

CURRICULUM PLANNING AND IMPLEMENTATION

Paper: BT-2: Botany-B

Class: B.Sc (BIO-TECHNOLOGY)

Sem: II

Name of the Teacher: Ms. Devika Gandhi

Availability timings: 9:00 AM to 4:30 PM

Email: devikabotanylkc@gmail.com

Objectives of the course:

This course aims to identify all the kinds of plants on earth with their names, distribution, habit, characteristics and affinities. It also aims to arrange the kinds of plants into a scheme of classification or an orderly arrangement.

Course content:

The course provides an introduction to taxonomy and classification and arrangement of taxa on the basis of their relationships i.e. phylogenetic relationship. Type of classification is further of three types: Artificial, Natural, Phylogenetic classification. It also provides the information of evolution of angiosperms their different families and studies of some families their characteristics. It also aims to provide knowledge of seed biology, methods of seed production and seed testing whether they are viable seeds or non-viable seeds.

Detailed course contents: available at www.gndu.ac.in

Teaching methods:

- Three lectures per week
- Student seminars
- Assignments to students
- Powerpoint presentations
- Topic based tests

Program learning outcomes:

Knowledge and understanding:

Students will

- Know the significant difference between old and modern systems of classification.
- Learn about various kinds of plants on the earth.
- Understand the evolutionary status of families of angiosperms.
- Describe the characters of some plants.
- Know the difference between seed and grain.
- Student will understand the seed biology.

Intellectual skills:

Students will

- Compare between past and modern classification systems.
- Compare the characteristics of families of angiosperms

Practical skills:

Students will

- Use the simple microscope to identify different botanical samples.
- Demonstrate the main features of many flowers

Transferable skills:

Students will

- Aware people about the economic importance of plants.

Modes of assessment	Minimum score required (to qualify for the next exam/ class)	Schedule
Continues internal evaluation (CIE)	40%	
1. Class tests (unit wise)		After each unit
2. Student seminar		Every week
3. In house exams	35%	Third week of March
End of semester exam	35%	Last week of April/ First week of May

Teaching outline:

Unit	Teaching dates
I	11 January to 29 January
II	03 February to 26 February
III	02 March to 01 April
IV	06 April to 22 April
Revision	Till 30 April

Attendance policy:

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing when they will be detained from appearing in university exams.

Text books:

1. Vashistha, P. C. (2016). Botany for degree students. S. Chand and Company, New Delhi.
2. Sen, S. and Ghosh, N. Seed Science and Technology. Kalyani Publishers, Ludhiana

References:

1. Davis, P.H. and Heywood, V.H. (1963). Principles of Angiosperm Taxonomy, Oliver and Boyd, London.
2. Gifford, E.M. and Foster, A.S. (1988). Morphology and Evolution of Vascular Plants, W.H. Freeman & Company, New York.
3. Jeffrey, C. (1982). An Introduction to Plant Taxonomy, Cambridge University Press, Cambridge, London.
4. Jones, S.B., Jr. and Luchsinger, A.E. (1986). Plant Systematics (2nd edition). McGraw-Hill Book Co., New York.
5. Radford, A.E. (1986). Fundamental of Plant Systematics, Harper and Row, New York
6. McDonald, M. F. and Copeland, L. O. (2012). Seed Production: Principles and Practices, Springer, New York.
7. Basra, A. (Ed). (2006). Handbook of Seed Science and Technology. CRC Press, New York.
8. Barney, N., Waraich, M.K., Kumar, R., Goel, S.C. And Sharma, A. D. A Text Book of Biotechnology: Life Sciences – II. Lakhanpal Publishers, Amritsar

E-resources:

<https://www.pdfdrive.com/an-introduction-to-plant-taxonomy-e33415220.html>

<https://www.pdfdrive.com/botany-illustrated-introduction-to-plants-major-groups-flowering-plant-families-e176709562.html>

<https://www.pdfdrive.com/principles-of-seed-science-and-technology-e162762202.html>

