UG PROGRAM (4 Years Honors)

CBCS - 2020-21

B. Sc
FORESTRY

Syllabus and Model Question Papers

DETAILS OF COURSES AND CREDITS

Semester	Course	Title of the Course	Hrs.	Credits	IE	EE	Total
FIRST YEAR							
Sem-I	1	Introduction to Forestry	4	4	25	75	100
		Practical - 1	2	1	-	50	50
Sem-II	2	Silviculture, Wood Anatomy and Dendrology	4	4	25	75	100
		Practical - 2	2	1	-	50	50
SECOND YEAR							
Sem-III	3	Forest Protection	4	4	25	75	100
		Practical - 3	2	1	-	50	50
Sem-IV	4	Wild life Biology	4	4	25	75	100
		Practical - 4	2	1	-	50	50
	5	Forest Ecology and Biodiversity Conservation	4	4	25	75	100
		Practical - 5	2	1	-	50	50
THIRD YEAR							
Sem-V	6	Domain related Skill Enhancement Courses (02). Three (3) pairs of courses (each pair has 2 related courses) will be offered, student has to choose a pair of courses.	4	4	25	75	100
			2	1	-	50	50
	7		4	4	25	75	100
			2	1	-	50	50

B. Sc	Semester – I	Credits: 04
Course: 1	Introduction to Forestry	Hrs/Wk:04

Learning Outcomes: On successful completion of this course, the students will be able to:

- Understand the history and importance of forests and forestry in relation to products and climate.
- Identify, classify and explain the features of forests in India.
- Discuss the soils in forests and the process of soil formation.
- Demonstrate skills on determination of physico-chemical characteristics of soil.
- Explain the biotic and abiotic components of the forest ecosystem.
- Acquire critical knowledge on methods to estimate primary productivity.

UNIT - I: Principles of Forestry 12 Hrs.

1. Forest and Forestry: Definitions, history of forestry.
2. Divisions of forestry and interrelations; forest resources.
3. Importance of forests – Direct and indirect benefits.

UNIT - II: Forest Types 12 Hrs.

1. Forest types in India.
2. Forest types in South India.
3. Forests in Andhra Pradesh.

UNIT - III: Forest Soils 12 Hrs.

1. Classification of forest soils.
2. Factors effecting soil formation.
3. Physical and chemical properties of soil.

UNIT - IV: Ecosystems 12 Hrs.

1. Ecosystem: Definition and components; food chain, food web and ecological pyramids.
2. Biotic components in forests.
3. Abiotic components in forests.

UNIT - V: Forest Ecology 12 Hrs.

1. Ecological succession: Definition and process.
2. Climax communities in forests.
3. Primary productivity: Definition and estimation methods.

TEXT BOOKS:

1. Grebner, D.L., Bettinger, P.and Siry, J.P. 2012. Introduction to Forestry and Natural Resources. Academic Press. 508p (Google eBook).
2. Champion and Seth. 1968. Forest types of India.
3. Mitchell Beazly.1981. The International Book of the Forest. Mitchell Beazly Publishers, London.
4. Dwivedi,A.P.1980.Forestry in India, Jugal Kishore and Company, Dehradun
5. Ram Prakash and Drake Hocking.1986. Some favourite trees for fuel and fodder, International book distributor, Dehradun.

B. Sc	Semester – I	Credits: 01
Course: 1(L)	Practical-1	Hrs/Wk:02

Practical syllabus of Forestry Core Course – 1/ Semester – I
Introduction to Forestry
(Total hours of teaching – 30 @ 02 Hrs./Week)

Learning Outcomes: On successful completion of this practical course, student shall be able to:

- Identify and classify the resources and products of forests.
- Demonstrate skills on various methods to estimate physico-chemical methods of soils.
- Identify and classify the biotic and abiotic components in the forest.
- Estimate primary productivity.

