Government College for Women, Parade Ground, Jammu

DEPARTMENT OF BOTANY

Botany Syllabus (NEP-2020)

UNDERGRADUATE SEMESTER I AND II

COURSES EFFECTIVE FROM ACADEMIC YEAR 2022-2023

BOTANY

Govt. College for Women, Parade Ground, Jammu

Botany (under CBCS as per NEP-2020)

UG Semester- I

Introduction to the World of Plants

(Multidisciplinary Course)

Course Code: UBOMD101
Credits: 03
Duration of Exam: 2.5 hrs

Maximum Marks: 75
External Examination: 60 Marks
Internal Assessment: 15 Marks

Objectives of the Course:

1. The general objective is to provide the students of Bachelor's programme an opportunity to opt one more course in the interdisciplinary area which helps them to broaden their knowledge.
2. The specific objective is to develop among the students an aptitude towards plant science by addressing the relationship between plants, humans and environment.

Learning outcomes of the course:-

1. Students will be able to develop a conceptual understanding of morphology and structure of plants and importance of Botany.
2. Students will be able to recognize the basic parts of a plant, their functions, and specialized terms.
3. Students will learn about the significance of light in the synthesis of food by green parts of a plant using carbon dioxide and water.
4. Students will get an insight about the cultivation of economically important plants which helps in enhancing the entrepreneurial knowledge.

Scope of the course

The knowledge about plant life shall broaden the overall outlook of the students about significance of plants, and make them confident and informed citizens of the society.

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UG Semester- I

Introduction to the World of Plants

(Multidisciplinary Course)

Course Code: UBOMD101
Credits: 03
Duration of Exam: 2.5 hrs

Maximum Marks: 75
External Examination: 60 Marks
Internal Assessment: 15 Marks

Unit I Plant Morphology **Teaching hours: 12**

1.1 Flowering plants: General account of diversity, grouping of plants on the basis of habit and habitat, concept of dicots and monocots.
1.2 Morphology of flowering plants [root, stem and leaf], significance of each part.
1.3 Common modifications of root, stem and leaf; their uses in brief.
1.4 Flower: General structure, and role in reproduction; Fruits and Seeds.

Unit II Plant Physiology **Teaching hours: 11**

2.1 Water: Properties, and significance to plants; absorption, availability of water in soil for plants.
2.2 Water absorption: Passage of water through plant and loss of water from surface of plants (transpiration); Brief idea and nutrients required (N, P, K and Zn).
2.3 Photosynthesis: Definition, significance, a brief description of synthesis of food.
2.4 Respiration: Definition, significance, types of primary respiratory substrates (carbohydrates, fats, proteins), and concept of energy stored in carbohydrates.

Unit III Plant Utilization **Teaching hours: 11**

3.1 Cereals: General cultivation, nutritive value and uses of wheat, rice and maize.
3.2 Pulses and spices used in day-to-day life: General cultivation of Rajmah, Peas, Onion, Garlic and Coriander.
3.3 Vegetables: Locally available vegetables obtained from roots, stem, leaves, flowers and fruits and their nutritive values.
3.4 Fruits and nuts: Definition, uses and commercial importance of Mango, Litchi, Guava, Almond, Walnut and Groundnut.

Unit IV Cytology and Genetics **Teaching hours: 11**

4.1 Structure of cell, difference between plant and animal cell
4.2 Structure of prokaryotic and eukaryotic cell.
4.3 Concept of hereditary material, a brief account of structure and significance of DNA.
4.4 A brief account of cell divisions, Mendel's Laws of inheritance.

Bibliography

Kochhar SL. 2016. Economic botany. Cambridge University Press.
Brown TA. 2010. Genomes. John Wiley and Sons (Asia) Pvt. Ltd.
Hopkins WG. 2008. Introduction to plant physiology. John Wiley and Sons, Inc New York USA.
Singh BD. 2018. Fundamentals of genetics. Kalyani Publishers.
Johri BM, Srivastava PS. 2013. Reproductive biology of plants. Springer Science & Business Media.
Taiz L, Zeiger E, Møller IM, Murphy A. 2015. Plant physiology and development. Sinauer Associates Incorporated.

