



हिमाचल प्रदेश केंद्रीय विश्वविद्यालय

Central University of Himachal Pradesh

(Established under Central Universities Act 2009)

अस्थाई शैक्षणिक खण्ड, शाहपुर, जिला काँगड़ा, हिमाचल प्रदेश - 176206

Temporary Academic Block, Shahpur, Distt. Kangra (HP) - 176206

Website: www.cuhimachal.ac.in

SEMESTER-I

Course Code: PLS 401 Course Name: Fundamentals of Phycology and Mycology

Credits = 02

Objectives:

- To familiarize the students the habitats, classification, structure, life cycle and evolutionary trends of Algae, Fungi and Lichen

Phycology

1. Principles and modern trends in taxonomy of algae; Contributions of Indian Algologists
2. Classification of Algae (Fritsch F. E. 1935. Characteristic features of major Divisions.
3. Thallus organization and its morphological variations; Evolutionary trends
4. Ecological role of Algae.
5. Cell structure – Prokaryotic, mesokaryotic and eukaryotic organizations.
6. Structure, reproduction and life cycle of the following types:
Draparnaldiopsis, Cephaleuros, Nitella, Gracilaria
7. Economic importance of Algae- Algae as biofuel. Algae as biofertilizers, as food, their uses in industry, water blooms and their ecological role.

References

1. Lee, R. E. 2018. Phycology 5th Edition. Cambridge University Press, New Delhi.
2. Barsanti, L. & Gualtieri, P. 2014. Algae: Anatomy, Biochemistry, and Biotechnology, 2nd Edition. CRC Press.
3. Sharma, O. P. 2011. Text book of Algae. Tata McGraw Hill Publ. Comp. Ltd. New Delhi.
4. Bilgarmi, K. S & Saha, L. C. 2010. A Textbook of Algae. CBS Publishers, New Delhi.
5. Kumar, H. D. 1999. Introductory Phycology. East West Pvt. Ltd., New Delhi.
6. Vashishta, B. R. 1999. Algae. S. Chand & Company, New Delhi.
7. Bold, H. C. & Wynne, M. J. 1995. Introduction to Algae. Prentice Hall of India, New Delhi.
8. Kashyap, A. K. & Kumar, H. D. 1994. Recent advances in Phycology. Rastogy & Company.
9. Prescott, G. W. 1984. The Algae: A review. Lubrecht & Cramer Ltd.
10. Round, F. E. 1984. The Ecology of Algae. Cambridge University, Press, London.
11. Smith, G. M. 1976. Cryptogamic Botany Vol.1. Tata Mc Graw Hill Publ. Comp. Ltd. New Delhi.
12. Gangulee, H. C. & Kar, A. K. 1973. College Botany, Vol. I. New Central Book Agency Pvt. Ltd.
13. Fritsch F. E. 1935, 48. Structure and reproduction of algae. Cambridge University Press.

MYCOLOGY and LICHENOLOGY

1. Principles and modern trends of classification of Fungi- - (Alexopoulos *et al.* 1996)
2. Contributions of Indian Mycologists.
3. Thallus structure, reproduction and life cycle of the following types:
Pilobolus, Aspergillus, Polyporus Fusarium.
4. Economic importance of fungi with special reference to secondary metabolites; Fungi as biocontrol agent.



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SEMESTER-I

5. . Classification, thallus structure, Economic reproduction, ecological significance and importance of Lichens. Thallus structure, reproduction and life cycle of the following type: Graphis.