Practicals:

1. Determination of soil moistures of forest soils.
2. Mechanical analysis of soil.
3. Estimation of soil PH.
4. Determination of organic matter in soils.
5. Determination of Nitrogen, Phosphorus, Potassium and Calcium in forest soils.
6. Determination of field capacity of the forest soil.
7. Estimation of primary productivity.
8. Visit to local forest-based industries, GCC and forest department office

MODEL QUESTION PAPER (SEM - END)
B.Sc. DEGREE EXAMINATION
Semester - I
Course 1: Forest Protection

Max. Time: 3 Hrs. **Max. Marks: 75**

SECTION – A

Answer any FIVE questions **5 x 5 = 25 M**

1. History of forestry
2. Tropical forests
3. Forests in Andhra Pradesh
4. Physical properties of soil
5. Nature of forest soils
6. Ecological pyramids
7. Nitrogen cycle
8. Poly climax theory

SECTION – B

Answer ALL the questions **5 x 10 = 50 M**

9. (a) Define forest resources. Discuss about various forest resources with their distinctive features.

(OR)

(b) Define forest. Write an essay on direct and indirect benefits of forests.

10. (a) Write an essay on different types of forests in India.

(OR)

(b) Discuss about various types of forests in South India.

11. (a) Discuss the classification of soils with their characteristic features.

(OR)

(b) Describe the process of soil formation and factors effecting it.

12. (a) Describe the biotic and abiotic components in a forest ecosystem. Add a note on their role and significance.

(OR)

(b) Write an essay on features of forest ecology and its maintenance.

13. (a) What is meant by primary productivity? Explain how it is estimated?

(OR)

(b) What is meant by ecological succession? Discuss about the interrelationships between ecological succession and climate.

Model Question Paper for Practical Examination
I Semester /Horticulture Core Course - 1
Fundamentals of Horticulture and Soil Science

Max. Time: 3 Hrs. **Max. Marks: 50**

1. Determine the moisture in the given soil sample. 10 M
2. Determine the organic matter in the given soil sample. 10 M
3. Determination of field capacity of the given soil. 10 M
4. Submission of a report on biotic and abiotic components in a forest of their locality / resources and products of the forest/ethnic groups in local forest and their livelihoods. 10 M
5. Record + viva voice 6 + 4 =10 M

Suggested co-curricular activities for Horticulture Core Course – 1 in Semester- I:

A. Measurable:

a. Student seminars:

1. Geographical distribution of forests and their classification.
2. Classification of forests in India and Andhra Pradesh.
3. Factors influencing distribution of forests
4. Agricultural lands and forests – Agroforestry.
5. Biodiversity in forests of India and Andhra Pradesh.
6. Productivity potential and increment of world forests.
7. Differences in nutrient cycling.
8. Global warming; forestry options for mitigation and adaptation- carbon sequestration.
9. Forest based industries in developed and developing countries with special reference to India in general and Andhra Pradesh in particular.

b. Student Study Projects:

1. A report on forest cover in Andhra Pradesh and East Godavari District.
2. A report on forest department employees in their locality and their nature of duties.
3. Report on soils from the forest from their locality.
4. Report on various forest plants and products of their locality.
5. Report on animals in the local forest and their conservation status.
6. Testing of soil samples for pH, organic matter and mineral nutrients.
7. Collection of different forest products.
8. National and international organizations in forestry.
9. A report on local trading of forest products and activities of GCC.

c. Assignments: Written assignment at home / during '0' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General:

1. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.
2. Visit to local forest, GCC and forest department office/research station

B. Sc	Semester – II	Credits: 04
Course: 2	Silviculture, Wood Anatomy and Dendrology	Hrs/Wk:04

Learning Outcomes: On successful completion of this course, the students will be able to:

- Understand the concept of silviculture and factors influencing it.
- Explain various cultural operations in developing a forest.
- Acquire a critical knowledge on formation of wood and its characteristic features.
- Discuss different aspects related to dendrology – plant products.
- Demonstrate skills on determining the quality of wood.

UNIT - I: Introduction to Silviculture

1. Silviculture: Definition, objectives and scope; trees and their distinguishing features; taxonomic classification of major tree species.
2. Soil moisture and its influence on forest plants; physiographic factors - influence of altitude, latitude, aspect and slope on vegetation.
3. Biotic factors - influence of plants, insects, wild animals, man and domestic animals on forest vegetation.

UNIT - II: Tending and cultural operations

1. Designing and planting of a forest; weeding- kinds of weeding; impacts of controlled burning and grazing.
2. Release operations- singling, cleaning – liberation cutting - girdling - chemical treatment - peeling.
3. Thinning - kinds of thinning - improvement felling - salvage cuttings - pruning- pollarding, lopping.

