

Course Structure in Ph.D. Coursework of Botany



Coursework						
Type of Courses	Marks	Credits in Coursework				
	Theory + Internal Assessment	Total	Lecture (L)	Tutorial & Assignment (T)	Practical (P)	Total Credits
Core Course-4 (PHD-Bot-5044) Floristic diversity & Bioentrepreneurships of Assam	80+20	100	3	1	0	4
Optional Course-5 (PHD-Bot-5054) Plant Physiology & Biochemistry	80+20	100	3	1	0	4
Term Paper/Project Work Course-6 (PHD-Bot-5062) Statistical Analysis and Data Representation	40+10	50	2	1	0	2

Programme Specific Objectives:

- To train up skilled human resources in different areas of plant sciences.
- To promote, cultivate and development of medicinal plants species for sustainable utilization.
- To understand the importance of floristic diversity and wild bio-resources in terms of food security, health and environmental hazards.
- To promote entrepreneurship on indigenous medicinal plants as alternative source of employment and income to the local masses.

Ph.D. Course Work Syllabus
Subject: Botany (Core Paper)
Floristic Diversity & Bio-entrepreneurship of Assam
Code: PHD-Bot-5044

Credit-4

Unit I:

Biological diversity; magnitude and distribution of biodiversity; evolution of biodiversity; concept of diversity hotspots; biodiversity in India; global distribution of biodiversity (latitudinal diversity gradient); biome.

Unit II:

Sustainable use of biodiversity; wild bio resources in terms of food security, health and environmental hazards. Ecosystems harbouring wild bio resources, use and trade of wild bio-resources, biodiversity and legal issues; analysing and discussion of causes and consequences of changes in biodiversity in North East Scenario.

Unit III:

Floral species useful for different purposes- food including local beverages, spices and condiments. Conservation strategies; *in-situ* conservation: assessment of adequate areas, design and management of protected areas; conservation genetics; wildlife biology; *ex-situ* conservation: facilities, establishment of new populations, captive breeding, reintroduction.

Unit IV:

Entrepreneurship on indigenous medicinal plants, Non-conventional food plants, bamboo, spices, horticulture, coloured rice varieties indigenous fruits, mushroom, bioenergy, biofertilizers, biopesticides.

Recommended Books:

1. Positive Health and Happiness, 2nd Edition, Behl P.N.; CBS Publishers Pvt. Ltd.
2. Trees of India, Warman C.K.; CBS Publishers Pvt. Ltd.
3. Medicinal Plants in Industry, Sammbamurty / Subrahmanyam; CBS Publishers Pvt. Ltd.
4. Fundamental of Plant Pest Control; Roberts; CBS Publishers Pvt. Ltd.
5. Indian Medicinal Plants (in 8 vols); Kirtikar & Basu; CBS Publishers Pvt. Ltd.
6. Indian Systems of Medicine: Skin Diseases; Hameed & Vohora; CBS Publishers Pvt. Ltd.
7. Taxonomy and Plant Conservation; Manilal & Pandey; CBS Publishers Pvt. Ltd.
8. Responses of Plants to Environment; Levitt, Gacob (1980) 2nd edition (vol 1 & 2); Academic press in company, New York
9. Handbook of Bioentrepreneurship edited by Thomas Brenner and Holger Patzelt

Ph.D. Course Work Syllabus
Subject: Botany (Optional)
Plant Physiology and Biochemistry
Code: PHD-Bot-5054
Credit-4

Unit I:

Plant Water relationship: Diffusion and water potential, Movement of water in plant, Absorption of water; Transpiration: Stomata regulation of transpiration, the Role of transpiration, hormonal and energy dependent hypothesis.

Unit II:

Mineral nutrition and metabolism: Physico-chemical aspects of solute transport, Co-transport and counter transport; Ion channels- role of calmodulin; foliar nutrition, use of chelates and soil conditioner. Nitrogen metabolism- Bio- chemistry of N_2 fixation, Amino acids and protein synthesis.

Unit III:

Enzymes: Mode of enzyme action, factors influencing enzyme activity, allosteric enzymes, isoenzymes, multienzymes; Enzyme-linked receptors in cell signaling; Industrial application of enzymes; Basic techniques in enzyme research.

Unit – IV:

Photosynthesis and respiration: Photosynthetic electron transport, Carbon metabolism, Photorespiration, Energy concept of photosynthetic processes. Oxidative phosphorylation, Gluconeogenesis, Cyanide resistant pathway. Recent trends of research in photosynthesis.

Unit V:

Growth physiology and physiology of flowering: Plant growth hormones- synthesis, bioassay and mechanism of action, Role in agriculture and horticulture. Photoperiodism, vernalisation, florigen concept, role of phytochrome in flowering. Senescence. Seed physiology- Dormancy, Enzymatic regulation of seed germination.

Recommended Books:

1. Plant Physiology, (1986), Salisbury & Ross; CBS Publishers and Distributors Pvt. Ltd.
2. Taiz, L., Zeiger, E., (2010), Plant Physiology, Sinauer Associates Inc. U.S.A. 5th Edition
3. Hopkibs, W.K., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition
4. Bajracharya, D., (1999). Experiments in Plant Physiology - A Laboratory Manual, Narosa Publishing House, New Delhi.
5. I. Kochhar, S.L. (2011). Economic Botany in the Tropics, MacMillan Publishers India Ltd. New Delhi. 4th edition.
6. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
7. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
8. Ghosh Z. and Bibekanand M. (2008) Bioinformatics: Principles and Applications. Oxford University Press.
9. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.

Ph.D. Course Work Syllabus

Subject: Botany

(Term Paper/ Project Work)

Course-6 (PHD-Bot-5062)

Credit-2

Unit I: Statistical analysis and data representation: SD, SE, Co-relation and Regression, Test of significance, ANOVA, DMRT, data validation, biological significance of data.

Unit II: Sampling size in data analysis, utility of computer/ software (MS office, excel, power point, graphics, sigma plot, SPSS etc.) in data analysis and presentation.