<https://www.pdfdrive.com/seed-science-and-technology-e59216141.html>

CURRICULUM PLANNING AND IMPLEMENTATION

Paper –BT-2: Botany – C

Class: B.Sc (Biotech)

Sem: IV

Name of the Teacher: Ms. Devika Gandhi

Availability timings: 9:00 AM to 4:30 PM

Email: devikabotanylkc@gmail.com

Objectives of the course:

This course deals with the plant physiology that includes the study of all the internal activities of plants—those chemical and physical processes associated with life as they occur in plants. At the smallest scale are molecular interactions of photosynthesis and internal diffusion of water, minerals, and nutrients and plant's adaptations towards stressful conditions. Another aspect of this course includes plant pathology which describes various plant diseases, their causal organisms, mode of transmission, symptoms and control.

Course content:

The course defines plant- water relations, physiological and molecular adaptations of plants under different stressed conditions. The role of heat shock proteins dehydrins, late embryogenesis abundant proteins, osmolytes in stress tolerance have been included. This course also includes plant pathology, epidemiology, classification, mode of transmission, control measures of different plant diseases, disease resistance and host- pathogen interactions. However, a detailed account of the few plant diseases with respect to their casual agents, symptoms, epidemiology, disease cycle & their control measures are also involved. Description of few plant diseases included in this course are black stem rust of wheat, loose smut of wheat, late and early blight of potato, false smut of rice, bacterial blight of rice, red rot of sugarcane, TMV of potato, yellow vein mosaic of bhindi, bunchy top of banana, downy mildew of bajra.

Detailed course contents: available at www.gndu.ac.in

Teaching methods:

- Three lectures per week
- Student seminars
- Assignments to students
- Power point presentations
- Topic based tests
- Group discussions

Program learning outcomes:

Knowledge and understanding:

Students will

- Come to know about the plant metabolism and their adaptation.
- Learn about different plant diseases in detail.
- Practical demonstrations of different plant pathogens and estimation of plant-water relationship (measure of water potential, relative water content etc.).

Intellectual skills:

Students will

- Analyse the physiological aspects of plants.
- Access the new facts and concepts of learning.

Practical skills:

Students will

- Able to evaluate healthy and infected plants.
- Able to understand the logic behind plant's physiological behaviour.

Transferable skills:

Students will

- Demonstration of independence and originality in solving problems.
- The ability to exercise initiative and personal responsibility.
- The development of independent learning skills required for continuing professional development.

Modes of assessment	Minimum score required (to qualify for the next exam/ class)	Schedule
Continues internal evaluation (CIE)		
4. Class tests (unit wise)	40%	After each unit
5. Student seminar		Every week
6. In house exams	35%	Third week of March
End of semester exam	35%	Last week of April/ First week of May

Teaching outline:

Unit	Teaching dates
I	11 January to 12 February
II	17 February to 26 February
III	02 March to 25 March
IV	30 March to 22 April
Revision	Till 30 April

Attendance policy:

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing when they will be detained from appearing in university exams.

Text books:

1. Pandey, B.P. (2001) Plant Pathology, S Chand & Company
2. Srivastava, H.N. (2005) Plant Physiology, Pardeep Publications

References:

1. Salisbury, F.B. and C.W. Ross (1992), Plant Physiology, Wadsworth Publication Company
2. Taiz, L. and Zeiger, E. (2002), Plant Physiology. 3rd Edn., Sinauer Associates
3. M.J. Carlile, S.C. Watkinson & G.W. Gooday (2001), The Fungi 2nd Ed., Academic Press.
4. G.N. Agrios (1997), Plant Pathology 4th Ed., Academic Press.
5. R.S. Mehrotra (1980) Plant Pathology Tata McGraw Hill New Delhi.
6. Barney, N., Singh, J., Arora, A., Sharma, D., Duggal, N. K. And Sharma, C. S. A Text Book of Biotechnology: Life Sciences – III. Lakhnawal Publishers, Amritsar