Reference

1. Sharma , O. P. 2017. Fungi and Allied Microbes. McGraw Hill Education
2. Dube, H. C. 2013. An Introduction to Fungi. 4th Edition. Scientific Publishers, India.
3. Kirk, P., Cannon P.F., Minter D.W. & Stalpers J. A. 2008. Ainsworth & Bisby's Dictionary of Fungi. 10th Edition. CAB International, Oxon UK.
4. Alexopoulose, C. J., Mims, C.W. & Blackwell, M. 2007. Introductory Mycology. 4th Edn. John Wiley & Sons, New York.
5. Sharma, O. P. 2007. Text book of Fungi. Tata McGraw Hill, Publishing Co. Ltd. New Delhi.
6. Sumbali, G. 2005. The Fungi. Narosa Publishing House, New Delhi.
7. Sharma, P. D. 2004. The Fungi for University students. Rastogi Publications, Meerut.
8. Kirk, P. M., Cannon, P. F., David, J. C. & Stalpers, J. A. 2001. Ainsworth & Bisby's Dictionary of the Fungi, 9th Edition. CABI Publishing.
9. Chopra, G.L. 1998. A text book of Fungi. S. Nagin & Co. Meerut.
10. Srivastava, J. P. 1998. Introduction to Fungi. Central Book Depot, Allahabad.
11. Elizabeth Moore-Landeecker. 1996. Fundamentals of Fungi. Prentice Hall, New Jersey.
12. Mehrothra, R.S. & Aneja, K. R. 1990. An Introduction to Mycology. Wiley Eastern Ltd. New Delhi.
13. Hudson, H. J. 1986. Fungal Biology. Edward Arnold, London.
14. Moore, D., Casselton L.A. Wood D.A. & J. C. Frankland 1986. Developmental Biology of higher fungi. Cambridge University Press
15. Hale, M. E. 1983. Biology of Lichens. Edward Arnold, London.
16. Bessy, E. A. 1979. Morphology and Taxonomy of Fungi. Vikas Publishing House, New Delhi.
17. Ainsworth, G.C., Sparrow, K.E. & Sussman, A.S. 1973. The Fungi. Academic Press, New York.
18. Burnett, J. H. 1968. Fundamentals of Mycology. Edward Arnold Ltd. London.



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SEMESTER-I

**Course Code: PLS 402 Course Name: Bryophytes, Pteridophytes and Gymnosperms
Credits = 02**

Objectives

- To impart basic knowledge about geographical distribution , classification ,structure ,life history and phylogeny of Bryophytes, Pteridophytes and gymnosperms.
- To give an idea about their ecological role and economically important products obtained from them and their uses.
- To familiarize the fossil members of these groups.

A. BRYOPHYTA

1. General characters of Bryophytes
2. Recent systems of classification (Shofield, 1985)
3. Life cycle study of the following types
Lunularia, , Pallavicinia, Porella, , Polytrichum
4. Origin and evolution of Bryophytes, brief account on Fossil Bryophytes
5. Economic importance of Bryophytes, Bryophytes as indicators of water and air pollution

References

1. Botanical Survey of India. 2016. Liverworts and Hornworts of India – An annotated check list.
2. Vanderpoorten A. & Goffinet B. 2009. Introduction to Bryophytes. Cambridge Publishers.
3. Shaw, J. & Goffinet, B. 2000. Bryophyte Biology, Cambridge University Press.
4. Rashid, A. 1998. An introduction to bryophyte. Vikas Publishing House, New Delhi.
5. Chopra, R.N. 1998. Topics in Bryology. Allied Printers, New Delhi.
6. Chopra, R.N. & Kumara, P. K. 1988. Biology of Bryophytes. Wiley East, New Delhi.
7. Prem Puri.1981. Bryophytes: Morphology, Growth and differentiation. Atma Ram and Sons, New Delhi.
8. Parihar, N.S. 1980. An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.
9. Smith, G. M. 1976. Cryptogamic Botany Vol. II. Tata McGraw Hill. Publishing Co. Ltd. New Delhi.
10. Cavers, F. 1976. The interrelationship of Bryophyta. S. R. Technic House, Asok Rajpath, Patna.
11. Watson, E.V. 1968. The structure and life of Bryophytes. Cambridge University, London.