UNIT–III: Wood Anatomy

1. The secondary growth in woody plants; mechanism of wood formation in general and with special reference to typical dicot stem.
2. Transformation of sapwood to heartwood; factors affecting transformation.
3. Physical features of wood: Colour, hardness, weight, texture, grain, lusture, etc. Abnormalities in wood - deviation from typical growth form (leaning, bending, crook, fork, buttress), grain deviation, false and discontinuous growth rings.

UNIT-IV: Dendrology-1

1. Dendrology: Definition, general form of woody trunk and deviations like buttresses, flutes, crooks, etc.
2. Morphology and description of bark of common Indian trees including types of exfoliation patterns in bark.
3. Characteristics of blaze on bark, colour, gums, latex, resins, oleo – gum - resins; common trees yielding tannins, gums, resins and other secondary products.

UNIT -V: Dendrology-2

1. Herbarium techniques, collection, processing and preservation of plant material.
2. General study of arboretum, palmetum, fruticetum, bambusetum and xylarium.
3. Methods of measuring diameter, girth and volume of trees yield calculation; pores and vessels, tracheids, ring porous diffused porous; tylosis and their importance in the utilization of wood products.

REFERENCES BOOKS:

1. Lal, J. B. 2003. Tropical Silviculture, New Imperatives: New Systems, International Book Distributors, Dehra Dun.
2. Dwivedi. A. P. 1993. Textbook of Silviculture. International Book Distributors. Dehra Dun.
3. D. N. Tewari, 1992. Tropical Forestry in India. International Book Distributors, Dehradun.
4. K. C. Sahni, 2000. The Book of Indian Trees. Bombay Natural History Society. Mumbai.
5. Rao, R. K. and Juneja, K. B. S., 1971. Field identification of fifty important timbers of India. Indian Council of Forestry Research and Education, New Forest, Dehra Dun.
6. Panshin, A. J. and De Zeeuw, C. 1980. Textbook of wood technology, 4th Ed. McGrawHill. New York, USA.

B. Sc	Semester – II	Credits: 01
Course: 2(L)	Practical - 2	Hrs/Wk:02

Learning Outcomes : On successful completion of this practical course, student shall be able to:

1. Identify and classify different forest trees and shrubs of their locality.
2. Demonstrate skills on planting methods.
3. Acquire skills on analyzing micro- and macroscopic features wood to identify specific timber yielding plant species.
4. Measure the timber and calculate the yield.

Practical syllabus:

1. Identification of trees and shrubs in local forest based on morphological features.
2. Study the tools and materials for plantation establishment.
3. Planting methods and techniques for different types of plantations.
4. Observations on tending operations- weeding, cleaning, singling, pruning, pollarding, lopping and thinning.
5. Microscopic study of any two woods of timber yielding plants for xylem elements.
6. Study of gross anatomical features of wood for field identification of neem, teak, tella Maddi and vegisa.
7. Preparation of herbarium of local trees, shrubs and herbs.
7. Measurement of felled timber and yield calculation.

MODEL QUESTION PAPER (SEM - END)
B.Sc DEGREE EXAMINATION
Semester - II
Course 2: Silviculture, Wood Anatomy and Dendrology

Max. Time: 3 Hrs. Max. Marks: 75

SECTION – A

Answer any **FIVE** questions. 5 x 5 = 25 M

1. Objectives and scope of silviculture
2. Soil moisture and its influence on forest plants
3. Kinds of weeding
4. Impacts of controlled burning and grazing
5. Transformation of sapwood to heartwood
6. Abnormalities in wood
7. Common trees yielding secondary metabolites.
8. Tylosis and their importance in the utilization of wood products.

SECTION – B

Answer **ALL** the questions. 5 x 10 = 50 M

9. (a) Define silviculture. Write an essay on taxonomic classification of major trees.

(OR)

(b) Discuss the biotic factors influencing the forest vegetation.

10. (a) Write an essay on designing and planting of a forest.

(OR)

(b) Define thinning. Discuss different types of thinning practiced in silviculture.

11. (a) Describe the secondary growth in woody plants. Add a note on mechanism of wood formation.

(OR)

(b) Write an essay on different physical features of wood.

12. (a) What is meant by dendrology? Describe the general form of woody trunk and various deviations.

(OR)

(b) Give an account of morphology and description of bark of common Indian trees.

13. (a) Define herbarium. Write an essay on herbarium techniques.

