

ARYAVART INTERNATIONAL UNIVERSITY

Tilthai, Dharmanagar, North Tripura-799250

Syllabus for M Sc (Botany)

Semester 1

Theory									
Course Code	Topic	L	T	P	Credit	Theory Marks	Internal Marks	Practical Marks	Total Marks
24BO101	Non-vascular Cryptogams	4	0	0	4	70	30	0	100
24BO102	Vascular plants	4	0	0	4	70	30	0	100
24BO103	Plant Ecology, Biodiversity and Conservation Biology	4	0	0	4	70	30	0	100
Skill Enhancement Course (SEC)									
24CS101	Fundamentals of IT	4	0	0	4	70	30	0	100
Practical									
24BO191	Non- Vascular cryptogams and Vascular Plants	0	0	4	4	0	30	70	100
24BO192	Plant Ecology, Biodiversity and Conservation Biology	0	0	4	4	0	30	70	100
Total					24	280	180	140	600

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Detailed Syllabus

NON-VASCULAR CRYPTOGRAMS

Code: 24BO101

Max. Marks: 70

Unit I: Algae

1. Classification of algae- comparative survey of important system: Fritsch-Smith-Round.
2. Ultra structure of algal cells: cell wall, chloroplast, eyespot and their importance in classification.
3. Structure and function of heterocysts, pigments in algae and Economic importance of algae.
4. General account of thallus structure, reproduction, evolutionary trends in the following groups- Cyanophyta, Chlorophyta, Xanthophyta, Bacillariophyta, Phaeophyta and Rhodophyta.

Unit II: Fungi and Lichen

1. Fungi -classification, cell structure, degeneration of sex, Heterothallism, Parasexuality.
2. Nutrition, phylogeny, and Economic importance of fungi.
3. Comparative account of thallus structure, reproduction, and life cycle pattern of- Myxomycotina: Plasmodiophorales, Zygomycotina: Mucorales, Ascomycotina: Endomycetales, Basidiomycotina and Agaricales, Deuteromycotina.
4. Lichen: Classification, reproduction and Economic importance.

Unit III: Bryophytes

1. Classification of Bryophytes.
2. Fossil history of bryophytes
3. Primitive versus advanced characters.
4. Spore Germination
5. Bud Formation
6. Spore germination
7. Parthenogenesis, Apogamy
8. Comparative morphology and developmental anatomy of Hepaticae.
9. Ecology- habitats, water relations (Ectohydric, endohydric and myxohydric bryophytes); Bryophytes as pollution indicators; Economic importance of bryophytes.

Suggested Readings:

1. Bilgrami K. S. and Saha L. C. 2007. A Textbook of Algae. CBS Publishers & Distribution.
2. Bold and Wynne. 1985. Introduction to algae– Structure and reproduction. Prentice– Hall, India,
3. Kumar, H. D. 1990. Introductory phycology, Affiliated East West Pvt. Ltd., Bangalore, India.
4. Round, F. E. 1973. Biology of algae. Edward Arnold Publishers, London
5. Sambamurty, A. V. S. S. 2005. A Textbook of Algae. I. K. International Pvt. Ltd., New Delhi.
6. Ainsnorth G. C 1973. The Fungi Vol. IV A, IVB Academic Press.
7. Alexopoulos C. J, Mims C.W. and Blackwell M. I. 1996. Introductory Mycology. John Wiley and Inc.
8. Burnett J. H. 1968. Fundamentals of Mycology. Edwards Arnold Publication.
9. Hawker L. E. 1967. An Introduction to Fungi Cambridge Press.

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VASCULAR PLANTS

Code: 24BO102

Max. Marks: 70

UNIT I

1. Theories of origin and interrelationship of pteridophytes;
2. Classification of pteridophytes; apospory and apogamy.
3. Heterospory and seed habit, Evolution of Sorus
4. Evolutionary trends & Economic importance of pteridophytes.
5. Morphology, anatomy and reproduction of Psilophyta (*Psilotum*, *Tmesipteris*), Lycophyta (*Phylloglossum*, *Isoetes*), Sphenophyta (*Equisetum*).