Examination pattern

Internal Assessment (15 marks): Internal assessment test shall be conducted after the completion of 40% of the syllabus in a particular course.

Assessment test: 10 marks
Attendance: 5 marks

Pattern for setting internal assessment test paper

The paper shall comprise of three units:-

a) Short answer questions – Attempt two questions of 1 mark each out of three questions(Maximum of 20 words each)
b) Medium answer question - Attempt two questions of 2 marks each out of 3 question (Maximum of 30 words each)
c) Long answer question - Attempt one question out of two questions 4 marks (Maximum of 50 words)
Questions should be set in such a way that the entire syllabus prescribed for the examination is represented

Pattern of External Examination
Duration of the paper: 3/4hour (45 minutes)

Total marks: 60
Time allowed: 2.5 h

The paper shall comprise of 3 units.

a) Short answer questions - 4 questions of 3 marks each. The questions shall be set in such a way that the whole syllabus prescribed for a course is represented. All questions are compulsory.
b) Medium answer questions – 4 questions of 6 marks each (one question shall be asked from each unit). All questions are compulsory
c) Long answer questions:- 4 questions be set from four units, and the students shall be asked to attempt 2 questions only. Each question shall be of 12 marks.

Govt. College for Women, Parade Ground, Jammu

Botany (under CBCS as per NEP-2020)

UG Semester- I

Course title: Diversity in Plant Kingdom

(Major Course)

Course Code: UBOMJT101
Credits: 04
Duration of Exam: 3 hrs

Maximum Marks: 100
External Examination: 80 Marks
Internal Assessment: 20 Marks

Objectives of the course:

1. Acquaint students about the diversity of plants inhabiting the biosphere.
2. Highlight the structural and functional similarities among different groups of plants besides specific distinctiveness.
3. Aware students about the fact that all groups of plants flourish in the biosphere as a continuum and not as discrete units.
4. Understand the evolutionary sequence of plants in the plant kingdom.

Learning outcomes of the course:

The course contents have been designed with the focus on following student specific learning outcomes.

1. The students shall have a thorough understanding of the habit, habitat, structure, function, diversity and similarity of various groups of plants inhabiting different physicochemical, geographical and ecological domains of biosphere.
2. The students shall appreciate the gradual levels of functional and structural complexities of different groups of plants yet retaining the basic framework.
3. Students shall understand reasons for diversity and the evolutionary path of the entities of plant kingdom.
4. Students shall become aware about various microbes, their structure, function and economic significance.

Govt. College for Women, Parade Ground, Jammu

Botany (under CBCS as per NEP-2020)

UG Semester- I

Course title: Diversity in Plant Kingdom

(Major Course)

Course Code: UBOMJT101
Credits: 04
Duration of Exam: 3 hrs

Maximum Marks: 100
External Examination: 80 Marks
Internal Assessment: 20 Marks

Unit-1 Origin and diversification of plants

1.1 Introduction to origin of life with emphasis on chemical theory.
1.2 Ancestor of land plants: General account and early transition to land environment.
1.3 Classification of organisms: General account and five kingdom system. General characteristics of cryptogams and phanerogams.
1.4 Diversity of plants: Diversity in habit, habitat and life cycle.

Unit - II Microbial diversity

2.1 Viruses: Discovery, structure and biological features of DNA (T-phage) pathways and RNA viruses (TMV); Brief account of viriods and prions.
2.2 Viruses: Role in production of vaccines, research, medicine and diagnostics; Causal organisms of plant diseases (Yellow mosaic disease of Okra). Bacteria: Economic Importance of bacteria in agriculture, industry and medicine and as a causal organism of plant disease (Citrus Canker).
2.3 Introduction to Bacteria: general characteristics, nutrition, cell structure and reproduction.
2.4 Genetic recombination in bacteria (transformation, transduction and conjugation).