(OR)

(b) Discuss the methods of measuring diameter, girth and volume of trees yield calculation

Model Question Paper for Practical Examination
I Semester /Horticulture Core Course - 2
Silviculture, Wood Anatomy and Dendrology

Max. Time: 3 Hrs. **Max. Marks: 50**

1. Demonstrate the planting method for developing a forest. 10 M
2. Demonstrate tending techniques in developing a forest. 10 M
3. Microscopic preparation of xylem elements of a given wood. 10 M
4. Submission of a report on local trees and shrubs along with 10 herbarium sheets prepared. 10 M
5. Record + viva voice 6 + 4 =10 M

Suggested co-curricular activities for Forestry Core Course – 2 in Semester- II:

A. Measurable:

a. Student seminars:

1. Growth - development and reproduction of forest plants - flowering, fruiting and seeding behavior.
2. Site factors in a forest - climatic, edaphic, physiographic, biotic and their interactions.
3. Climatic factors influencing forest vegetation.
4. Three dimensional features of wood - transverse, tangential and radial surfaces.
5. Reaction wood-compression and tension wood.
6. Allelopathic interactions of forest trees.
7. Endemic, rare, endangered, threatened and exotic trees of India
8. Important timber yielding plants in Andhra Pradesh and East Godavari District.

b. Student Study Projects:

1. A report on woody plants in a local forest.
2. A report on extraction method for gum karaya.
3. A report on extraction of rubber from Hevea brasiliensis.
4. A report on xylem elements in any two timber yielding plants.
5. A report on macroscopic features of woods in some timber yielding plants.
6. Collection of different wood products.
7. A report on research institutes working on wood anatomy, silviculture and dendrology.

a. A report on local timber trading firms – Government and private sectors – various timbers of trading – quality parameters.

c. Assignments: Written assignment at home / during '0' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General:

1. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.
2. Visit to local forest area; forest department timber depot, forest department office/research station; local saw mills.

B. Sc	Semester – III	Credits: 04
Course: 3	Forest Protection	Hrs/Wk:04

Learning Outcomes: On successful completion of this course, the students will be able to:

- Understand the causes of forest fires and their control methods.
- Discuss the human activities causing damage to forests.
- Explain the weed and disease management in forestry.
- Identify and classify the diseases of forest plants.
- Explain the pests in forests and their control methods.
- Acquire critical knowledge on forest protection**.**

UNIT - I: Forest fires - control **12 Hrs.**

1. Introduction, Importance of protection in Indian Forestry; classification of injurious agencies.
2. Injury to forest due to fires, causes and character of forest fires; fire prevention activity, fire suppression.
3. Fire-fighting equipment; fire control policy and objectives; fire-fighting in other countries.

UNIT - II: Human activities in forests **12 Hrs.**

1. Injury to forest due to man: lopping, cutting for fuel wood.
2. Different types of encroachment, control of encroachment; illegal felling of trees; method of control legislation.
3. Live fences with special reference to *Caesalpinia bonduc*.

UNIT - III: Weed and disease management **12 Hrs.**

1. Forest weeds and weed management; management of woody climbers, parasites and epiphytes.
2. Importance of Forest Pathology, tree disease classification.
3. Principles of tree disease management; causes and symptoms; losses due to forest tree diseases.

UNIT - IV: Diseases of forest plants **12 Hrs.**

Etiology, symptoms, mode of spread, epidemiology and management, including chemical, biological, cultural and silvicultural practices.

1. Root diseases (wilt, root and butt rot).
2. Stem diseases (heart rots, stem blisters, rusts, stem wilt, cankers, pink diseases, gummosis, water blister).
3. Foliar diseases (rust, powdery mildew, leaf spot, leaf and twig blight, abnormal leaf fall, needle blight etc.).

UNIT - V: Forest entomology **12 Hrs.**

1. Forest Entomology in India. Classification of forest pests: types of damages and symptoms; factors for outbreak of pests.
2. Methods and principles of pest control: silvicultural, legal, biological and chemical.
3. Principles and techniques of Integrated Pest Management in forests; methods and principles of pest control: mechanical and physical.