B. PTERIDOPHYTA

1. General characters, classification (Bierhost, 1971) and life cycle of Pteridophytes;
3. Structure, reproduction and life cycle of the following types:
Ceratopteris, Lygodium, Trichomanes, Azolla.
4. Telome theory-basis, elementary proves- merits and demerits of telome theory; Evolutionary trends in the gametophytes of pteridophytes,
5. Conservation of Pteridophytes : Pteridophytes as ecological indicators
6. Principales of Paleobotany, Fossil pteridophytes:
Rhynia, Lepidocarpon,

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2. Sundara Rajan, S. 1999. Introduction to Pteridophyta. New Age Publications, New Delhi.
3. Rashid, A. 1999. Pteridophyta. Vikas Publishing House, New Delhi.
4. Sporne, K. R. 1986. Morphology of Pteridophytes. Hutchinson University Library, London.
5. Stewart, W. N. 1983. Paleobotany and Evolution of Plants. Cambridge University Press, London.
6. Eames, E. J. 1983. Morphology of Vascular Plants. Standard University Press.
7. Parihar, N. S. 1980. An Introduction to Embryophyta Vol. II. Pteridophyta. Central Book Depot, Allahabad.
8. Smith, G. M. 1976. Cryptogamic Botany Vol. II. Tata McGraw Hill, Publishing Co. Ltd. New Delhi.
9. Shukla, A. C. & Misra, S. P. 1975. Essentials of Paleobotany. Vikas Publishing House, New Delhi.
10. Bierhost, D.W. 1971. Morphology of vascular plants. Macmillan, London.
11. Scott, D. H. 1962. Studies in Fossil Botany. Hafner Publishing Co. New York.
12. Arnold, C. A. 1947. An Introduction to Paleobotany. McGraw Hill, New York.

C. GYMNOSPERMS

1. General characters, affinities, distribution of Gymnosperms
2. Classification of Gymnosperms (Sporne, 1965)
3. Phylogeny of Gymnosperms
4. Economic importance of Gymnosperms.
5. Structure, reproduction and life cycle of the following types:
Zamia, Araucaria, Cupressus, Ephedra

References

1. James W.B. 2015 The Gymnosperms Handbook: A practical guide to extant families and genera of the world. Plant Gateway Ltd.
2. Christenhurz M. J. M. Reveal, J. L. Farjon, A. Gardner, M. F. & Mill, R. R. M. and Chase M. W. (2011) A new classification and linear sequence of extant gymnosperms. Phytotaxa 19: 55-70. Magnolia Press
3. Vashishta, P.C. 2010. Gymnosperms, S. Chand & Company, New Delhi.
4. Chamberlain, C. J. 2000. Gymnosperms. CBS Publishers, New Delhi.
5. Biswas, C. & Johri, B. M. 1999. The Gymnosperms. Narosa Publishing House, New Delhi.
6. Bhatnagar, S. P. & Moitra, A. 1997. Gymnosperms. New Age Publications, New Delhi.
7. Sharma, O. P. 1997. Gymnosperms, Pragati Prakasan, Meerut.
8. Sporne, K. R. 1986. Morphology of Gymnosperms, Hutchinson University Library, London.
9. Ramanujan, C. G. K. 1976. Indian Gymnosperms in time and space. Today and Tomorrows printers and publishers, New Delhi.
10. Chamberlain, C. J. 1955. Gymnosperms-structure and evolution. Dover Publications, Inc. New York.
11. Coulter, J. M. & Chamberlain, C. J. 1964. Morphology of Gymnosperm. Central Book Depot, Allahabad.