E-resources:

<https://www.slideshare.net/JAYAKRISHNANK9/plant-diseases-70573937>

<https://www.slideshare.net/sampathkumarbanoth5/1018-17174869>

<https://www.slideshare.net/VBCOPS/glycolysis-ppt>

<https://www.pdfdrive.com/introduction-to-plant-physiology-4th-edition-e43384728.html>

CURRICULUM PLANNING AND IMPLEMENTATION

Paper Name: II – A (Cytology)

Class: B.Sc (Medical)

Sem: II

Name of the Teacher: Dr. Heminder Singh

Availability timings: 9:00 AM to 4:30 PM

Email: rednimeh75@gmail.com

Objectives of the course:

This course aims to provide knowledge about cell structure and to emphasize the important role that ploidy, chromosome number, structure, mutations plays in our life. The student will be able to identify the karyotypes, chromosomes, cell cycle and cell divisions, electron micrographs of cell organelles.

Course content:

The course provides an introduction to cytology. Among the topics are: Structure and functions of cell organelles, chromosome structure, chromosomal number variations and associated abnormalities.

Detailed course contents: available at www.gndu.ac.in

Teaching methods:

- Four lectures per week
- Student seminars
- Assignments to students
- Power-point presentations
- Topic based tests

Program learning outcomes:

Knowledge and understanding:

Students will

- Understand the cell ultrastructure.
- Know structure and function of cell organelles.
- Structure of chromosome and effects of structural and number variations.

Intellectual skills:

Students will

- Grasp over detailed structure of unit of life (cell).
- Implications of variations in chromosome structure or number on organism.

Practical skills:

Students will

- Use the simple microscope to identify different stages of cell divisions i.e., mitosis and meiosis
- Demonstrate the main features of linkage.
- Observe chromosomes under microscope and their movement and arrangement at different stages of cell division.
- Identification of cell organelles by micrographs.
- Observation of some organelles like chloroplasts.
- Be familiar with some methods to construct karyotype.

Transferable skills:

Students will

- Exchange ideas, principles and information by oral, written and visual means.
- Use the information technology to gather information and write reports

Modes of assessment	Minimum score required (to qualify for the next exam/ class)	Schedule
Continues internal evaluation (CIE)		
7. Class tests (unit wise)	-	After each unit
8. Student seminar	-	Every week
9. In house exams	35%	Third week of March
End of semester exam	35%	April-May, 2020

Teaching outline:

Unit	Teaching dates
A	Jan 11 - Jan 30
B	Feb 03 - Feb 22
C	Feb 25 - March 12
D	March 16 - April 08
Revision	April 09 till start of university exams

Attendance policy:

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing when they will be detained from appearing in university exams.

Text books:

1. Arora, B.B. Cell Biology and Genetics. Modern Publishers
2. Srivastava, H.N. Cell Biology and Genetics. Pradeep Publishers

References:

1. Fletcher, H., Hickey, I. and Winter, P. (2010). Instant Notes on Genetics (3rd edition) Taylor and Francis Group, USA.
2. Gardner, E.J., Simmons, M.J. and Snustad, D.P. (2012). Principles of Genetics (8th Edition).
3. Brown, T.A. (2011). Genetics: A Molecular Approach (3rd Edition). BIOS Scientific Publishers, UK.
4. Gupta, P.K. (2016). Cell and Molecular Biology, Rastogi Publications, Meerut, India.
5. Kleinsmith, L.J. and Kish, V.M. (1995). Principles of Cell and Molecular Biology (2nd Edition). Harper Collins College Publishers, New York, USA.
6. Krebs, B. E., Goldstein, E.S. and Kilpatrick, S.T. (2011). Lewins Genes X. Jones and Bartlett Publishers, LLC, UK.
7. Lodish, H., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A. and ploegh, H. (2016). Molecular Cell Biology, W.H. Freeman & Co., New York, USA.
8. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics (5th Edition). John Wiley and Sons Inc., U.S.A.
9. Singh, B.D. (2007). Molecular Genetics. Kalyani Publishers, India.