REFERENCES BOOKS:

- Khanna, L.S. 2015. Forest Protection. Khanna Bandhu Publishers, Dehradun
- Negi, S.S. 1983. Forest Protection. Bishen Singh Mahendra Pal Singh Publishers, Dehradun
- Tainter, F. H. and F. A. Baker. 1996. Principles of Forest Pathology. Wiley Publishers, USA
- Prasad, T.V. 2019. Handbook of Entomology. New Vishal Publications, New Delhi

B. Sc	Semester – III	Credits: 01
Course: 3(L)	Practical-3	Hrs/Wk:02

Practical syllabus of Forestry Core Course – 3/ Semester – III
Forest Protection
(Total hours of teaching – 30 @ 02 Hrs./Week)

Learning Outcomes: On successful completion of this practical course, student shall be able to:

- Handle the fire-fighting machinery.
- Identify the organisms responsible for spoilage of forest plants.
- Identify and classify the plant pathogens and pests in forests.
- Isolate the soil fauna from forests.

Practicals:

1. Study of machinery used for fire control.
2. Identification of weeds, parasites and epiphytes.
3. Observation of symptoms in laboratory and in forests.
4. Examination of scrapings: host-parasite relationships - causal organisms of root, stem and foliar diseases in theory.
5. Examination of cultures of important forest pathogens.
6. Insect pests of forest seeds, forest nurseries and standing trees.
7. Methods of isolating soil invertebrate macro and micro fauna.
8. Insecticides and their formulations, plant protection appliances.

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MODEL QUESTION PAPER (SEM - END)
B.Sc. DEGREE EXAMINATION
Semester - III
Course 3: Forest Protection

Max. Time: 3 Hrs. **Max. Marks: 75**

SECTION – A

Answer any FIVE questions **5 x 5 = 25 M**

1. Fire control policy and objectives
2. Fire suppression
3. Epiphytes in forests
4. Losses due to forest tree diseases
5. Butt rot
6. Gummosis
7. Silvicultural pest control
8. Mechanical pest control in forests

SECTION – B

Answer ALL the questions **5 x 10 = 50 M**

9 (a) Write an essay on classification of injurious agencies in Indian forests.

(OR)

(b) Discuss the injury to forest due to fires. Add a note on causes and character of forest fires.

10. (a) Write an essay on injury to forest due to man.

(OR)

(b) Discuss about different types of encroachment in Indian forests and their control.

11. (a) Discuss the forest weeds and weed management.

(OR)

(b) Write an essay on tree disease classification.

12. (a) Describe the stem disease symptoms of forest trees and their causes.

(OR)

(b) Write an essay on foliar diseases of forest trees.

13. (a) Discuss the classification of forest pests. Add note on types of damages and symptoms.

(OR)

(b) Explain the principles and techniques of Integrated Pest Management in forests.

Model Question Paper for Practical Examination
III Semester /Horticulture Core Course - 3
Forest Protection

Max. Time: 3 Hrs. **Max. Marks: 50**

1. Fire-fighting machinery principles and application. 10 M
2. Determine the root/stem/foliar disease of forest plant. 10 M
3. Identification of weeds/epiphytes. 10 M
4. Isolate a macro or micro faunal organism from forest soil. 10 M
5. Record + viva voce 6 + 4 =10 M

Suggested co-curricular activities for Horticulture Core Course – 1 in Semester- I:

A. Measurable:

a. Student seminars:

1. Regulated and planned cutting of forest trees.
2. Forest fires in different countries and control over forest fires.
3. Different causes for forest fires.
4. Check over forest clearance for agricultural and habitation purposes.
5. Proper utilization of forest and forest products.
6. Reforestation and afforestation.
7. Role of Government in forest conservation.
8. Forest management in A.P. and E.G.Dt.
9. Diseases of forest plants due to physiological causes and abiotic agents.

b. Student Study Projects:

1. A report on forest areas with fire damages in Andhra Pradesh and East Godavari District by studying fire registers as records.
2. A report on encroachment problems caused due to disturbance.
3. Report on illegally felled forest areas in A.P. and E.G.Dt.
4. Report on Insect pests of forest seeds and forest nurseries.
5. Report on pests of standing trees, freshly felled trees and finished products.
6. A report on macro and micro invertebrate fauna of forest soil samples.
7. Collection of different forest pests and making herbarium.
8. Collecting data on diseases of forest trees in in A.P. and E.G.Dt.
9. Role of sacred groves in forest protection.

c. Assignments: Written assignment at home / during '0' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General:

1. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.
2. Visit to a fire station in a forest locality, and forest department office/research station to learn about forest protection and management.