Unit- III Diversity of Algae and Fungi

3.1 Algae: Occurrence, habitat, range of thallus and cell structure, reproduction (in general), and economic importance.
3.2 Fungi: Occurrence, general characteristics, cell structure and general reproduction, concept of parasexuality; economic importance in brief.
3.3 Lichens: General characteristics, habit, habitat and economic importance.
3.4 Mycorrhiza: general account, types and significance.

Unit- IV Diversity of Bryophytes and Pteridophytes

4.1 Bryophytes: Occurrence, General characteristics and range of thallus structure.
4.2 Bryophytes: General reproduction and life cycle patterns; ecological and economic importance.
4.3 Pteridophytes: Occurrence, general characteristics, morphology and affinities with

bryophytes.

4.4 Pteridophytes: General reproduction, life cycle and economic importance (in brief).

Unit-5 Diversity of Gymnosperms and Angiosperms

5.1 Gymnosperms: Occurrence, general characters, morphology and affinities with pteridophytes and angiosperms.

5.2 Gymnosperms: General reproduction and life cycle and economic importance.

5.3 Angiosperms: General characters, monocots and dicots, life forms and adaptations.

5.4 Angiosperms: Modes of reproduction, life cycles.

Bibliography:

1. Kumar HD 1999. Introductory phycology. Affliated Est-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Tortora GJ, Funke BR, Case CL 2010. Microbiology: an introduction, Pearson Benjamin Cummings, U.SA. 10th edition.
3. Alexopoulous CJ, Mims CW, Blackwell M 1996. Introductory Mycology, John wiley and sons (Asia) Singapore. 4th edition.
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5. Bhatnagar SP and Moitra A 1996. Gymnosperms. New age international (P) Ltd. Publishers, New Delhi, India.
6. Parihar NS 1991. An introduction to Embryophyta. Vol. 1. Bryophyta. Central Book Depot, Allahabad.
7. Anderson RA 2005. Algal culturing Techniques. Physiological Society of America. Elsevier Academic Press, USA.
8. Cole KM and Sheath RG 1990. Biology of the Red Algae. Cambridge Univ. Press, Cambridge.
9. Fritsch FE 1945. The structure and reproduction of algae. Vol. II. Cambridge Univ. Press. Cambridge, London.
10. Isabella AA, George J and Hollenhberg 1993. Marine Algae of California. Stanford University Press. USA.
11. Lee RE 1989. Phycology. Vol. II. Cambridge Univ. Press. Cambridge, USA.
12. Sahoo D and Qasim SZ 2002. Sustainable Aquaculture. APH Publishing Corporation, New Delhi, India.
13. South GR and Whittick A 1987. Inroduction to phycology. Blackwell Scientific Publications, London.
14. Shaw AJ and Goffinet B 2000. Bryophyte Biology, Cambridge University Press.
15. Geissler and Greene SW 1982. Bryophyte taxonomy, methods, practices and floristic explorations. J Cramer, Germany.
16. Dyer AF 1979. The experimental Biology of ferns. Academic London.
17. Richardson DHS 1981. The biology of mosses. John Wiley & Sons, Inc New York.

18. Singh H 1978. Embryology of gymnosperms. Encyclopedia of Plant Aatomy. Vol X, Gebruder Borntraegrl, Berlin, Sttutgart.
19. Presscot L, Harley J and Klein D. 2005. Microbiolgy, 6th edition, Mc Graw-Hill.
20. Singh VP and Stapleton RD 2002. Biotransformations: Bioremediation Technology for health and environmental protection. Progress in industrial microbiology Vol. 36, Elsevier Science.
21. Subba Rao NS 1982. Advances in agriculture microbiology, Butterworth-Henemann.
22. Subba Rao NS and Dommergues YR 2001. Microbial interactions in agriculture and forestry Vol. 2, Science Pub. Inc.
23. Wiates MJ, Morgan NL, Rockey JS and Higton G 2001. Industrial microbiology: An introduction, Wiley-Blackwell.

Examination pattern

Internal Assessment (20 marks): Internal assessment test shall be conducted after the completion of 40% of the syllabus in a particular course.

