MSC SEM-I P-I

COURSE CODE:17.270

Name of Department – Botany

Name of the Course- M.Sc Ist Sem.

Paper Ist –Diversity of Microbes

Course objective (2 or 3 lines):-

a) To explore the mystery of the microboacal world briefly.
b) To know the habit and habitat of the microbes.
c) To know their physiological and bio-chemical behaviour.

Course outcome (minimum 5 points):-

a) The diverse nature of microbes could be explored in the environment.
b) The microbes and their roles for the economic values could be known.
c) The habit and habitat of microbes in the nature could be known which is governed by their cellular organisation.
d) The significance of microbial relationships with other living forms can be justified.
e) The versatile nature of the microbes could be explored as alternatives of living forms.

Text Book:-

1) Diversity of Microbes –Vashishta
2) Fungi – H.C. Dubey
3) The various –R.E.F. Mathews.

MSC SEM-I P-II

COURSE CODE:17.280

Name of Department – Botany

Name of the Course- Algae & Bryophyta (paper II, Sem-I)

Course objective (2 or 3 lines):-

Course deals about the structure and reproduction in details & thalloid plant group found in freshwater and marine habitat and moist terrestrial places.

Course outcome (minimum 5 points):-

1. Students will be able to get the knowledge of thallus organization habit and their distribution worldwide.
2. Students will be able to understand classification on the basis of cellular organization i.e., cell wall, pigment reserve food and flagella etc.
3. Students will be able to understand about life cycle difference on the basis of prokaryotes and eukaryotes from minor thallus organization.
4. Students will be able to get the knowledge about the difference of Algae and Bryophytes under gametophytic level of organization at the structure and reproductive features with their life cycle.

Assessment Method: - Question answer with students by oral.

Text Book:-

1. Algae – C.P. Sharma.
2. College Botany –Kar. Ganguli & Delta.
3. Algae –B.R. Vashistha.
4. Bryophyta –B.R. Vashishta.
5. Peryophytes –N S Parihan.

Reference Book:-

1) Phycology –Fritsch
2) Cryptogamic Botany –Smith.
3) Algae –Chaman & Champaran.
4) Bryophyta –Caves

MSC SEM-I P-III

COURSE CODE:17.290

Name of the Course (paper)- M.Sc Ist Semester

Paper IIIrd - Pteridophyta

Course objective (2 or 3 lines):- The objective of the course is to give students a good overview of the general morphology, sexual reproduction and diversity of the pteridophyta, psilophyta, lycophyta and sphenophyta.

Course outcome (minimum 5 points):- The students will be able to-

1. General characteristic features of Pteridophyta.
2. Discuss about land adaptation of Pteridophyta.
3. Explain Homo & Heterospory.
4. Discuss about stellar evolution.
5. Give detailed account of the morphology and anatomy of

a. Psilopsida –Psilotum.
b. Lycopsida –Lycopodium, Isoetes, selaginella
c. Sphenopsida –Equisetum
d. Pteridopsida –Ophioglossum, Osmunda, Marsilea, Gleichenia & Azolla.

Assessment Method: -

(Ex. Quiz, Class test, Discussment.

Text Book:-

1. Botany for degree students, pteridophytes –by Vasistha P.C., Sinha A.K. & Anil Kumar.
2. A text book of Botany vol. II –B.P. Pandey.

Reference Book:-

1. An Introduction to Pteridophytes, A. Rashid.
2. The Morphology of Pteridophytes _ K.R. Sporne.
3. An Introduction to paleobotany –C.R. Arnold.

MSC SEM-I P-IV

COURSE CODE:17.300

Name of the Course (paper)- M.Sc Ist Semester

Paper IVth - Gymnosperm

Course objective (2 or 3 lines):-

1. To aware the students about very prominent group of plants i.e. gymnosperm.
2. To know the systematic position of different genera in the evolutionary tree.
3. To aware the students about Comparative study of Fossil and living Gymnosperm.

Course outcome (minimum 5 points):-

1. Students to achieve different groups of gymnosperm.
2. Students get Knowledge about systematic position of different genera in evolutionary tree.
3. Students to get knowledge about process of Fossilization and various types of fossils.
4. Students to achieve economic role of Fossils and living gymnosperms.
5. Students get Knowledge about economic role of different Gymnosperm plant in nature.