B. Sc	Semester – IV	Credits: 04
Course: 4	Wild life Biology	Hrs/Wk:04

Learning Outcomes: On successful completion of this course, the students will be able to:

- Understand the significance and value of wildlife.
- Discuss the threats to wildlife and management.
- Acquire a critical knowledge on methods used in wildlife census.
- Discuss *in-situ* and *ex-situ* methods of wildlife conservation.
- Acquire skills on captive breeding techniques.

UNIT - I: Introduction to wildlife

1. Wildlife: Definition and scope; Causes of wildlife depletion, need for wildlife conservation.
2. Values of Wildlife: Ethical, cultural, scientific, economical, aesthetic and negative values.
3. Rare, endangered, threatened and endemic species of fishes, amphibians, reptiles, birds and mammals in India.

UNIT - II: Wildlife ecology

1. Biotic factors, biological basis of wildlife, productivity.
2. Effect of light and temperature on animals; Zoogeographical regions (Animal Distribution).
3. Basic requirements of wildlife: food, water, shelter, space, limiting factors.

UNIT-III: Wildlife management

1. Vegetative analyses – Point Centered Quadrat, Quadrat, Strip transect.
2. GIS and Remote sensing in wildlife habitat survey; Habitat manipulation: food, water, shade improvement; impact and removal of invasive alien species.
3. Making observations and records: field notes, datasheets; Wildlife Photography - Types of cameras, camera traps.
4. Field equipment: altimeter, pedometer, field compass, binoculars; radio collaring; GPS; GIS; Remote sensing in Wildlife management.

UNIT–IV: Wildlife census

1. Planning census, total counts, sample counts; basic concepts and applications.
2. Direct counts (block count, transect methods, Point counts, visual encounter survey, water hole survey).
3. Indirect count (Call count, track and signs, pellet count, pugmark, camera trap).
4. Identifying animals based on indirect signs; capture-recapture techniques.

UNIT -V: Wildlife - conservation

1. *In-situ* and *ex-situ* conservation: definition, formation, management and administration of Wildlife Sanctuaries, National Parks, Tiger Reserves and Biosphere Reserves.
2. Wildlife Projects: Tiger, Elephant, Lion and Hangul; Zoos and Zoological Parks: Definition-Aims of Zoos - Formation and Management of Zoos and Zoological Parks - Central Zoo Authority of India.
3. Captive breeding: aims, principles, methods; role of Government and Non-Governmental Organizations in conservation.

REFERENCES BOOKS:

1. Dasmann, R.F. 1982. Wildlife Biology. Wiley Eastern Ltd. New Delhi.
2. Rajesh, G. 1995. Fundamentals of Wildlife Management, Justice Home, Allahabad.
3. Mills, L. S. 2013. Conservation of Wildlife Populations Demography, Genetics and Management. Wiley-Blackwell, New Jersey, USA
4. Sawarkar, B. 2005. Wildlife Management. Wildlife Institute of India. Dehradun.
5. Wildlife Institute of India (2004) Compendium on the notes on the course Captive management of Endangered Species. Wildlife Institute of India. Dehradun.

B. Sc	Semester – IV	Credits: 01
Course: 4(L)	Practical - 4	Hrs/Wk:02

Learning Outcomes: On successful completion of this practical course, student shall be able to:

1. Collect data on wild animal population in a forest.
2. Demonstrate skills on identifying the animal based on pug-mark.
3. Acquire knowledge on diseases of wild animals and their treatment.
4. Track the movements of wild animals.

Practical syllabus:

1. Demonstration of equipment used in capturing and handling of wild animals.
2. Pugmark Identification and characterization of common large mammals.
3. Use of different techniques in identification of different parts and products of flora and fauna reported in the wildlife trade.
4. Field data collection for estimating population abundance of mammals using line transects, occupancy survey and point counts.
5. Knowledge of tags, collars, radio-tracking equipment.
6. Record of treatment of an ill/ injured wild animal.
7. Species identification through morphometry of hair.
8. Major viral, bacterial, protozoan, fungal and parasitic diseases of Indian wild mammals, birds, amphibian and reptiles.
9. An approach to rescue of wild animals.