E-resources:

<http://www.omicsonline.org>conference-list>plant-cytology>

plantphy.info>plant_physiology>basiccytology

plantphy.info>plant_physiology>cytology

<http://simple.wikipedia.org>wiki>cytology>

CURRICULUM PLANNING AND IMPLEMENTATION

Paper Name: II – B (Genetics)

Class: B.Sc (Medical)

Sem: II

Name of the Teacher: Dr. Heminder Singh

Availability timings: 9:00 AM to 4:30 PM

Email: rednimeh75@gmail.com

Objectives of the course:

This course aims to provide knowledge about current genetics and to emphasize the important role that genetics plays in our life. The student will be able to understand the chromosome and DNA structure, cell cycle and cell divisions, mutations methods and implications.

Course content:

The course provides an introduction to genetics. Among the topics are: DNA the genetic material, Cell cycle, Mendelian genetics, chemical basis of genetics, genetic variations and mutations.

Detailed course contents: available at www.gndu.ac.in

Teaching methods:

- Four lectures per week
- Student seminars
- Assignments to students
- Power-point presentations
- Topic based tests

Program learning outcomes:

Knowledge and understanding:

Students will

- Understand the concept and methods of the Mendelian genetics.
- Know the mechanism of transmission of traits from one generation to another.
- Understand the principles of dominance, segregation and independent assortment.
- Understand gene structure and function, and control of gene action.

Intellectual skills:

Students will

- Predict the outcomes of genetic crosses.
- Explain why the genetic code is read by three letters, not by two or one letter.

- List and describe the principal forms of mutation.

Practical skills:

Students will

- Use the simple microscope to identify different stages of cell divisions i.e., mitosis and meiosis
- Demonstrate the main features of linkage.
- Be familiar with some methods to construct karyotype.

Transferable skills:

Students will

- Exchange ideas, principles and information by oral, written and visual means.
- Use the information technology to gather information and write reports

Modes of assessment	Minimum score required (to qualify for the next exam/ class)	Schedule
Continues internal evaluation (CIE)	-	
10. Class tests (unit wise)	-	After each unit
11. Student seminar	-	Every week
12. In house exams	35%	Third week of March
End of semester exam	35%	April-May, 2020

Teaching outline:

Unit	Teaching dates
A	Jan 11 - Jan 30
B	Feb 03 - Feb 22
C	Feb 25 - March 12
D	March 16 - April 08
Revision	April 09 till start of university exams

Attendance policy:

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing when they will be detained from appearing in university exams.

Text books:

- Arora, B.B. Cell Biology and Genetics. Modern Publishers
- Srivastava, H.N. Cell Biology and Genetics. Pradeep Publishers

References:

10. Fletcher, H., Hickey, I. and Winter, P. (2010). Instant Notes on Genetics (3rd edition) Taylor and Francis Group, USA.
11. Gardner, E.J., Simmons, M.J. and Snustad, D.P. (2012). Principles of Genetics (8th Edition).
12. Brown, T.A. (2011). Genetics: A Molecular Approach (3rd Edition). BIOS Scientific Publishers, UK.
13. Gupta, P.K. (2016). Cell and Molecular Biology, Rastogi Publications, Meerut, India.
14. Kleinsmith, L.J. and Kish, V.M. (1995). Principles of Cell and Molecular Biology (2nd Edition). Harper Collins College Publishers, New York, USA.
15. Krebs, B. E., Goldstein, E.S. and Kilpatrick, S.T. (2011). Lewins Genes X. Jones and Bartlett Publishers, LLC, UK.
16. Lodish, H., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A. and ploegh, H. (2016). Molecular Cell Biology, W.H. Freeman & Co., New York, USA.
17. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics (5th Edition). John Wiley and Sons Inc., U.S.A.
18. Singh, B.D. (2007). Molecular Genetics. Kalyani Publishers, India.