Assessment Method: -

Essay, Class-test, Project and Debate.

Text Book:-

1. Gymnosperm: HN Srivastava
2. Gymnosperm: Singh Pandey & Jain.

Reference Book:-

1. Gymnosperm: PC Vasistha, Dr AK Sinha, Dr Anil Kumar
2. Gymnosperm –O.P. Sharma

MSC SEM-I P-V

COURSE CODE:17.310

Name of Department – Botany

Name of the Course - M.Sc Ist Semester Practical

Course objective (2 or 3 lines):-

i) To know the Habit and Habitat of Bacteria, viruses, mycoplasma, Fungi, Algae, Bryophyta, Pteridophyta and Gymnosperm.
ii) To aware the students about Role of these diverse group.

Course outcome (minimum 5 points):-

i) The Habit and Habitat of all these pants could be known which is gevern by their cellular organisation.
ii) Significance of Microbial relationship with other living form can be justified.
iii) Role of Bacteria Viruses, mycoplasma, Algae & Fungi could be known.
iv) Internal feature of Bryophyta, Pteridophyta and gymnosperm could be known.

Books-

1. Modern Practical Botany (vol. I, II, III) BP Pandey
2. Practical botany OP Sharma
3. Practical Botany (vol. I, II, III) singh pandey & Jain.

MSC SEM-II P-I

COURSE CODE:17.320

Course Details (M.Sc)

Name of Department – Botany

Name of the Course- Taxonomy of Higher Plants & Economic Botany(Paper- I, Sem-II)

Course objective (2 or 3 lines):-

Course deals about systematic Knowledge of seed plant and their details of morphological characteristics and their economic uses.

Course outcome (minimum 5 points):-

1) Students will be able to get knowledge about scope of Taxonomy of seed plant.
2) Students will be able to develop knowledge of phylogenetic characteristics with evolution in flowering plant.
3) Students will be able to get knowledge of various concept of systematic that help in classification and identification of angiospermic plant.
4) Students will be able to develop their knowledge in plant products, their utilization in human welfare.
5) Students will be able to do plant conservation, their protection of plant yielding products.

Assessment Method: -

Question-answer with students by oral.

Text Book:-

1) Angiosperm –B.P. Pandey
2) Angiosperm –V.N. Naik

Reference Book:-

1) Introduction to plant Taxonarry –BHM Lawrence
2) Flora of UP –JF Dathee.

MSC SEM-II P-II

COURSE CODE:17.330

Name of the Course- M.Sc. IInd Paper-II

Paper: Cell Biology of Plants

Course objective (2 or 3 lines):-

a) To aware the students the cell as basic unit of life through its features.
b) To study the comparative features of different types of cells.
c) To discuss and justify the division of labour inside the cell.

Course outcome (minimum 5 points):-

a) The mystery of the cell as a governing body of the living being could be known.
b) Internal structure of the diff. Cell types could be assigned for their natural habit and habitat.
c) Division of labour for different cell organelles and parts could be known in detail, serving a platform for different possible changes.
d) Different types of cell division in the normal and abnormal conditions could be studied.

Text Book:-

1) Cell biology –C.B. Power.
2) Cell and Molecular Biology –G. Karp
3) Cell and Molecular Bio. –De. Roberties.

MSC SEM-II P-III

COURSE CODE:17.340

M.Sc. Semester IInd

Name of Department – Botany

Name of the Course- genetics (Paper-III)

Course objective (2 or 3 lines):-

To explore the advance knowledge about the structure, functions & regulation of Genes and its role in evolution of crop as well as types of gene, its location on chromo sense and role in recombination.

Course outcome (minimum 5 points):-

1) Students achieve the advance knowledge of structure and function of gene.
2) Students kniw the knowledge about the changes in phenohype and genotype of an organisms due to change in chromosome structure and number and also due to altertain om nucleotide.
3) Students get the advance knowledge of recombination at the level of gene, linkage and crossing over.

Assessment Method: -

Discussion, Quiz, Practical records, Internal Exams, Project work.

Text Book:-

1) Genetics –P.K. Gupta
2) Genetics –Dr. Veer Bala Rastogi

Reference Book:-

1) Gene –Benjamin Lewin
2) Cell and Molecular Biology –De Robertis
3) Genetics -Strickberger

MSC SEM-II P-IV

COURSE CODE:17.350

Name of the Course (paper)- M.Sc. Semester IInd

Paper –IV- Structure, development and reproduction of flowering plants

Course objective (2 or 3 lines):-

To aware students of shoot, root, seed, leaf growth, Male and female gametophyte, pollution and fertilization.