Assessment test: 15 Marks
Attendance: 5 marks

Examination pattern shall be as under:-
Pattern for setting internal assessment test paper

The paper shall comprise of three units:-
a) Short answer questions – Attempt two questions of 2 marks each out of three questions (Maximum of 30 words each)
b) Medium answer question - Attempt two questions of 3 marks each out of 3 questions (Maximum of 50 words each)
c) Long answer question - Attempt one question out of two questions 5 marks (Maximum of 100 words)
Note: - Questions shall be set in such a way that the syllabi prescribed for the examination is fully represented

Duration of the paper: - 1hour
Pattern of External Examination

Total marks: - 80
Time allowed: - 3 hours
The paper shall comprise of 3 units.
a) Short answer questions - 5 questions of 3 marks each (one question shall be asked from each unit). All questions are compulsory
b) Medium answer questions – 5 questions of 7 marks each (one question shall be asked from each unit) .All questions are compulsory
c) Long answer questions: - 5 questions are set from five units, and the students shall be asked to attempt 2 questions only. Each question shall be of 15 marks.

BOTANY

(Semester-1)

Practicals

Title: Diversity in Plant Kingdom and Life forms

Course Code: UBOMJP101
Credits: 02
Duration of Exam: 3 hrs

Maximum Marks: 50
External Examination: 25 Marks
Internal Examination: 25 Marks

Suggested laboratory exercises

1. Study of diversity in thallus forms of algae: Cyanophyceae, Chlorophyceae, Xanthophyceae, Phaephyceae and Rhodophyceae through temporary mounts, specimens and permanent slides.
2. Study of various types of fungi and Lichens through temporary mounts or available specimens.
3. Study of various types of Bryophytes and Pteridophytes using live or preserved specimens.
4. Identification of various types of gymnosperms by using specimens.
5. Identification of various forms of angiosperms with respect to monocots and dicots from local flora.
6. Electron micrographs/Models of viruses.
7. Types of Bacteria from temporary/permanent slides/photographs by Gram staining technique. Electron micrograph of bacterial reproduction, Binary fission, conjugation.
8. To study different types of Mycorrhizal associations using permanent slides.

Govt. College for Women, Parade Ground, Jammu

Botany (under CBCS as per NEP-2020)

UG Semester- I

Course title: Plant Kingdom and diversity

(Minor Course)

Course Code: UBOMNT101
Credits: 04
Duration of Exam: 3 hrs

Maximum Marks: 100
External Examination: 80 Marks
Internal Assessment: 20 Marks

Objectives of the course:

1. Acquaint students about the diversity of plants inhabiting the biosphere.
2. Highlight the structural and functional similarities among different groups of plants besides specific distinctiveness.
3. Aware students about the fact that all groups of plants flourish in the biosphere as a continuum and not as discrete units.
4. Understand the evolutionary sequence of plants in the plant kingdom.

Learning outcomes of the course:

The course contents have been designed with the focus on following student specific learning outcomes.

1. The students shall have a thorough understanding of the habit, habitat, structure, function, diversity and similarity of various groups of plants inhabiting different physicochemical, geographical and ecological domains of biosphere.
2. The students shall appreciate the gradual levels of functional and structural complexities of different groups of plants yet retaining the basic framework.
3. Students shall understand reasons for diversity and the evolutionary path of the entities of plant kingdom.
4. Students shall become aware about various microbes, their structure, function and economic significance.

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Botany (under CBCS as per NEP-2020)

UG Semester- I

Course title: Plant Kingdom and diversity

(Minor Course)

Course Code: UBOMJT101
Credits: 04
Duration of Exam: 3 hrs

Maximum Marks: 100
External Examination: 80 Marks
Internal Assessment: 20 Marks

Unit-1 Origin and diversification of plants

1.1 Introduction to origin of life with emphasis on chemical theory.
1.2 Ancestor of land plants: General account and early transition to land environment.
1.3 Classification of organisms: General account and five kingdom system. General characteristics of cryptogams and phanerogams.
1.4 Diversity of plants: Diversity in habit, habitat and life cycle.