MODEL QUESTION PAPER (SEM - END)
B.Sc. DEGREE EXAMINATION
Semester - IV
Course 4: Wild life Biology

Max. Time: 3 Hrs. **Max. Marks: 75**

SECTION – A

Answer any FIVE questions. **5 x 5 = 25 M**

1. Causes of wildlife depletion
2. Endemic fish species of India
3. Biological basis of wildlife
4. Point Centered Quadrat
5. Remote sensing in Wildlife management.
6. Applications of wildlife census
7. Biosphere reserves
8. Central Zoo Authority of India.

SECTION – B

Answer ALL the questions. **5 x 10 = 50 M**

9. (a) Write an essay on different values of wildlife.

(OR)

(b) Discuss the rare, endangered, threatened and endemic mammalian species in India.

10. (a) Discuss the effect of temperature on animals.

(OR)

(b) Describe the basic requirements of wildlife.

11. (a) Write an essay on wildlife Photography.

(OR)

(b) Discuss the habitat manipulation for wildlife.

12. (a) Explain various direct count methods used in wildlife census.

(OR)

(b) Give an account capture and re-capture techniques in wildlife.

13. (a) Discuss about any two wildlife projects in India.

(OR)

(b) Explain the aims and principles of captive breeding.

Model Question Paper for Practical Examination
IV Semester /Horticulture Core Course - 4
Wild life Biology

Max. Time: 3 Hrs. **Max. Marks: 50**

1.	Identification of wild animal using pug-mark	10 M
2.	Identification of a disease of wild animal	10 M
3.	Handling of equipment used in capturing wild animals.	10 M
4.	Morphometry of hair to identify wild animal.	10 M
5.	Record + viva voce	6 + 4 =10 M

Suggested co-curricular activities for Forestry Core Course – 2 in Semester- II:

A. Measurable:

a. Student seminars:

1. Biological rhythms and bird migration.
2. Types of animal communications.
3. parental care in mammals and birds.
4. Infectious wildlife diseases.
5. Non-infectious diseases of wild animals.
6. Wildlife forensics and its applications in detecting wildlife crimes.
7. Wildlife (Protection) Act, 1972 and its Amendments.
8. Wildlife trade and regulations.
9. Biodiversity Act 2000.

b. Student Study Projects:

1. A report on eco-development, eco- restoration and ecotourism programmes.
2. A report on anti-poaching operations.
3. A report on poaching and trading of plant and animal parts/products.
4. A report on impacts of pesticides and heavy metals on birds and mammals.
5. A report on Environmental Impact Assessment (EIA) methods and their role in wildlife conservation.
6. Collection of data on different wild animals in nearby forest.
7. A report on wildlife crimes in A.P. and E.G.Dt.
8. A report on administrative set up - advisory bodies- National Board for Wildlife.

c. Assignments: Written assignment at home / during '0' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General:

1. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.

2. Visit to local forest area; forest department office/research station; local zoological park.

B. Sc	Semester – IV	Credits: 04
Course: 5	Forest Ecology and Biodiversity Conservation	Hrs/Wk:04

Learning Outcomes: On successful completion of this course, the students will be able to:

- Understand the significance and value of wildlife.
- Discuss the threats to wildlife and management.
- Acquire a critical knowledge on methods used in wildlife census.
- Discuss *in-situ* and *ex-situ* methods of wildlife conservation.
- Acquire skills on captive breeding techniques.
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UNIT-I: Forest environment

1. Structure of forest ecosystem; forest microclimate.
2. Forest types and forest cover of India with special reference to Andhra Pradesh; tree cover of India and A.P.
3. Characteristic of tropical trees; shoot growth in forest trees; phenology of trees; forest seed dormancy and germination; regeneration ecology of forest trees.

UNIT-II: Forest ecosystem function and dynamics

1. Primary productivity of forest ecosystems; methods of measurement; productivity patterns.
2. Litter production and decomposition; nutrient cycling and nutrient conservation strategies; forest hydrology.
3. Measurement of forest productivity; ecological succession; forest disturbances; forest fragmentation.

UNIT-III: Forest ecosystem management

1. History of forest management in India; joint forest management; forest fire; plantation forestry.
2. Application of remote sensing technique in forest ecology.
3. Deforestation and approaches to forestry conservation; Changing climate and their impact on forest and soil health.

UNIT-IV: Biodiversity conservation

1. Biodiversity: Definition, global approaches to biodiversity conservation, Indigenous approaches to biodiversity conservation, biodiversity and ethnomedicinal resources.
2. Indian initiatives in biodiversity conservation - biodiversity act 2002, Biodiversity Rules 2004, national biodiversity strategy and action plan (NBSAP).
3. Plant Varieties Protection and Farmer's Rights Act, 2001, National biodiversity authority (NBA).