Course outcome (minimum 5 points):-

i) Students knew about Theories of shoot and Root optical meristem.
ii) Students learn about Anomalous characters occours in dicot and monocot root and stem.
iii) Students understand about internal structure of dicot & monocot leaf.
iv) Students understand about development of male and female gametophyte.
v) Student knows about pollination types, mechanisms, fertilization and development of fruit.

Assessment Method: -

Class test, Quiz, Project, Seminar, Class discussion.

Text Book:-

i) Diversity of Angiosperms- Systematic, development and reproduction by prof v. Singh, Dr. P.C Pande, Dr. D.K. Jain.
ii) Structure & reproduction of Angiosperms by R.P. Singh.

Reference Book:-

i) New modern Botany (Plant anatomy & Embryology of Angiosperms by S.K. Gupta.
ii) The Embryology of Angiosperms, 6th eds. by S.S. Bhojwani, S.P. Bhatnagar & P.K. Dantu.
iii) Introduction to the Embryology of Angiosperms by P. Maheshwari.

MSC SEM-II P-V

COURSE CODE:17.360

Name of Department – Botany

Name of the Course (paper)- M.Sc. Semester IInd Practical

Course objective (2 or 3 lines):-

i) To aware the students systematic position of different genera of angiosperms.
ii) To aware the students basic anatomical feature of Angiosperm and their variation which could be seen as anamolous structure in the Root and Stem.
iii) To aware the students a cooperative account of different types of embryo and their development.
iv) To discuss different types of cell division.
v) To aware the students relationship of gene.

Course outcome (minimum 5 points):-

i) Students to achieve systematic Position of different genera with their characteristic.
ii) Students to achieve anamaulus structure of root & stem.
iii) Students to achieve different types of embryo and their development.
iv) Student to achieve different type's cell division in Normal cell.
v) Student to achieve relationship of genes and various characters could be known.

Text Book:-

i) Modern practical botany (vol. I, II, III) BP Pandey.
ii) Practical botany O.P. Sharma.
iii) Practical Botany (vol. I, II, III) singh, pandey & Jain.

MSC SEM-III P-I

COURSE CODE:17.370

Course details (M.Sc)

Name of Department – Botany

Name of the Course- Microbiology (paper-I, Semester IIIrd)

Course objective (2 or 3 lines):-

Course details about microbial world with their domestic and Industrial application for human welfare and their uses.

Course outcome (minimum 5 points):-

1. Students get a diversified knowledge of microbes.
2. Students get knowledge of microbial relationship with Biotechnology and their application.
3. Students also becomes perfect to develop their knowledge of microbial role in various technique used in commercial uses.
4. Students develop their knowledge through this course outcome that how microbes play a role to maintenance of environment.
5. Students will be able to know the microbial support in oriental food production etc.

Text Book:-

1. Microbiology –R.C. Dubey
2. Applied Microbiology –Vashistha & Gills
3. Microbiology –Powar & Daginwala

Reference:-

1. Microbiology –talora & taloro
2. Microbiology –Baltimare

MSC SEM-III P-II

COURSE CODE:17.380

M.Sc Semester IIIrd

Name of Department – Botany

Name of the Course- Plant Physiology (paper-II)

Course objective (2 or 3 lines):-

To explore the advance knowledge of internal functioning of plants also the importance of water in maintaining the structure and metabolic activities of plant life.

Course outcome (minimum 5 points):-

Students get the advance of the followings-

i) Role of green plant as primary producer. Physiology of conversion of radiant energy in to chemical energy by green plants.
ii) Production of energy in plants by various bio molecules and their quantitative measurement.
iii) Role of water & phytohermones in the maintainence of structure and various activities of plant life.
iv) Light dependent plant growth and movement.

Assessment Method: -

Discussion, Quiz, practical records, internal exams, etc.