E-resources:

[http://en.wikipedia.org>wiki>plant_genetics](http://en.wikipedia.org/wiki/plant_genetics)

[http://www.nature.com>subjects](http://www.nature.com/subjects)

[http://www.sciencedirect.com>topics>agricultural-and-biological-sciences](http://www.sciencedirect.com/topics/agricultural-and-biological-sciences)

[www.frontiersin.org>Plant_Genetics_and_Genomics](http://www.frontiersin.org/Plant_Genetics_and_Genomics)

CURRICULUM PLANNING AND IMPLEMENTATION

Paper –IV A: Diversity of Seed Plants and Their Systematics - I

Class: B.Sc (MEDICAL)

Semester: IV

Name of the Teacher: Dr. Upma Arora

Availability timings: 9:00 AM to 4:30 PM

Email: upmabotanylkc@gmail.com

Objectives of the course:

This course aims to understand the concept of spermatophytes, the main characters of seed plants, their origin and evolution. This course provides the information of palaeobotany. It also provides the information regarding gymnosperms and their representative members.

Course content:

The course provides an introduction to gymnosperms their morphology of vegetative and reproductive parts; anatomy of root, stem and leaf. Reproduction and life cycle of representative members. Distinguish features of gymnosperms and angiosperms. Introduction to palaeobotany and geological time scale.

Detailed course contents: available at www.gndu.ac.in

Teaching methods:

- Four lectures per week
- Student seminars
- Assignments to students
- PowerPoint presentations
- Topic based tests

Program learning outcomes:

Knowledge and understanding:

Students will

- Describe the characteristics of seed plants
- Describe the structure of gymnosperms
- List the basic concepts of gymnosperms
- Write significant difference between angiosperms and gymnosperms

Intellectual skills:

Students will

- Evaluate the gymnosperms evolution.
- Explain the evolution of the seed habit
- Study the living and fossil gymnosperms

Practical skills:

Students will

- Demonstrate the main features of seed plants
- Use the simple microscope to identify different anatomical parts of gymnosperms
- Demonstrate the main features of gymnosperms

Transferable skills:

Students will

- Exchange ideas, principles and information by oral, written and visual means.
- Use the information technology to gather information and right reports.
- Aware people about the economic importance of plants.

Modes of assessment	Minimum score required (to qualify for the next exam/ class)	Schedule
Continues internal evaluation (CIE)		
13. Class tests (unit wise)	40%	After each unit
14. Student seminar		Every week
15. In House exams	35%	Third week of March
End of semester exam	35%	Last week of April/ First week of May

Teaching outline:

Unit	Teaching dates
I	11 January to 30 January
II	3 February to 21 February
III	26 February to 17 March
IV	23 March to 11 April
Revision	Till April 30 th

Attendance policy:

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing when they will be detained from appearing in university exams.

Text books:

Vashistha, P. C. (2016). Botany for Degree Students. S. Chand and Company, New Delhi.

References:

1. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms, New Age International Limited, New Delhi.

2. Gifford, E.M. and Foster, A.S. (1988). Morphology and Evolution of Vascular Plants, W.H. Freeman & Company, New York.
3. Pellant, C. (1994). Fossils, Dragon's World, Great Britain
4. Sporne, K.R. (1965). The Morphology of Gymnosperms, Hutchinson & Co. (Publishers) Ltd., London.
5. Taylor, T. N., Taylor, E. L. and Krings, M. (2008). Paleobotany: The Biology and Evolution of Fossil Plants (2nd Edition). Elsevier Inc. Netherlands.