Unit - II Microbial diversity

2.1 Viruses: Discovery, structure and biological features of DNA (T-phage) pathways and RNA viruses (TMV); Brief account of viriods and prions.
2.2 Viruses: Role in production of vaccines, research, medicine and diagnostics; Causal organisms of plant diseases (Yellow mosaic disease of Okra). Bacteria: Economic Importance of bacteria in agriculture, industry and medicine and as a causal organism of plant disease (Citrus Canker).
2.3 Introduction to Bacteria: general characteristics, nutrition, cell structure and reproduction.
2.4 Genetic recombination in bacteria (transformation, transduction and conjugation).

Unit- III Diversity of Algae and Fungi

3.1 Algae: Occurrence, habitat, range of thallus and cell structure, reproduction (in general), and economic importance.
3.2 Fungi: Occurrence, general characteristics, cell structure and general reproduction, concept of parasexuality; economic importance in brief.
3.3 Lichens: General characteristics, habit, habitat and economic importance.
3.4 Mycorrhiza: general account, types and significance.

Unit- IV Diversity of Bryophytes and Pteridophytes

4.1 Bryophytes: Occurrence, General characteristics and range of thallus structure.
4.2 Bryophytes: General reproduction and life cycle patterns; ecological and economic importance.

4.3 Pteridophytes: Occurrence, general characteristics, morphology and affinities with bryophytes.

4.4 Pteridophytes: General reproduction, life cycle and economic importance (in brief).

Unit-5 Diversity of Gymnosperms and Angiosperms

5.1 Gymnosperms: Occurrence, general characters, morphology and affinities with pteridophytes and angiosperms.

5.2 Gymnosperms: General reproduction and life cycle and economic importance.

5.3 Angiosperms: General characters, monocots and dicots, life forms and adaptations.

5.4 Angiosperms: Modes of reproduction, life cycles.

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Examination pattern

Internal Assessment (20 marks): Internal assessment test shall be conducted after the completion of 40% of the syllabus in a particular course.

Assessment test: 15 Marks
Attendance:5 marks

Examination pattern shall be as under:-
Pattern for setting internal assessment test paper

The paper shall comprise of three units:-
a) Short answer questions – Attempt two questions of 2 marks each out of three questions (Maximum of 30 words each)
b) Medium answer question - Attempt two questions of 3 marks each out of 3 questions (Maximum of 50 words each)
c) Long answer question - Attempt one question out of two questions 5 marks (Maximum of 100 words)
Note: - Questions shall be set in such a way that the syllabi prescribed for the examination is fully represented

Duration of the paper: - 1hour
Pattern of External Examination:

Total marks: - 80
Time allowed: - 3 hours
The paper shall comprise of 3 units.
a) Short answer questions - 5 questions of 3 marks each (one question shall be asked from each unit) .All questions are compulsory
b) Medium answer questions – 5 questions of 7 marks each (one question shall be asked from each unit) .All questions are compulsory
c) Long answer questions: - 5 questions are set from five units, and the students shall be asked to attempt 2 questions only. Each question shall be of 15 marks.

BOTANY

(Semester-1)

Practicals

Title: Diversity in Plant Kingdom and Life forms

Course Code: UBOMNP101
Credits: 02
Duration of Exam: 3 hrs

Maximum Marks: 50
External Examination: 25 Marks
Internal Examination: 25 Marks

Suggested laboratory exercises

1. Study of diversity in thallus forms of algae: Cynophyceae, Chlorophyceae, Xanthophyceae, Phaeophyceae and Rhodophyceae through temporary mounts, specimens and permanent slides.a
2. Study of various types of fungi and lichens through temporary mounts or available specimens.
3. Study of various types of bryophytes and pteridophytes using live or preserved specimens.
4. Identification of various types of gymnosperms by using specimens.
5. Identification of various forms of angiosperms with respect to monocots and dicots from local flora.
6. To study structure of viruses using electron micrographs/models.
7. To study the types of bacteria from temporary/permanent slides/photographs by Gram staining technique.
8. To study bacterial reproduction (binary fission, conjugation) using electron micrograph.