Text Book:-

1. Plant Physiology & Priochemestry –S.K. Verma & Mohit Verma.
2. Introductory Plant physiology –Noggle & Fritz.

Reference:-

1. Plant Physiology –E. Ziger & L. Teiz.
2. Plant Physiology –Salisbeny & Ross.

MSC SEM-III P-III

COURSE CODE:17.390

Name of the Course- M.Sc Sem. IIIrd

Biochemistry (paper-III)

Course objective (2 or 3 lines):-

The course aims to provide an advanced understanding of the core principles and topics of Biochemistry and their experimental basis and to enable students to acquire a specialised knowledge and understanding of selected aspects.

Course outcome (minimum 5 points):-

1. Discuss the principles of thermodynamics, free energy and chemical potential, Redox-potential.
2. Explain structure and functions of ATP.
3. Give an overview of signal transduction –receptors, and g-proteins, phospholipids signalling, role of cyclic nucleotides.
4. Discuss about structure and function of lipids, fatty and biosynthesis.
5. Explain biological nitrogen fixation in detail.

Assessment Method: -

Group discussion, Class-test, etc.

Text Book:-

1. Text book of Plant Physiology & Biochemestry by S.K. Verma & Mohit Verma.
2. Fundamentals of biochemistry by J.L. Jain.

Reference:-

1. Outlines of Biochemistry –Conn. E.E, stumpf, P.K. and Bruening, G. John Wiley.
2. Biochemistry and molecular biology of Plants –Buchanan B., Gruissem W and Jones, R.

MSC SEM-III P-IV

COURSE CODE:17.400

Name of Department – Botany

Name of the Course- M.Sc Sem. IIIrd

Plant Ecology (paper-IV)

Course objective (2 or 3 lines):-

1) To aware the students about fundamental knowledge about Plant Ecology.
2) To aware the students about various components of environment and Vegetation Development.
3) To aware students role of climate change and their effect.

Course outcome (minimum 5 points):-

1) Students to achieve knowledge of environment including vegetation development.
2) Students get knowledge about analysis of community.
3) Students to achieve Ecosystem stability including ecological perturbation and restoration.
4) Students to get knowledge about flow pathway and ecological efficiency.
5) Students to achieve knowledge climate effect biological system.

Assessment Method: -

Essay, Class-test, project and debate, etc.

Text Book:-

1) Ecology and environment –PD Sharma.
2) Plant Ecology –KN Bhatia

Reference:-

1) Fundamental of ecology –MC Dash
2) Concept of ecology –Kormandy
3) Terrestrial Ecology Barber, Bark and Pits.

MSC SEM-III P-V

COURSE CODE:17.410

Course details (M.Sc, Semester IIIrd)

Name of Department – Botany

Name of the Course- Botany Practical (paper-III)

Course objective (2 or 3 lines):-

Course is dealing about a practical knowledge in the field of Microbiology, plant physiology, Biochemistry & Ecology by hand and field practices.

Course outcome (minimum 5 points):-

1) Students get knowledge identification of microbes preparation and culturing process of various food product (cheese, Buttermilk etc) and study about role of microbiology in water treatment etc.
2) Student will set up an experiment of plant physiology to know factors influence the plant body and their function.
3) Students learn practically about test of various chemical found in plant and plant by treating reagents.
4) Students learn about ecological parameters going in the local field by using various apparatus concern.

MSC SEM-IV P-I

COURSE CODE:17.420

Name of Department – Botany

Name of the Course- M.Sc Sem. IVth

Molecular Biotechnology (paper-I)

Course objective (2 or 3 lines):-

1) To aware the students about Principal of gene cloning and their application on plant.
2) To give knowledge to the students how transgenic plants developed.
3) To aware the students about DNA marker, gene mapping, Genomics, Proteomics.

Course outcome (minimum 5 points):-

1) Students to achieve knowledge about recombinant DNA Technology.
2) Students to achieve the various steps for development of transgenic plants.
3) Students get knowledge about genetic and physical mapping, DNA marker genomics and Proteomics.
4) Students get knowledge about the bioenformance.
5) Students achieve knowledge about Gm plants.

Assessment Method: -

Essay, Class-test, project and debate.

Text Book:-

1) Biotechnology by PK Gupta.
2) A text book of biotechnology by KC Dubey.

Reference:-

1) Biotechnology –TA Brawn
2) Biotechnology –U Satyanarayana
3) Introduction to plant Biotechnology by HS. Chawla.