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SEMESTER-I

Course Code: PLS 403 Course Name: Principles of Microbiology and Plant Pathology

Credits = 02

- To get a basic idea about the ecological significance of autotrophic and heterotrophic groups and microbes.
- To introduce the students about the aspects of Microbiology like classification, structure, metabolism, Bacterial culture and microbial diseases.
- To get the knowledge on various plant diseases caused by different types of pathogens its disease symptoms and control measures

MICROBIOLOGY

1. Brief histology of microbiology. Experiments of Pasterur, Koch's postulates.
2. Bacteria – Classification based on Bergey's Manual. Significance off 16 S RNA in Bacterial identification.
3. Major groups of microorganisms and their characteristics – prions, viroids, viruses, bacteria, archaeobacteria, mollicutes, actinomycetes, cyanobacteria, viable but nonculturable (VBNC) bacteria
4. Growth and nutrition of microorganisms. Growth characteristics.Continuous culture devices-Chemostat.
5. Extremophiles – Acidophilic, Alkalophilic, Thermophilic and halophilic bacteria. Stress responses in bacteria

References

1. Tortora, G.J., Funke, B.R. & Case, C.L. 2019. Microbiology an Introduction. 13th Edition. Pearson Education, Inc.
2. Talaro, K. P. & Chess, B. 2018. Foundations in microbiology. 10th Edition. Pearson Education, Inc.
3. Cowan, M.K. & Smith H. 2018. Microbiology: A Systems Approach. 5th Edition. Mc Graw Hill Edn.
4. Pommerville, J. C. 2017. Alcamo's Fundamentals of Microbiology, 11th Edition. Jones & Bartlett Learning.
5. Iwasa, J. & Marshall, W. 2017. KARP'S Cell and Molecular Biology. John Wiley & Sons, Inc.
6. Madigan M. T., Bender K.S., Buckley D.H., Sattley W.M., & Stahl D.A. 2017 Brock Biology of Microorganisms. Pearson Education, Inc.
7. Bauman, R. W. 2015. Microbiology: with diseases by body system 4th Edn. Pearson Education, Inc.
8. Sharma, P. D. 2010. Microbiology. Narosa publishers, New Delhi.
9. Dubey, R. C. & Maheswari, D.K. 2010. A Text book of Microbiology, S. Chand & Company, New Delhi.
10. Rangaswami G and Bagyaraj D.J. 2004. Agricultural Microbiology. Prentice-Hall of India Pvt. Ltd.
11. Atlas, M. & Bartha, R. 2000. Microbial Ecology, Longmann, New York.
12. Black, J. G. 1999. Microbiology – Principles and Explorations, Prentice Hall, London.
13. Casida, L. E. 1997. Industrial microbiology. New Age Publishers, New Delhi.
14. Pelczar, M. J., Chan, E. C. S. & Kreig, N. R. 1993. Microbiology-concepts and applications. McGraw Hill, Inc. New York.
15. Stainer, R.Y. *Stanier R.Y., Ingraham J.L., Wheelis M.L. and Painter P.R.* 1990. The microbial world. Prentice Hall of India, New Delhi.



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SEMESTER-I

D PLANT PATHOLOGY

1. General principles and concepts of host –parasite interaction.
2. Defence mechanisms – Systemic Acquired Resistance and Induced Systemic Resistance
3. Major signalling pathways of plant defense mechanism
4. Principles and methods of plant disease control : Fungicides and pesticides, natural pesticides, sanitation, disease resistance. Biological control: biocontrol agents, bio –inoculants, natural enemies, bio-traps
5. Study of the following plant diseases with reference to symptoms, causal organism, disease cycle and control measures.
 1. Ginger – Soft rot
 2. Tea – Red rust
 3. Ladies finger – Yellow vein mosaic
 4. Tomato – Bacterial wilt

