

31. N. Kumar 2006. Breeding of Horticultural crops. New India Publishing house.

32. D. K. Asthana and M. Asthana. A Textbook of Environmental Studies. S. Chand and Company Ltd.

33. T. K. Saha. Ecology and Environmental Biology. Books and Allied (P) Ltd.

34, M. C. Dash and S. P. Dash. Fundamental of Ecology. The Tata Mc Graw –Hill Company.

35. K. P. Aneja. Experiments in Microbiology, Plant Pathology and Biotechnology. New Age International Publishers.

36. A. K. Joshi and B. D. Singh. Seed Science and Technology. Kalyani Publishers.

37. N. C. Singhal. Seed Science and Technology. Kalyani Publishers.