E-resources:

<https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/gymnosperm>

<http://www-plb.ucdavis.edu/courses/bis/1c/text/Chapter24nf.pdf>

<https://www.digitalatlasofancientlife.org/learn/geological-time/geological-time-scale/>

<https://biologyboom.com/seed-habit/>

[https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_\(Boundless\)/26%3A_Seed_Plants/26.1%3A_Evolution_of_Seed_Plants/26.1C%3A__Evolution_of_Angiosperms](https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(Boundless)/26%3A_Seed_Plants/26.1%3A_Evolution_of_Seed_Plants/26.1C%3A__Evolution_of_Angiosperms)

CURRICULUM PLANNING AND IMPLEMENTATION

Paper Name: IV – B (Diversity of Seed Plants and their Systematics II)

Class: B.Sc (Medical)

Sem: IV

Name of the Teacher: Dr. Heminder Singh

Availability timings: 9:00 AM to 4:30 PM

Email: rednimeh75@gmail.com

Objectives of the course:

This course aims to provide knowledge about principles of plant taxonomy and classification systems such as Bentham and Hooker, Engler and Prantl. The student will get familiar with diagnostic features and importance of common plant families and identify common plants of daily usage.

Course content:

The course provides an introduction to principles of plant taxonomy, study of traditional plant classification systems, study of diagnostic features of important families and identification and study of available plants.

Detailed course contents: available at www.gndu.ac.in

Teaching methods:

- Four lectures per week
- Student seminars
- Assignments to students
- Power-point presentations
- Topic based tests

Program learning outcomes:

Knowledge and understanding:

Students will

- Understand the concepts and principles of plant taxonomy.
- Knowledge of classification systems.
- Study of important plant families and examples
- Knowledge of floral terminology.

Intellectual skills:

Students will

- Understand principles of plant taxonomy
- Identify important plants and their families by knowledge of diagnostic features.

Practical skills:

Students will

- Skill to study structure of any flower and with help of diagnostic features identification the family.
- Study of plants with help of herbarium.

Transferable skills:

Students will

- Exchange ideas, principles and information by oral, written and visual means.
- Use the information technology to gather information, study plants and write reports.

Modes of assessment	Minimum score required (to qualify for the next exam/ class)	Schedule
Continues internal evaluation (CIE)	-	
16. Class tests (unit wise)		After each unit
17. Student seminar	-	Every week
18. In house exams	35%	Third week of March
End of semester exam	35%	April-May, 2020

Teaching outline:

Unit	Teaching dates
A	Jan 11 - Jan 30
B	Feb 03 - Feb 22
C	Feb 25 - March 12
D	March 16 - April 08
Revision	April 09 till start of university exams

Attendance policy:

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing when they will be detained from appearing in university exams.

Text books:

1. Dhand, N. Systematics of Spermatophyta. Trueman Publishers
2. Srivastava, H. N. Diversity of Seed Plants and their Systematics. Pradeep Publishers

References:

1. Davis, P. H. and Heywood, V. H. (1963). Principles of Angiosperm Taxonomy, Oliver and Boyd, London.

2. Bendre, A (2007). Practical Botany, Rastogi Publications, Meerut.
3. Giggord, E.M. and Foster, A.S. (1998). Morphology and Evolution of Vascular Plants, WH Freeman & Company, New York.
4. Jones, S. B. Jr and Luchsinger, A.E. (1986). Plant Systematics (2nd edition). McGraw-Hill Book Co., New York.

E-resources:

[www. biologydiscussion.com>plant-taxonomy](http://www.biologydiscussion.com/plant-taxonomy)

[http://en.wikipedia.org>wiki>plant_taxonomy](http://en.wikipedia.org/wiki/plant_taxonomy)

[http://www.encyclopedia.com>botany>botany-general>plant-taxonomy](http://www.encyclopedia.com/botany/botany-general/plant-taxonomy)

CURRICULUM PLANNING AND IMPLEMENTATION

Paper: VI – A (ECOLOGY)

Class: B.Sc (MEDICAL)

Semester: VI

Name of the Teacher: Dr. Upma Arora

Availability timings: 9:00 AM to 4:30 PM

Email: upmabotanylkc@gmail.com

Objectives of the course:

This course aims to understand the concept of plant ecology, population ecology, vegetation, structure and synthetic characteristics of vegetation structure communities. It provide the information of the effects of climatic factors on plant life, Also the environmental factors of biotic and biotic components will be provided a general knowledge.