Govt. College for Women, Parade Ground, Jammu

Botany (under CBCS as per NEP-2020)

UG Semester- II

Course title: Utilization of plants for human welfare

(Major Course)

Course Code: UBOMJT201
Credits: 04
Duration of Exam: 3 hrs

Maximum Marks: 100
External Examination: 80 Marks
Internal Assessment: 20 Marks

Objectives of the course:

The aim of this course is to acquaint the students about plant resources, their sustainable utilization and conservation.

Learning outcomes of the course:

The course will enable the students to understand the origin, domestication and utilization of different economically important plants being used as food fodder, spices, medicine and beverages. This knowledge will awaken the students about the need

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Botany (under CBCS as per NEP-2020)

UG Semester- II

Course title: Utilization of plants for human welfare

(Major Course)

Course Code: UBOMJT201
Credits: 04
Duration of Exam: 3 hrs

Maximum Marks: 100
External Examination: 80 Marks
Internal Assessment: 20 Marks

Unit-I Agriculture and human settlement

1.1 Plants in human welfare: General account, role of agriculture in shaping human history.
1.2 Origin of cultivated plants: Concept of centers of origin with reference to Vavilov's work.
1.3 Crop domestication: Concept, process and co-evolution, loss of genetic diversity, importance of germplasm diversity.
1.4 Ethnobotany: Concept, methodologies used and importance of ethnobotanical studies.

Unit-II Cereals, Pulses, Spices and Beverages

2.1 Cereals: Origin of wheat, rice and maize, evolution, morphology, uses and post harvest processing; Brief account of pseudo cereals.
2.2 Pulses: Morphology, distribution and cultivation of urd, rajmash and black gram in India, their importance to man and ecosystem.
2.3 Spices and venerated plants: Enumeration of locally grown spices; Botany and uses of cumin, fennel, turmeric and clove; Cultivation and commercial value of saffron; Concept of tulsi, bael, peganum and peepal and cultural sanctity.
2.4 Beverages: Morphology, processing and uses of tea and coffee.

Unit-III Vegetables, Fruits, Nuts and Medicinal plants

3.1 Vegetables: Botany, cultivation and uses of potato, tomato and onion.
3.2 Fruits: Morphology, distribution, cultivation and uses of mango and apple, commercial importance and value addition.
3.3 Nuts: Distribution of Walnut and Almonds in J&K, uses and commercial importance.
3.4 Medicinal plants: A brief history of traditional Indian System of Medicine based on plants and plant products. Medicinal uses, part used and methods of usage of *Withania somnifera, Rauwolfia serpentina, Azadiracta indica,* and *Cannabis indica*.

Unit-IV Oils, Fibres, and Forest Products

4.1 Vegetable oils: Botany, cultivation and utility of mustard, ground nut and sunflower oil crops; Composition and health benefits.
4.2 Fibres: Botany, cultivation and processing of cotton and Jute

4.3 Forest products: Cultivation and uses of Bamboo; Important timber yielding plants of J&K; commercial importance of willows and poplars.

4.4 Essential oils: General account, extraction methods and, uses of Rose, Lemon grass, Lavender.

Unit V. Fruits and vegetables preservation

5.1 Sugars: Cultivation of cane sugar and beet root processing and commercial importance.

5.2 Food adjuncts: Cultivation, processing, grading and commercial importance of anardana; source and uses of timbroo.

5.3 Techniques of fruits and vegetables preservation: Scientific drying, Salting, Pickle making and associated value additions.

5.4 Eco-friendly agricultural practices: Concept of organic farming, its importance and scope in J&K; Concept, procedure and benefits of Green house/Polyhouse farming and roof top gardening.

Examination pattern

Internal Assessment (20 marks): Internal assessment test shall be conducted after the completion of 40% of the syllabus in a particular course.

Assessment test: 15 Marks
Attendance: 5 marks

Examination pattern shall be as under:-

Pattern for setting internal assessment test paper

The paper shall comprise of three units:-

a) Short answer questions – Attempt two questions of 2 marks each out of three questions (Maximum of 30 words each)

b) Medium answer question - Attempt two questions of 3 marks each out of 3 questions (Maximum of 50 words each)

c) Long answer question - Attempt one question out of two questions 5 marks (Maximum of 100 words)

Note: - Questions shall be set in such a way that the syllabi prescribed for the examination is fully represented.