References

- 1 Singh R.S. 2017. Introduction to Principles of Plant Pathology. 5th Edition. Medtech Publisher.
- 2 Mehrotra R.S. 2017. Plant Pathology. 3rd Edition. McGraw Hill Education
- 3 Dube H.C. 2014. Modern Plant Pathology.3rd Edition, Agribios, New Delhi.
- 4 Sharma, P. D, 2013. Plant Pathology. Rastogi Publishers New Delhi.
5. Agrios, G.N. 2005. Plant Pathology 5th Edition. Academic Press, New Delhi.
6. Sharma, P. D 2005. Plant pathology. Narosa Publishing House, New Delhi.
7. Rangaswamy, G. & Mahadevan, A. 2002. Diseases of crop plants in India. Prentice Hall, New Delhi.
8. Waller J.M., Lenne J. M. and Waller S.J, 2002, Plant Pathologist's Pocket book,3rd edition ,CABI ,UK
9. Singh, R. S. 2000. Introduction to the principles of plant pathology. Oxford IBH, New Delhi.
10. Marshall, H. 1999. Diseases of plants. Anmol Publications Pvt. Ltd., New Delhi.
11. Swarup 1999. Plant diseases. Anmol Publications Pvt. Ltd. New Delhi.
12. Bilgrami, K. S. & H. C. Dube.1990. A Text Book of modern plant pathology. Vikas Publishers, New Delhi.
13. Butler, E. J. & Jones, S. G. 1949. Plant pathology. Macmillan & Co. Ltd. London.
14. Chatterjee, P. B. 1997. Plant protection techniques. Bharati Bhavan, Patna.
15. Chattopadhyay, S. B. 1991. Principles and procedures of plant protection Oxford & IBH, New Delhi.
16. Manners, J.G.1982. Principles of Plant pathology. Cambridge University Press, London.
17. Mundkur, B. B.1982. Text book of Plant diseases. Macmillan India Ltd., New Delhi.
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SEMESTER-I

Course Code: PLS 401 (L)
Mycology- Lab

Course Name: Fundamentals of Phycology and
Credits = 02

1. A record of algal types mentioned above – A study of their morphology and structures including vegetative and reproductive stage of lifecycle.
2. Study of anatomical structure wherever relevance
3. Field trips to be conducted for students to get familiarized with the local flora

Course Code: PLS 402 (L) Course Name: Studies on Bryophytes, Pteridophytes and
Gymnosperms –Lab Credits = 02

1. Structural details of the vegetative and reproductive parts of the types mentioned in the syllabus.
2. Identification of fossil types mentioned in the syllabus

Course Code: PLS 403 (L)
Plant Pathology- Lab

Course Name: Principles of Microbiology and
Credits = 02

1. Differential staining – Gram staining of pure culture of Lactobacillus/Rhizobium
2. Isolation of Rhizobium from root nodule of legumes.
3. A record of all diseases mentioned in the syllabus



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SEMESTER-I

Course Code PLS 404 Course Name: Organic and Natural Farming
Credits = 02

Course Objectives:

- Give the students exposure to the experiences of management and functioning organic farms
- Help the students to learn a means of self-employment and income generation

Course outcome: By successfully completing the course, students will be able to:

- knowledge and proficiency in Organic Farming Practices,(both Basic and Social Aspects) marketing of organically raised agricultural produces
- Gain the theoretical knowledge of cultivation of different types of edible mushrooms and spawn production
- Learn a means of self-employment and income generation

UNIT I

Organic Farming: Concepts and principles of organic farming; Historical development of Organic Agriculture in India; Why Organic Farming? ; Detrimental effects of currently chemical dependent farming; Reduction of crop production due to depletion of soil Health; Pesticide contamination and human health hazard; Contamination of food products by pesticides & chemicals; Environmental (soil, water, air) pollution. v) Reduction of natural enemies of crop pests; Threat to Bio diversity.

UNIT II

Types of Farming (Advantage & disadvantage of each system)

Pure Organic Farming – Definition, Concept & Benefits; Integrated Farming system (Combination of Organic and Inorganic); Mixed Farming.

UNIT III

Various Organic Farming Models-Natural Farming, Fukuoka-Japan, Parma Culture, Billmollyson, Australian Organic Farming, Ecological Farming, Palekar Model; From Punam Farming to Green Revolution; Combined Farming-Paddy, Coconut Tree, Fish, Duck etc.