Course content:

The course provides an introduction to plant ecology, comparing the effects of climatic factors on plant life. It provides information to understand the importance of the physiographic factors, analysis and comparing between the biotic factors and also discussing the soil factors and its effects on plant growth. This course deals with the study of vegetation types also brief account about plant adaptations.

Detailed course contents: available at www.gndu.ac.in

Teaching methods:

- Four lectures per week
- Student seminars – one per week
- Assignments to students
- PowerPoint presentations
- Topic based tests
- Quiz

Program learning outcomes:

Knowledge and understanding:

Students will

- Know and understand the concept of plant ecology
- Describe the population interactions in their communities.
- Give the significant differences between biotic and biotic components of ecosystem.
- Describe the structure of ecosystem and environmental factors.
- Describe basic concepts of dynamics of ecosystems.
- List the vegetation and synthetic characteristics of vegetation structure communities.

Intellectual skills:

Students will

- Differentiate between biotic and abiotic components of ecosystem.
- Discover the structure of ecosystem and mineral cycles
- Evaluate the environmental factors that effects on living organisms.
- Conclude the basic knowledge of ecology

Practical skills:

Students will

- Demonstrate the main features of ecosystem structure.
- Demonstrate the main features of population in their communities
- Explain the environmental factors and ecosystem dynamics in the field.

Transferable skills:

Students will

- Exchange ideas, principles and information by oral, written and visual means.
- Use the information technology to gather information and write reports.

Modes of assessment	Minimum score required (to qualify for the next exam/ class)	Schedule
Continues internal evaluation (CIE)		
19. Class tests (unit wise)	40%	After each unit
20. Student seminar		Every week
21. In house exams	35%	Third week of March
End of semester exam	35%	Last week of April/ First week of May

Teaching outline:

Unit	Teaching dates
I	11 January to 3 February
II	6 February to 25 February
III	28 February to 19 March
IV	24 March to 10 April
Revision	Till April 30 th

Attendance policy:

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing when they will be detained from appearing in university exams.

Text books:

Sharma, P. D. Ecology and Environment. Rastogi Publications, Meerut.

References:

1. Kumar, H.D. (2011). Modern Concepts of Ecology. Vikas Publishing House, New Delhi.
2. Mackenzie, A. et al., 1999. Instant Notes in Ecology. Viva Book Pvt. Ltd., New Delhi.
3. Odum, E.P. and Barrett, G.W. (2012). Fundamentals of Ecology. Cengage Learning India Pvt. Ltd., New Delhi.
4. Sharma, P.D. (2013). Environmental Biology. Rastogi Publications, Meerut.
5. Simpson, B.B. and Conner-Ogozaly, M. (1986). Economic Botany-Plants in Our World. Tata McGraw Hill, New York.
6. Krebs, C.J. (1989). Ecological Methodology. Harper and Row, New York, USA.
7. Ludwig, J.A. and Reynolds, J.F. (1988). Statistical Ecology, Wiley, New York.
8. Moore, P.W. and Chapman, S.B. (1986). Methods in Plant Ecology, Blackwell Scientific Publications.