MSC SEM-IV P-II

COURSE CODE:17.430

Name of the Course- Environmental Biology (paper-II, Semester IVth)

Course objective (2 or 3 lines):-

This course deals an idea about the Nature, their resources and its conservation through sustainability point of view at higher level.

Course outcome (minimum 5 points):-

1) Students will be able to know about the concept of an environment and their component and impact of factors on environment.
2) Students get knowledge of Bio-diversity concept and their utility concern.
3) Students get a vast knowledge of environment and natural resources to their utilization and conservation.
4) Student gets the knowledge of various method to adopt for its conservation in-situ and ex-situ, cryopreservation and seed baulc technique.
5) Student also aware about various agencies and NGOs, government role in conservation.

Assessment Method: -

Asking question-answer with students.

Text Book:-

1) Environmental Biology –P.D. Sharma.
2) Environmental Biology –Asthana & Asthana
3) Environmental Biology –K.C. Agrawal
4) Environmental Biology –B.Mukharjee

Reference:-

1. Ecology and Biodiversity –Odum
2. Environmental Biology –Raven Berg Johanson.
3. Environmental Biology –Karen Arms.

MSC SEM-IV P-III

COURSE CODE:17.440

Name of Department – Botany

Name of the Course(paper)- M.Sc-IVth Semester

Course objective (2 or 3 lines):-

To aware students about, history, symptoms, host pathogen interaction, local plant diseases and their control measures.

Course outcome (minimum 5 points):-

i) Students knew about disease causing entity, types of diseases and work done or contribution of various plant pathologist.
ii) Students studied various disease symptoms caused by microbes.
iii) Students learn how pathogen enters in plant system, how infection occurs, what are enzymes & toxins involved in disease development.
iv) Students learn management of diseases of plants through various ways.
v) Students knew about local diseases of plants caused by pathogen and their control measures.

Assessment Method: -

Quiz, class-test, Records, Class-Discussion, and Project.

Text Book:-

i. Plant Pathology –Pathogen and Plant Disease by Dr. B.P. Pandey.
ii. Plant Pathology by R.P. Singh.

Reference:-

i) Plant pathology, fifth edition by George N. Agries.
ii) Plant disease management by R.S. Singh.
iii) Introduction to Principles of plant Pathology by R.S. Singh.
iv) Plant pathology by P.D. Sharma.
v) Molecular Plant pathology by Matthew Dickinson.

MSC SEM-IV P-IV

COURSE CODE:17.450

Name of the Course- M.Sc IVth Semester

Course objective (2 or 3 lines):-

The objective of the course is to give students advanced knowledge and widening of the knowledge and other course by handling of classical and modern plant biotechnology of classical and modern plant biotechnology, process especially tissue culture.

Course outcome (minimum 5 points):-

The students will be able to-

1) Explain fundamentals of plant cell and tissue culture.
2) Discuss application of plant tissue culture.
3) Give a general account of organogenesis and adventives embryogenesis.
4) Explain Somatic hybridization-Protoplast isolation, Fusion & Culture, hybrid selection and regeneration, possibilities and significance.
5) Discuss cryopreservation & germplasm storage.

Assessment Method: -

Quiz, class-test, Discussion, etc.

Text Book:-

Dubey, R.C. –A text book of biotechnology.

P.K. Gupta –Plant biotechnology.

Reference:-

1) Molecular Biotechnology –Principles and application of recombinant DNA.
2) Plant cell, Tissue and organ culture fundamental methods –Gamborg, OL & Phillips, G.C.

MSC SEM-IV P-V

COURSE CODE:17.460

Course details (M.Sc- Semester IVth)

Name of Department – Botany

Name of the Course- Botany Practical (paper-IV)

Course objective (2 or 3 lines):-

Course deals about the practical knowledge in the field of Molecular Biotechnology, Environmental Biology, Plant Pathology and Tissue culture technique by experiment, seminar and projects.

Course outcome (minimum 5 points):-

1) Students get knowledge by preparation off slide, study Herbarium, section cutting of pathological material of concern syllabus of their locality.
2) Students get knowledge of various parameters of environmental characteristics using by apparatus, instruments in water, soil and Air quality of their surroundings.
3) Students get instruction to do lab/field project work to improve their knowledge in minor research work.
4) Students develop their knowledge of instrumentation culture techniques and preparation artificial products by tissue culture technique like synthetic seed, embryo etc.