UNIT II

1. Fossils Pteridophytes:
2. Morphology, anatomy and reproductive characteristics and affinities of major fossil groups- Psilophytales, Lepidodendrales, Zosterophyllales, Calamitales, Cladoxylales and Coenopteridales.
3. Geological time-scale and correlated predominant gymnosperm flora;
4. Salient structural features and affinities of fossil gymnosperms - Pro-gymnosperms, Pteridospermales, Bennettitales.

UNIT III

1. Diversity and distribution, Morphology, anatomy and reproduction of Cycadales (*Cycas*); Coniferales (*Pinus*), Ginkgoales (*Ginkgo*).
2. Range of vegetative and reproductive structure and their modification in angiosperms; A critical study of the current ideas on the origin of angiosperms.
3. Origin and evolution of inflorescence and flower, special type of inflorescence, evolution of placentation types, inferior ovary- foliar and axillary concepts.

Recommended Readings:

1. Agashe S.N. (1995). Paleobotany. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.
2. Arnold A. C. (2005). An Introduction to Paleobotany. Agrobios (India). Jodhpur.
3. Eames E. J. (1983). Morphology of Vascular Plants. Standard University Press.
4. Rashid A. (1999). An Introduction to Pteridophyta. Vikas Publishing House Pvt. Ltd. New Delhi
5. Bhatnagar, S. P. and Moitra A. 1996. Gymnosperms. New Age International Private Limited, New Delhi;
6. Biswas, C. and Johri, B. M. 1997. The Gymnosperms, Narosa Publishing House, New Delhi;

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PLANT ECOLOGY, BIODIVERSITY AND CONSERVATION BIOLOGY

Code: 24BO103

Max. Marks: 70

UNIT I

1. Scope and concept of plant ecology;
2. Principles of ecology;
3. light, water and fire as ecological factors;
4. Origin and development of soil

UNIT II

1. Population Ecology-Concept. population characteristics:
2. Density, natality, mortality, dispersion, population size, age structure, biotic potential, life tables;
3. Population dynamics: population increase, population growth curves; population regulation;
4. Neural impulse induction through an axon, neurotransmitters and synaptic transmission mode of information transfer across electrical and chemical synapses.
5. Concept of biotic community
6. Characteristics of communities (analytical and synthetic);
7. Concept of ecological niche.
8. Ecological succession: types

UNIT III

1. Biodiversity – types, levels, threats, value and uses
2. Distribution and gradients of biodiversity,
3. Mega-diverse nations
4. Biodiversity hotspots with special emphasis on Indian hotspots,
5. Conservation strategies, IUCN Red list of threatened species; extinction of species.

Recommended Books:

1. Bharucha, F. R. (1983). A textbook of plant geography of India. Oxford University Press, 179 pages
2. Cain, S. A. (1944): Foundations of Plant Geography, Harper & Brothers, N.Y.
3. Chapman, J. L. and Reiss, M. J. (1992). Ecology—Principles and Applications, Cambridge University Press, Cambridge, UK
4. Good, R. (1997): The Geography of flowering Plants (2nd Edn.), Longmans, Green & Co., Inc., London & Allied Science Publishers, New Delhi -495pp.,
5. Krishnamurthy, K.V. A textbook of Biodiversity, Science Publishers Inc., Enfield, New Hampshire, USA.
6. Mishra, K. C. Manual of Plant Ecology -Oxford & IBH
7. Sharma, P. D. (2009). Ecology and Environment, Rastogi Publications, Meerut, India
8. Shukla, R. S. & Chandel P. S. (1991): Plant Ecology & Soil Science, S. Chand & Co., New Delhi.

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.FUNDAMENTALS OF IT

Code: 24CS101

Max Marks: 70

UNIT I

Fundamentals of Computers: Definition and Characteristics of Computer System. Computer Generation from First Generation to Fifth Generation. Classifications of Computers: Micro, Mini, Mainframe and super computers.

Computer Hardware: Major Components of a digital computer, Block Diagram of a computer, Input-output devices, Description of Computer Input Units, Output Units, CPU.

Computer Memory: Memory Hierarchy, Primary Memory– RAM and its types, ROM and its types, Secondary Memory, Cache memory. Secondary Storage Devices - Hard Disk, Compact Disk, DVD, Flash memory.