Duration of the paper: - 1hour

Pattern of External Examination:

Total marks: - 80 **Time allowed: -** 3 hours

The paper shall comprise of 3 units.

a) Short answer questions - 5 questions of 3 marks each (one question shall be asked from each unit) .All questions are compulsory

b) Medium answer questions – 5 questions of 7 marks each (one question shall be asked from each unit) .All questions are compulsory

c) Long answer questions: - 5 questions are set from five units, and the students shall be asked to attempt 2 questions only. Each question shall be of 15 marks.

BOTANY

(Semester- II)

Practicals

Course title: Utilization of plants for human welfare

Course Code: UBOMJP201
Credits: 02
Duration of Exam: 3 hrs

Maximum Marks: 50
External Examination: 25 Marks
Internal Examination: 25 Marks

Suggested laboratory exercises

1. To study of the morphology, and structure of wheat and maize (grains).
2. Microscopic examination of starch in potato, wheat, maize and rice.
3. To study the fruit and seed structure (section cutting) of black moong, rajmash.
4. To study the morphology and section cutting of cumin (seeds), fennel (seeds), coriander (seeds), turmeric (rhizome), clove (buds).
5. To study of morphology of coffee beans.
6. To study of morphology of tea leaves.
7. To study oil droplets in ground nut and mustard.
8. To study oil droplets in sunflower and coconut.
9. To study the morphology of cotton fibre and test for presence of cellulose.
10. To demonstrate the extraction of essential oil from lemon grass and lavender oil.
11. To study the morphology of medicinal plants mentioned in the syllabi.
12. To demonstrate the techniques of preservation of fruits.
13. To demonstrate the technique of traditional fermentation.
14. To demonstrate the establishment of vermicomposting unit.
15. To demonstrate the procedure for the establishment of rooftop gardening.

Govt. College for Women, Parade Ground, Jammu

Botany (under CBCS as per NEP-2020)

UG Semester- II

Course title: Plants and human welfare

(Minor)

Course Code: UBOMNT201
Credits: 04
Duration of Exam: 3 hrs

Maximum Marks: 100
External Examination: 80 Marks
Internal Assessment: 20 Marks

Objectives of the course:

The aim of this course is to acquaint the students about plant resources, their sustainable utilization and conservation.

Learning outcome of the course:

The course will enable the students to understand the origin, domestication and utilization of different economically important plants being used as food fodder, spices, medicine and beverages. This knowledge will awaken the students about the need

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Botany (under CBCS as per NEP-2020)

UG Semester- II

Course title: Plant and human welfare

(Minor)

Course Code: UBOMNT201
Credits: 04
Duration of Exam: 3 hrs

Maximum Marks: 100
External Examination: 80 Marks
Internal Assessment: 20 Marks

Unit I Agriculture and human settlement

1.1 Plants in human welfare: General account, role of agriculture in shaping human history.

1.2 Origin of cultivated plants: Concept of centers of origin with reference to Vavilov's work.

1.3 Crop domestication: Concept, process and co-evolution, loss of genetic diversity, importance of germplasm diversity.

1.4 Ethnobotany: Concept, methodologies used and importance of ethnobotanical studies.

Unit II Cereals, Pulses, Spices and Beverages

2.1 Cereals: Origin of wheat, rice and maize, evolution, morphology, uses and post harvest processing; Brief account of pseudo cereals.

2.2 Pulses: Morphology, distribution and cultivation of urd, rajmash and black gram in India, their importance to man and ecosystem.

2.3 Spices and venerated plants; Enumeration of locally grown spices; Botany and uses of cumin, fennel, turmeric and clove. Cultivation and commercial value of saffron. Concept of Tulsi, Bael, Peganum and Peepal and cultural sanctity.

