SIDO KANHU MURMU UNIVERSITY, DUMKA

COURSES OF STUDY

FOUR YEAR UNDERGRADUATE PROGRAMME

B.Sc. BOTANY

SUBJECT CODE: BOT

Implemented from

Academic Session 2022-2026

PROGRAM STRUCTURE & DISTRIBUTION OF MARKS

FOUR YEAR UNDER GRADUATE PROGRAM

Program Structure				Distribution of Marks					
Semester	Paper code	Title of the course	Category of the course	Internal		External		Full Marks	Credit
				FM	PM	FM	PM		
SEM-I	BOT- MJ-1	Microbiology, Algae and Fungi	Major	15	06	60	24	75	04
	BOT- MJ 1 LAB	Practical	Major Practical	-	-	25	10	25	02
	BOT-IRC-1	Microbiology, Plant Pathology, Algae, Fungi, Bryophyta, Pteridophyta & Gymnosperm	Introductory	15	06	60	24	75	02
	BOT-IRC 1 LAB	Practical	Introductory Practical	-	-	25	10	25	01
SEM-II	BOT- MJ-2	Bryophytes, Pteridophytes, Paleobotany and Gymnosperm	Major	15	06	60	24	75	04
	BOT- MJ 2 LAB	Practical	Major Practical	-	-	25	10	25	02
	BOT-IRC-2	Morphology of Angiosperms Plants	Introductory	15	06	60	24	75	02
	BOT-IRC 2 LAB	Practical	Introductory Practical	-	-	25	10	25	01

QUESTION PATTERN & EVALUATION

Internal Evaluation: (15 Marks)	• *Attendance/overall class performance will carry 5 marks.* • *Internal examination 10 marks. (There will be two group of questions. Question No 1 will be very short answer type in Group A consisting of five questions of 1 marks each. Group B will contain descriptive type two questions of five marks each, out of which any one to answer.*
External Evaluation (60 Marks)	• *There will be two group of questions. Group A is compulsory which will contain three questions. Question No. 1 will be very short answer type consisting of five questions of 1 mark each. Question N0. 2 & 3 will be short answer type of 5 marks. Group B will contain descriptive type five questions of fifteen marks each, out of which any three are to answer. There may be subdivisions in each question asked in theory Examinations.*

SEMESTER I

MAJOR COURSE- BOT- MJ-1 **(Credits: Theory-04)**

Total Marks: 75 (15 Marks Internal Examination + 60 Marks End Semester Examination)

Microbiology, Algae and Fungi **Total Credit Hours: 60**

Unit 1: Methods of Microbiology: Staining, Sterilization, Isolation, Culture and Culture media.
Unit 2: Viruses: General account of TMV and Bacteriophage.
Unit 3: Mycoplasma: Structure and reproduction.
Unit 4: Bacteria: General characters, classification, cell structure, reproduction and economic importance.
Unit 5: Cyanobacteria: General characters, classification, cell structure, reproduction and life history of *Nostoc, Oscillatoria and Rivularia.*
Unit 6: Algae: General characters, classification, economic importance and life history of *Volvox,Oedogonium, Chara, Vaucheria* and *Sargassum.*
Unit 7: Fungi: General characters, classification, economic importance and life history of *Phytophthora, Peziza, Puccinia* and *Argicus.*

MAJOR PRACTICAL- BOT- MJ 1 LAB **(Credits: Practical-02)**

Total Marks: 25 (25 Marks End Semester Examination) **Total Credit Hours: 60**

Unit 1: Microbiology: Staining and identification of bacteria. Preparation of PDA Medium.
Unit 2: Cyanobacteria: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Nostoc, Oscillatoria and Rivularia.*
Unit 3: Algae: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Volvox, Oedogonium, Chara, Vaucheria* and *Sargassum.*
Unit 4: Fungi: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Phytophthora, Peziza, Puccinia* and *Argicus.*

Distribution of marks (Practical):

Experiments	:	10 marks
Spotting 05x 1	:	05 marks
Records/Models/Charts/Herbarium/Tour Report	:	05 marks
Viva Voce	:	05 marks

Suggested Readings:

1. Dubey, R.C. & Maheswari, D.K. A Text Book of Microbiology, 2005, S.Chand & Company
2. Biswas, S.B. & Biswas, A. An Introduction to Viruses (4th ed.), 1996, Vikas Publishing House
3. Power, C.B. & Daginawala, H.F. General Microbiology, Vol. I&II, Himalaya Publishing House
4. Sale, A.J. Fundamental Principles of Microbiology, Latest Ed., Tata McGraw Hill
6. Kumar, H.D. Introductory Phycology (2nd ed.), 1999, Affiliated East-West Press Pvt. Ltd.
7. Vashishta, B.R., Sinha, A.K. & Singh, V.P. Algae (9th ed.), 2002, S. Chand & Company
8. Sambamurty, A.S.S. A text book of Algae, 2005, I.K. International Pvt. Ltd. 22
9. Dubey, H.C. An Introduction to Fungi (2nd ed.), 1990, Vikas Publishing House 23
10. Sharma, P.D. Fungi & Allied Organisms, 2005, Narosa Publishing House
11. Sharma, O.P. Text book of Fungi, Tata McGraw Hill
12. Vashista, B.R. Fungi, Latesgt Ed., S. Chand & Company
13. Chopra, G.L. and Verma, V.A. Text Book of Fungi, Pradeep Publications

INDRODUCTORY REGULAR COURSE- BOT-IRC-1 **(Credits: Theory-02)**

Total Marks: 75 (15 Marks Internal Examination + 60 Marks End Semester Examination)

Microbiology, Plant Pathology, Algae, Fungi,
Bryophyta, Pteridophyta & Gymnosperm **Total Credit Hours: 60**

Unit-1 Viruses: General account of TMV and Bacteriophage.
Unit-2 Bacteria: General characters and economic importance.
Unit-3 Plant Pathology: A general account of Citrus Canker, Red rot of sugarcane, Yellow vain mosaic of bhindi and Tikka diseases of ground nut.
Unit-4 Algae: General characters, economic importance and life history of *Volvox*, *Oedogonium*, *Chara*, and *Nostoc*.
Unit-5 Fungi: General characters, economic importance and life history of *Phytophthora &Puccinia.*
Unit-6 Bryophytes: General account, economic importance and life history of *Marchantia*, & *Polytrichium.*
Unit-7 Pteridophytes: General account and life history of *Selaginella, Equisetum & Marsilia* .
Unit-8 Gymnosperm: General account and life history of *Cycas, Pinus& Rhynia.*

INDRODUCTORY REGULAR COURSE PRACTICAL- BOT-IRC 1 LAB (Credits: Practical-01)

Total Marks: 25 (25 Marks End Semester Examination) **Total Credit Hours: 60**

Unit 1: Microbiology: Staining and identification of bacteria.
Unit 2: Plant Pathology: Preparation of temporary slides/permanent slides, enumeration of salient features, identification and host parasite relationship.
Unit 3: Algae: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Volvox*, *Oedogonium*, *Chara*, and *Nostoc.*
Unit 4: Fungi: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Phytophthora* and *Puccinia.*
Unit 5: Bryophytes: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Marchantia*, & *Polytrichium.*
Unit 6: Pteridophytes: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Selaginella, Equisetum & Marsilia.*
Unit 7: Gymnosperm: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Cycas, Pinus& Rhynia.*

Distribution of marks (Practical):

Experiments	:	10 marks
Spotting 05x 1	:	05 marks
Records/Models/Charts/Herbarium/Tour Report	:	05 marks
Viva Voce	:	05 marks

Suggested Readings:

1. Dubey, R.C. & Maheswari, D.K. A Text Book of Microbiology, 2005, S.Chand & Company.
2. Vashishta, B.R., Sinha, A.K. & Singh, V.P. Algae (9th ed.), 2002, S. Chand & Company.
3. Dubey, H.C. An Introduction to Fungi (2nd ed.), 1990, Vikas Publishing House 23.
4. Sharma, O.P. Text book of Fungi, Tata McGraw Hill.
5. Vashista, B.R. Fungi, Latesgt Ed., S. Chand & Company.
6. Rashid, A. An Introduction to Bryophyta, 1998, Vikas Publishing House.
7. Rashid, A. An Introduction to Pteridophyte, Latest Ed., Vani Educational Books.
8. Vashishta, P.C. Gymnosperm, Latest Ed., S. Chand & Company Pvt.
9. Dutta, S.C. An Introduction to Gymnosperms (3rd ed.), 1984, Kalyani Publishers.
10.

SEMESTER II

MAJOR COURSE- BOT-MJ-2 **(Credits: Theory-04)**

Total Marks: 75 (15 Marks Internal Examination + 60 Marks End Semester Examination)

Bryophytes, Pteridophytes, Paleobotany and Gymnosperm **Total Credit Hours: 60**

Unit 1: Bryophytes: General account, classification, progressive sterilization of sporogeneous tissue, economic importance and life history of *Marchantia, Anthoceros, Sphagnum* and *Polytrichium.*

Unit 2: Pteridophytes: General account, anatomy, stellar evolution, heterospory and seed habit and life history of *Psilotum, Selaginella, Equisetum, Marsilia* and *Pteris.*

Unit 3: Fossil: Types, process of fossilization, importance of fossils, geographical time scale, major sites of fossils in Jharkhand.