UNIT II

Interaction with Computers: Computer Software: System software: Assemblers, Compilers, Interpreters, linkers, loaders.

Application Software: Introduction to MS Office (MS-Word, MS Power point, MS-Excel).

Operating Systems: Elementary Operating System concepts, Different types of Operating Systems.

DOS: Booting sequence; Concepts of File and Directory, Types of DOS commands.

Computer Languages: Introduction to Low-Level Languages and High-Level Languages.

UNIT III

Computer Number System: Positional and non-positional number systems, Binary, Decimal, Octal and Hexadecimal Number Systems and their inter-conversion.

Binary Arithmetic: Addition, subtraction, multiplication and division. Use of complement method to represent negative binary numbers, 1's complement, 2's complement, subtraction using 1's complement and 2's complement. Introduction to Binary Coded Decimal (BCD), ASCII Codes, EBCDIC codes.

UNIT IV

Computer Network & Internet: Basic elements of a communication system, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), Basics of Internet and Intranet.

Internet: Terminologies related to Internet: Protocol, Domain name, Internet Connections, IP address, URL, World Wide Web. Introduction to Client-Server Model, Search Engine, Voice over Internet Protocol (VOIP), Repeater, Bridge, Hub, Switch, Router, Gateway, Firewall, Bluetooth technology.

Advanced Trends in IT Applications: Brief Introduction to Cloud Computing, Internet of Things, Data Analytics, AI and Machine Learning.

Text Book:

1. P. K. Sinha & Priti Sinha, "Computer Fundamentals", BPB Publications, 1992.
2. Anita Goel "Computer Fundamentals", Pearson.

Reference Books:

1. B. Ram Computer Fundamentals Architecture and Organization, New Age Intl.
2. Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing.
3. Norton Peter, "Introduction to computers", 4th Ed., TMH, 2001.
4. Vikas Gupta, "Comdex Computer Kit", Wiley Dreamtech, Delhi, 2004.

NON-VASCULARCRYPTOGAMS & VASCULAR PLANTS (PRACTICAL)

Code: 24BO191

Max. Marks: 70

Contents:

1. Algae: Study and identification of available specimen (at least two) in each of the following classes: Cyanophyta, Chlorophyta, Xanthophyta, Rhodophyta.
2. Fungi: Thallus organization, Spore producing organs, Tissue differentiation and accessory structures of following –Myxomycotina, Basidiomycotina and Deuteromycotina
3. Identification with only diagnostic features (specimen or model/diagnostic photograph):
 - a. Bryophytes: Study and identification of available specimen (at least two) in each of the following classes: Hepaticopsida, Anthocerotopsida, and Bryopsida
 - b. Pteridophytes: Study of major groups of fossil pteridophytes, study of available living members of pteridophytes, study of soral characters of ferns available in N. E. region, study of epidermal morphology of some important ferns.
4. Gymnosperm: Comparative study of the vegetative, reproductive parts and anatomy of the following: *Zamia*, *Araucaria*, *Cupressus*, *Ginkgo*, *Taxus*, *Ephedra* and *Gnetum*.
5. Angiosperms Morphology: Study of epidermal morphology: hair, trichomes, venation, stomata, morphology of different types of inflorescences, morphological study of primitive and advanced flowers, morphology of different types of ovary and placentation types.
6. Preparation of practical record and submission.
7. Viva-voce.