E-resources:

<https://sciencing.com/definition-abiotic-biotic-factors-8259629.html>

<https://courses.lumenlearning.com/wmopen-biology2/chapter/biotic-and-abiotic-factors/>

<https://www.thinktrees.org/wp-content/uploads/2017/03/Plant-Adaptations.pdf>

<https://www.slideshare.net/VivekSrivastava22/plant-adaptations-37080320>

<https://www.nature.com/scitable/knowledge/library/principles-of-landscape-ecology-13260702>

<https://www.sciencedirect.com/topics/earth-and-planetary-sciences/landscape-ecology>

CURRICULUM PLANNING AND IMPLEMENTATION

Paper - VI B: ECONOMIC BOTANY

Class: B.Sc (MEDICAL)

Sem: VI

Name of the Teacher: Ms. Devika Gandhi

Availability timings: 9:00 AM to 4:30 PM

Email: devikabotanylkc@gmail.com

Objectives of the course:

This course aims to study of the relationship between people and plants. This link between botany and anthropology explores the ways humans use plants for food, medicines and commerce.

Course content:

The course provides an introduction to Food plants, Fibres and Vegetable Oils, Spices, Medicinal Plants, Beverages, Rubber, Firewood, Timber and Bamboos. It provide information to understand the economic importance of the all plants.

Detailed course contents: available at www.gndu.ac.in

Teaching methods:

- Four lectures per week
- Student seminars
- Assignments to students
- PowerPoint presentations
- Topic based tests

Program learning outcomes:

Knowledge and understanding:

Students will

- Know and understand the concept of economic botany and relate with environment, populations, communities and ecosystems
- Develop a basic knowledge of taxonomic diversity and important families of useful plants.
- Increase the awareness and appreciation of plants & plant products encountered in everyday life

Intellectual skills:

Students will

- Able to careful taxonomic work and physiological principles, recognition of ecological relationships.
- Evaluate the environmental factors that effects on different plant species.
- Conclude the basic knowledge of economically important plants

Practical skills:

Students will

- Demonstrate the main features of economically important plant species.
- Able to demonstrate the technique for the microscopic examination of starch, cellulose in plant parts
- Explain the plant parts for the common use.

Transferable skills:

Students will

- Exchange ideas, principles and information by oral, written and visual means.
- Use the information technology to gather information and right reports.
- Ability to work as a part of team

Modes of assessment	Minimum score required (to qualify for the next exam/ class)	Schedule
Continues internal evaluation (CIE)		
1. Class tests (unit wise)	40%	After each unit
2. Student seminar		Every week
3. In house exams	35%	Third week of March
End of semester exam	35%	Last week of April/ First week of May

Teaching outline:

Unit	Teaching dates
I	11 January to 30 January
II	03 February to 20 February
III	24 February to 12 March
IV	16 March to 09 April
Revision	Till 30 April

Attendance policy:

Lecture attendance is mandatory. Students are expected to maintain 75% attendance of the total lectures delivered, failing when they will be detained from appearing in university exams.

Text books:

1. Kocchar, S.L. (2000). Economic Botany of the Tropics, Macmillan India Pvt. Ltd., New Delhi.

References:

1. Council of Scientific & Industrial Research (1986). The Useful Plants of India. Publications and Information Directorate. CSIR, New Delhi.
2. Das, K. (2010). Medicinal plants- Their importance in Pharmaceutical Sciences, Kalyani Publishers, New Delhi.
3. Prinintel, D. and Hall, C.W. (Eds.) (1989). Food and Natural Resources. Academic Press, London, New York.
4. Reddy, K. et al. (2007). Advances in Medicinal plants, Universities Press, Hyderabad.
5. Sharma, O.P. (1996). Hill's Economic Botany. Tata McGraw Hill Co. Ltd., New Delhi.
6. Swaminathan, M.S. and Kocchar, S.L. (Eds) (1989). Plants and Society. Macmillan Publications Ltd., London.
7. Verma, V. (2009). Textbook of Economic Botany, ANE Books, New Delhi.

E-resources:

<https://www.slideshare.net/shalinipandey77985/medicinal-plants-27019694>

<http://www.plantdiversityofsaudiArabia.info/Biodiversity-Saudi-Arabia/Economic-plants/Ethenobotany.htm>

<https://www.pdfdrive.com/world-spice-plants-economic-usage-botany-taxonomy-e15064384.html>

<https://www.pdfdrive.com/economic-botany-e33435764.html>