Unit 4: General account and life history of *Rhynia, Calamites, Lepidodendron, Pentoxylum* and *Williamsonia.*

Unit 5: Gymnosperm: General account, anatomy, reproduction and comparative account of *Cycas, Pinus, Taxus* and *Gnetum.*

MAJOR PRACTICAL- BOT-MJ 2 LAB **(Credits: Practical-02)**

Total Marks: 25 (25 Marks End Semester Examination) **Total Credit Hours: 60**

Unit 1: Bryophytes: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Marchantia, Anthoceros, Sphagnum and Polytrichium.*

Unit 2: Pteridophytes: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Psilotum, Selaginella, Equisetum, Marsilia* and *Pteris.*

Unit 3: Fossils: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Rhynia, Calamites, Lepidodendron, Pentoxylum* and *Williamsonia.*

Unit 4: Gymnosperm: Preparation of temporary slides/permanent slides, enumeration of salient features and identification of *Cycas, Pinus, Taxus* and *Gnetum.*

Distribution of marks (Practical):

Experiments		:	10 marks
Spotting	05x 1	:	05 marks
Records/Models/Charts/Herbarium/Tour Report		:	05 marks
Viva Voce		:	05 marks

Suggested Readings:

1. Parihar, N.S. Introduction to Embryophyta (Vol. 1 Bryophyta), Central Book Distributors
2. Rashid, A. An Introduction to Bryophyta, 1998, Vikas Publishing House
3. Chopra, R.N. & Kumar, P.K. Biology of Bryophyta, Latest Ed., Wiley Eastern
4. Vashista, B.R. Bryophyta, Latest Ed., S. Chand & Company
5. Rashid, A. An Introduction to Pteridophyte, Latest Ed., Vani Educational Books.
6. Vashista, P.C. Pteridophyta, Latest Ed., S. Chand & Company Pvt. Ltd.
7. Agashe, S.N. Palaeobotany, Latest Ed., Oxford & IBH
8. Vashishta, P.C. Gymnosperm, Latest Ed., S. Chand & Company Pvt.
9. Karkar, R.K. & Karkar, R. The Gymnosperms, Latest Ed.
10. Biswas, C. & Johri, P.M. The Gymnosperm, 1997, Narosa Publishing House
11. Dutta, S.C. An Introduction to Gymnosperms (3rd ed.), 1984, Kalyani Publishers

INDRODUCTORY REGULAR COURSE-BOT- IRC-2 **(Credits: Theory-02)**

Total Marks: 75 (15 Marks Internal Examination + 60 Marks End Semester Examination)

Morphology of Angiosperms Plants **Total Credit Hours: 60**

Unit 1: Habit and Habitat

Unit 2: The Root: Definition, type, modification and function.

Unit 3: The Stem: Definition, type, modification and function.

Unit 4: The Leaf: Definition, parts, venation, types, phylotaxy, modification and function.

Unit 5: The Inflorescence: Definition, different types.

Unit 6: The Flower: Definition, position, parts and aestivation.

Unit 7: The Fruit: Definition parts and types.

Unit 8: The Seed: Definition, Structure of dicotyledonous and Monocotyledonous seed.

Unit 9: Pollination: Self & cross.

INDRODUCTORY REGULAR COURSE PRACTICAL-BOT- IRC 2 LAB (Credits: Practical-01)

Total Marks: 25 (25 Marks End Semester Examination) **Total Credit Hours: 60**

Unit 1: Root: Study of root and its modifications
Unit 2: Stem: Study of stem and its modifications
Unit 3: Leaf: Study of leaf and its modifications
Unit 4: Inflorescence: Study of inflorescence
Unit 5: Flowers: Study of flowers
Unit 6: Fruit: Study of fruits
Unit 7: Seed: Study of seed

Distribution of marks (Practical):

Experiments		:	10 marks
Spotting	05x 1	:	05 marks
Records/Models/Charts/Herbarium/Tour Report		:	05 marks
Viva Voce		:	05 marks

Suggested Readings:

1. Ganguli,H.C., Das, K.S.K. & Dutta, C.T. College Botany, Vol. I, latest Ed., New Central Book Agency
2. Ganguli,H.C. and Kar, A.K. College Botany, Vol. II, latest Ed., New Central Book Agency
3. Mukherjee, S. College Botany, Vol. III, latest Ed., New Central Book Agency
4. Sen, S. 1992. Economic Botany, New Central Book Agency, Culcutta.
5. Verma, V. 1974. A Textbook of Economic Botany, Emcay Publication, New Delhi.
6. Hiil, A. 1976. Economic Botany, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
7. Bendre, A., Kumar, A. Economic Botany, Rastogi Publication, New Delhi. India.