UNIT IV

Harvest and Post-harvest Management under Organic Farming; Integrated Pest and Disease Management under Organic Farming; Weed control , Soil Nutrient Management and irrigation management under Organic Farming.

UNIT V

Undertake Quality Assurance & Certification in Organic Farming; understand different types of certification available for organic produce; Third party certification & Participatory guarantee systems; procedures and timelines for applying for certification; quality checks (one-time and recurring) for obtaining and maintaining certification; study the organic standards in detail for every aspect of farming, including storage, transport and sale; Organic Farming Products-Marketing, Theory and Practical Aspects.

References

- 1 Sarath Chandran, Unni M.R and Sabu Thomas. 2018. Organic farming. Woodhead Publishing, UK.
- 2 Reddy, S.R.2017. Principles of organic farming. Kalyani publishers, India
- 3.Ranjan Kumar Biswas. 2014. Organic farming in India. New Delhi Publishers, India.
- 4.Peter Fossel. 2014. Organic Farming: How to Raise, Certify, and Market Organic Crops and Livestock. Reprint edition, Voyageur Press, USA.



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SEMESTER-I

Course Code: PLS 405

Course Name: Histology and Micro Techniques

Credits = 02

Objectives

- To understand the various tissue systems, anatomical features of plant parts and to identify the anomalous growth
- To correlate familiarize the various stains and staining techniques
- To familiarize the techniques for the preservation and processing of tissues
- To get practical experience in microtechnique and histochemistry
- To make the students aware of defining a research problem and the various steps of successful execution of a research problem and its documentation and communication

A. HISTOLOGY

1. Origin, structure and function of cambium and their derivatives and various types of tissues
2. Anomalous cambial activities in Bignonia, Amaranthus, Mirabilis,
3. Nodal anatomy, root – stem transition, transfer cells.
4. Floral anatomy
5. Anatomy in relation to taxonomy

References

1. Cutler D.F., Ted Botha T. and Stevenson D.W. 2016. Plant Anatomy: An Applied Approach. John Wiley & Sons.
2. Clive K. 2016. Plant Anatomy, Morphology and Physiology. Syrawood Publishing House
3. Esau, K. 2006. The Anatomy of Seed Plants. 2nd Edition. John Wiley & Sons, New York.
4. Fahn, A. 1989. Plant Anatomy, Pergamon Press, Oxford, New York.
5. Eames, A. J. & Mac Daniels, L. H. 1979. An Introduction to Plant Anatomy. McGraw Hill New York.
6. Cutler, E. G. 1978. Plant Anatomy (Vol. I, II.) Edward Arnold, London.
7. Chandurkar, P. J. 1966. Plant Anatomy. Oxford & IBH Publication Co. New Delhi.
8. Foster, A. S. 1960. Practical Plant Anatomy. Van Nostrand & East West, New Delhi.
9. Metcalfe, C.R. & Chalk, L. 1950. Anatomy of the Dicotyledons and Monocots (Vol. I, II), Oxford University Press, London.

B. Microtechnique

1. Scope of histochemistry and cytochemistry in Biology
2. Chemical fixation – reagents and fixatives, chemistry of fixation; Tissue dehydration – reagents, Infiltration and embedding; Sectioning and mounting
3. squashes, smears and maceration
4. Microtomy – Cryostat and Ultratomes
5. Classification and chemistry of biological stains. General and specific vital stains and fluorochromes.
6. Micrometry, camera lucida,
7. Tissue processing techniques for electron microscopy
8. Detection and localization of primary metabolites – Carbohydrates (PARS reaction), Proteins (Coomassie brilliant blue staining), Lipids (Sudan Black method)/ Brief mention about and other methods
9. Detection and localization of secondary metabolites – alkaloids, terpenoids, phenolics
10. Enzyme histochemistry – General design and applications.