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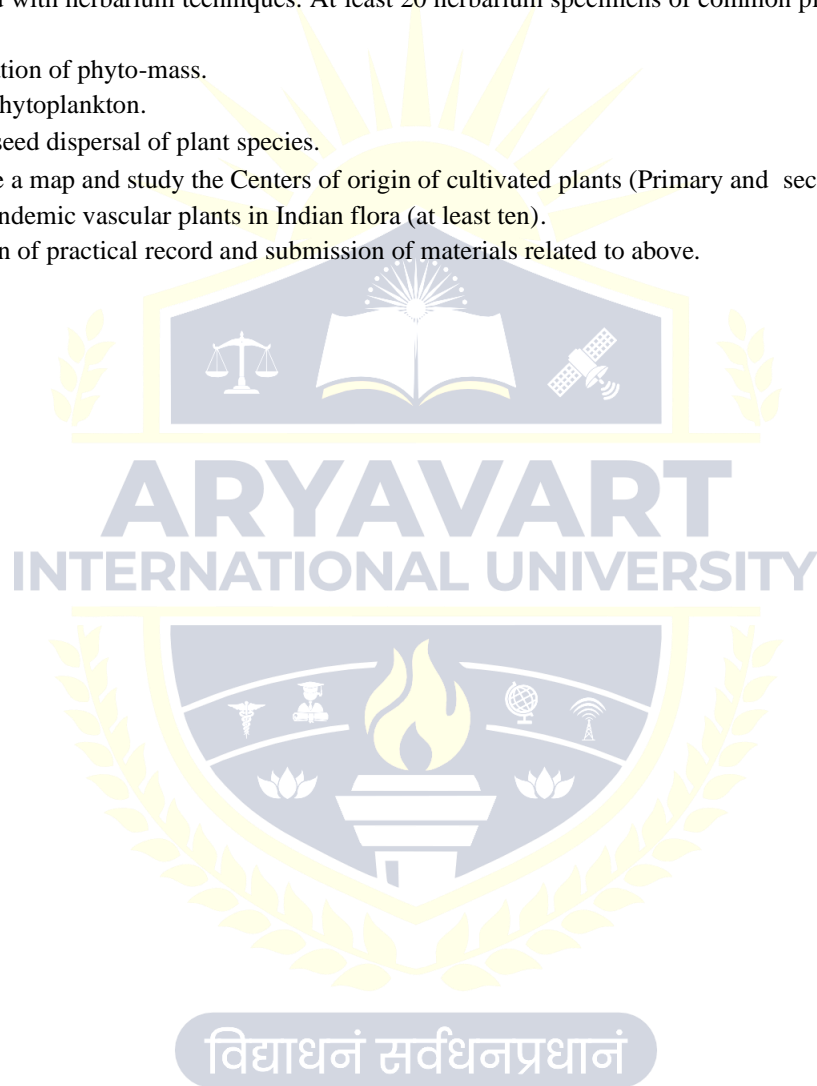
**ANGIOSPERM TAXONOMY & ETHNOBOTANY AND PLANT ECOLOGY,
BIODIVERSITY & CONSERVATION BIOLOGY**

Code: 24BO192

Max. Marks: 70

Contents:

1. Taxonomic study of angiospermic plants with analytical drawings, botanical description, and identification up to the rank of species.
2. Collection and preparation of herbarium specimens to be submitted along with field notebook so as to get acquainted with herbarium techniques. At least 20 herbarium specimens of common plants to be prepared and submitted.
3. Determination of phyto-mass.
4. Study of phytoplankton.
5. Study of seed dispersal of plant species.
6. To prepare a map and study the Centers of origin of cultivated plants (Primary and secondary centers).
7. Study of endemic vascular plants in Indian flora (at least ten).
8. Preparation of practical record and submission of materials related to above.
9. Viva-voce.



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Theory Paper

Total: 100 Marks
External: 70 Marks
Internal: 30 Marks

External: 70 Marks

10 Question (MCQ):1 mark each (1x10=10)
Answer any 6 out of 8(VeryShort20-30Words): 2 marks each (2x6=12)
Answer any 6 out of 8(Short50-70Words): 3 marks each (3x6= 18)
Answer any 6 out of 8(Long100-120Words): 5 marks each (5x6=30)

Internal: 30 Marks

Two Internal Assessment Examinations will be conducted, each carrying 50 marks. The higher of the two scores will be considered for the final assessment.

Practical: 100 Marks
External: 70 Marks
Internal: 30 Marks

External: 70 Marks

Major experiment: 30 Marks
Minor experiments: 20 Marks
Practical Record: 10 Marks
Viva: 10 Marks

Internal Assessment (30 Marks)

Internal Assessment Examinations will be conducted, carrying 50 marks

Major Experiment: 15 Marks
Minor Experiment: 10 Marks
Record: 10 Marks
Attendance: 5 Marks
Viva: 10 Marks