2.4 Beverages: Morphology, processing and uses of tea and coffee.

Unit III Vegetables, Fruits, Nuts and Medicinal plants

3.1 Vegetables: Botany, cultivation and uses of potato, tomato and onion.

3.2 Fruits: Morphology, distribution, cultivation and uses of Mango and Apple, commercial importance and value addition.

3.3 Nuts: Distribution of Walnut and Almonds in J&K, uses and commercial importance.

3.4 Medicinal plants: A brief history of traditional Indian System of Medicine based on plants and plant products. Medicinal uses, part used and methods of usage of *Withania, Rauwolfia, Azadiracta,* and *Cannabis* species.

Unit IV Oils, fibres, and forest products

4.1 Vegetable oils: Botany, cultivation and utility of Mustard, Ground nut and Sunflower oil crops; Composition and health benefits.

4.2 Fibres: Botany, cultivation and processing of cotton and Jute

4.3 Forest products: Cultivation and uses of Bamboo; Important timber yielding plants of J&K; commercial importance of willows and poplars.

4.4 Essential oils: General account, extraction methods and, uses of Rose, Lemon grass, Lavender.

Unit V Fruits and vegetables preservation

5.1 Sugars: Cultivation of cane sugar and beet root processing and commercial importance.

5.2 Food adjuncts: cultivation, processing, grading and commercial importance of Anardana; source and uses of Timbroo, food fortification

5.3 Techniques of fruits and vegetables preservation: Scientific drying, Salting, Pickle making and associated value additions.

5.4 Eco-friendly agricultural practices: Concept of organic farming, its importance and scope in J&K; Concept, procedure and benefits of Green house/Polyhouse farming and roof top gardening.

Examination pattern

Internal Assessment (20 marks): Internal assessment test shall be conducted after the completion of 40% of the syllabus in a particular course.

Assessment test: 15 Marks
Attendance:5 marks

Examination pattern shall be as under:-

Pattern for setting internal assessment test paper

The paper shall comprise of three units:-

a) Short answer questions – Attempt two questions of 2 marks each out of three questions (Maximum of 30 words each)

b) Medium answer question - Attempt two questions of 3 marks each out of 3 questions (Maximum of 50 words each)

c) Long answer question - Attempt one question out of two questions 5 marks (Maximum of 100 words)

Note: - Questions shall be set in such a way that the syllabi prescribed for the examination is fully represented

Duration of the paper: - 1hour

Pattern of External Examination:

Total marks: - 80 **Time allowed: -** 3 hours

The paper shall comprise of 3 units.

a) Short answer questions - 5 questions of 3 marks each (one question shall be asked from each unit) .All questions are compulsory

b) Medium answer questions – 5 questions of 7 marks each (one question shall be asked from each unit) .All questions are compulsory

c) Long answer questions: - 5 questions are set from five units, and the students shall be asked to attempt 2 questions only. Each question shall be of 15 marks.

BOTANY

(Semester-1I)

Practicals

Course title: Plants for human welfare

Course Code: UBOMNP201
Credits: 02
Duration of Exam: 3 hrs

Maximum Marks: 50
External Examination: 25 Marks
Internal Examination: 25 Marks

Suggested laboratory exercises

1. To study of the morphology, and structure of wheat and maize (grains).
2. Microscopic examination of starch in potato, wheat, maize and rice.
3. To study the fruit and seed structure (section cutting) of Black moong, Rajmash.
4. To study the morphology and section cutting of Cumin (seeds), Fennel (seeds), Coriander (seeds), Turmeric (rhizome), Clove (buds).
5. To study of morphology of coffee beans.
6. To study of morphology of tea leaves.
7. To study oil droplets in ground nut and mustard.
8. To study oil droplets in sunflower and coconut.
9. To study the morphology of cotton fibre and test for presence of cellulose.
10. To demonstrate the extraction of essential oil from lemon grass and lavender oil.
11. To study the morphology of medicinal plants mentioned in the syllabi.
12. To demonstrate the techniques of preservation of fruits.
13. To demonstrate the technique of traditional fermentation.
14. To demonstrate the establishment of vermicomposting unit.
15. To demonstrate the procedure for the establishment of rooftop gardening.