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2. Prasad M. K. & Prasad M. K. 2000. Emkay Publications
3. Kierman, J.A.1999. Histological and Histochemical Methods. Butterworth Publ. London.
4. Ruzin, Z. E. 1999. Plant Microtechnique and Microscopy. Oxford Press, New York.
5. Harris, J. R. 1991. Electron Microscopy in Biology. Oxford University Press, New York.
6. Gahan, P.B. 1984. Plant Histochemistry and Cytochemistry. Academic Press, London.
7. Johanson, W. A.1984. Plant Microtechnique. McGraw Hill, New York.
8. Johanson, W. A. 1982. Botanical Histochemistry-Principles and Practice. Freeman Co.
9. John E. Sass. 1964. Botanical Microtechnique. Oxford & IBH Publishing Co. Calcutta.



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अस्थाई शैक्षणिक खण्ड, शाहपुर, जिला काँगड़ा, हिमाचल प्रदेश - 176206

Temporary Academic Block, Shahpur, Distt. Kangra (HP) - 176206

Website: www.cuhimachal.ac.in

SEMESTER-I

Course Name: PLS 406 Course Name: Protected Cultivation of High Value Crops
Credits = 02

Objective

To impart latest knowledge in growing of high value crops under protected environmental condition.

Course outcome

Students gain theoretical knowledge on protected cultivation and its implications

UNIT I

Importance and scope of protected cultivation of vegetable crops; principles used in protected cultivation, energy management, low cost structures; training methods; engineering aspects.

UNIT II

Protected Cultivation – Greenhouse –Polyhouses- Plastic Tunnel – Shadenet House – Walk in Tunnels – Plant Protection Nets – Surface Cover Cultivation – Plastic Mulching – Soil Solarisation, Manipulation of CO₂, light and temperature for vegetable production, fertigation.

UNIT III

Water Resource Management in protected cultivation – Farm Pond & Reservoir lined with Plastic Films

UNIT IV

Problem of growing vegetables in protected structures and their remedies, insect and disease management in protected structures; soil-less culture, use of protected structures for seed production.

UNIT V

Crops covered under Greenhouse- Cabbage, Cucumber, Tomato, Capsicum; Crops under shadenet house - Ridge gourd, Bottle gourd, Cucumber, Capsicum, Broccoli, Okra, Chilli Vermi Bed – Organic Farming BIS Standards - Protected Cultivation; MIDH – Path Forward

References

1. Anonymous 2003. Proc. All India Seminar on Potential and Prospects for Protective Cultivation. Organised by Institute of Engineers, Ahmednagar. Dec.12-13, 2003.
2. Chandra S & Som V. 2000. Cultivating Vegetables in Green House. Indian Horticulture 45: 17-18.
3. Prasad S & Kumar U. 2005. Greenhouse Management for Horticultural Crops. 2nd Ed. Agrobios.
4. Tiwari GN. 2003. Green House Technology for Controlled Environment. Narosa Publ. House.



हिमाचल प्रदेश केंद्रीय विश्वविद्यालय

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SEMESTER-I

Course Name: PLS 407
Credits = 02

Course Name: Commercial Horticultural Crops

UNIT I

National and International scenario in fruit production and floriculture, Recent advances in propagation – root stock influence, planting systems, High density planting, crop modeling, Precision farming, decision support systems - aspects of crop regulation- physical and chemical regulation effects on physiology and development, influence of stress factors, strategies to overcome stress effects, integrated and modern approaches in water and nutrient management. Total quality management (TQM) - Current topics.

UNIT II

Fruit Crops ; Mango, Papaya, Citrus, Guava, Apple, Plums, Peach

UNIT III

Specific objectives of breeding in flower crops, Methods of breeding suited to seed and vegetatively propagated flower crops, Introduction, selection, polyploidy and mutation breeding in the evolution of new varieties, Exploitation of heterosis, utilization of male sterility incompatibility problems, In Vtro breeding.

UNIT IV

Floral oil industry, floral concrete production, extraction methods, recent advances.

Flower forcing and year-round flowering through physiological interventions; Chemical regulation; Environmental manipulation; Harvest indices; Harvesting techniques; Post-harvest handling; Precooling, pulsing, packing, marketing; Export potential; Agri Export Zones.

UNIT V

Crop specific practices – rose, anthurium, orchids, carnation, Jasminum sp., marigold, tuberose, crossandra

References

- Bose TK, Maiti RG, Dhua RS & Das P. 1999. Floriculture and Landscaping. Naya Prokash.
Chadha KL & Choudhury B. 1992. Ornamental Horticulture in India. ICAR.
George S & Peter KV. 2008. Plants in a Garden. New India Publ. Agency.
Lauria A & Victor HR. 2001. Floriculture – Fundamentals and Practices. Agrobios.
Randhawa GS & Mukhopadhyay A. 1986. Floriculture in India. Allied Publ.
Reddy S, Janakiram B, Balaji T, Kulkarni. S & Misra RL. 2007. Hightech Floriculture. Indian Society of Ornamental Horticulture, New Delhi.



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SEMESTER-I

Course Name: PLS 408

Course Name Mushroom Production

Credits = 02

Course Objectives:

- Enable the students to identify edible and poisonous mushrooms
- Give the students exposure to the experiences of experts and functioning mushroom farms
- Help the students to learn a means of self employment and income generation

Course outcome: By successfully completing the course, students will be able to:

- Identify edible types of mushroom
- Gain the theoretical knowledge of cultivation of different types of edible mushrooms and spawn production
- Manage the diseases and pests of mushrooms
- Learn a means of self-employment and income generation

UNIT I

Introduction, history and Scope of mushroom cultivation; Systematic details and biology of mushrooms; Nutritional value and medicinal value of mushrooms; Poisonous and edible mushrooms; Examples for poisonous and edible mushrooms; common edible mushrooms in India.

UNIT II

Structure and construction of mushroom house. equipments and substrates in mushroom cultivation; Spawn: types of spawn, preparation of spawn; Composting technology, mushroom bed preparation; harvesting. Casing; raw material used for casing, preparation of casing material; important sanitation during various stages of mushroom cultivation

UNIT III

Cultivation of important mushrooms: General process for the cultivation of *Agaricus bisporus*, *Pleurotus ostreatus* and *Volvariella volvacea*

UNIT IV

Problems in cultivation - diseases, pests and nematodes, weed moulds and their management strategies.

UNIT V

Post-harvest technology; Preservation of mushrooms – Long term and short term storage of mushrooms - freezing, dry freezing, drying, canning, quality assurance and entrepreneurship. Value added products of mushrooms; Marketing of mushrooms in India and world.

Reference

1. Marimuthu, T. et al. (1991). Oster Mushroom. Department of Plant Pathology. Tamil Nadu Agricultural University, Coimbatore.
2. Nita Bhal. (2000). Handbook on Mushrooms. 2nd ed. Vol. I and II. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi
3. Pandey R.K, S. K Ghosh, 1996. A Hand Book on Mushroom Cultivation. Emkey Publications.
4. Pathak, V. N. and Yadav, N. (1998). Mushroom Production and Processing Technology. Agrobios, Jodhpur.
5. Tewari Pankaj Kapoor, S. C. (1988). Mushroom Cultivation. Mittal Publication, New Delhi.
6. Tripathi, D.P. (2005) Mushroom Cultivation, Oxford & IBH Publishing Co. PVT.LTD, New Delhi.
7. V.N. Pathak, Nagendra Yadav and Maneesha Gaur, Mushroom Production and Processing Technology/ Vedams Ebooks Pvt Ltd., New Delhi (2000).