UNIT-V: Biodiversity - organizations and protocols

1. International programmes for biodiversity conservation, convention on biological diversity (CBD).
2. CITES, ITTA, UNFCCC, Kyoto Protocol, TRIPS, Ramsar Convention on Wet Lands.
3. Cartagena Protocol on Bio-Safety 2000 (CPB); the basal convention on the control of transboundary movement of hazardous wastes and their disposal, The Montreal Protocol, IPR.

REFERENCES BOOKS:

- Saggwal, S.S. 1995. Forest Ecology of India. Pioneer Publishers, India.
- Montagnini, F and Jordan, C.F. 2005. Tropical Forest Ecology: The Basis for Conservation and Management. Springer.
- Frankel, O.H., Brown, A.H.D., Burdon, J.J. 1995. The Conservation of Plant Biodiversity. Cambridge University Press. Cambridge.
- Nautiyal S & Koul, AK. 1999. Forest Biodiversity and its Conservation Practices in India. Oriental Enterprise.

B. Sc	Semester – IV	Credits: 01
Course: 5(L)	Practical - 5	Hrs/Wk:02

Learning Outcomes: On successful completion of this practical course, student shall be able to:

1. Perform skills on basic ecological methods to study a forest community.
2. Demonstrate skills determining biodiversity indices.
3. Acquire knowledge on biomass and litter in a forest area.
4. Decide the number and size of quadrat to study an area.

Practical syllabus:

1. Determination of minimal quadrat size by the species area curve methods.
2. Determination of minimum number of quadrat to be laid down in the field under study
3. Plant/Tree/Wild Life enumeration in protected area/ National Parks/ Wild life sanctuaries.
4. Determination of frequency/density/abundance of vegetation.
5. Measurement of Different Biodiversity Indices (Simpson's Biodiversity Index, Shannon's index, Brillouin index).
6. Determine the community structure of a forest stand.
7. Determine the biomass (AGB) of tree species by allometric method.
8. Determine the litter accumulation/decomposition in a forest stand.

MODEL QUESTION PAPER (SEM - END)
B.Sc. DEGREE EXAMINATION
Semester - IV
Course 5: Forest Ecology and Biodiversity Conservation

Max. Time: 3 Hrs. **Max. Marks: 75**

SECTION – A

Answer any FIVE questions. **5 x 5 = 25 M**

1. Forest microclimate
2. Forest seed dormancy
3. Forest fragmentation
4. Joint forest management
5. Ethnomedicinal resources
6. National Biodiversity Authority
7. Ramsar Convention on Wet Lands
8. Kyoto Protocol

SECTION – B

Answer ALL the questions. **5 x 10 = 50 M**

9. (a) Write an essay on forest types and forest cover of India.

(OR)

(b) Discuss the shoot growth and phenology of trees.

10. (a) Discuss the methods of measuring primary productivity in forests.

(OR)

(b) Define succession. Discuss about ecological succession.

11. (a) Explain the application of remote sensing technique in forest ecology.

(OR)

(b) Define deforestation. Explain the approaches to forestry conservation.

12. (a) Discuss the global and indigenous approaches to biodiversity conservation.

(OR)

(b) Discuss the biodiversity act 2002, Biodiversity Rules 2004.

13. (a) Discuss about international programmes for biodiversity conservation.

(OR)

(b) Discuss about CITES and ITTA.

Model Question Paper for Practical Examination
IV Semester /Horticulture Core Course - 5
Forest Ecology and Biodiversity Conservation

Max. Time: 3 Hrs. **Max. Marks: 50**

1. Determine the frequency/density/abundance of vegetation based on the data provided 10 M
2. Determine the community structure of a forest stand based on data given. 10 M
3. Determine the biomass of a tree species. 10 M
4. Determine the litter accumulation/decomposition. 10 M
5. Record + viva voce 6 + 4 =10 M

Suggested co-curricular activities for Forestry Core Course – 2 in Semester- II:

A. Measurable:

a. Student seminars:

1. Forest environment- major abiotic and biotic components and their interaction.
2. Nutrient cycling in forests.
3. Trophic levels, food webs, ecological pyramids and energy flow in forest ecosystems.
4. Population and community ecology of forest ecosystems.
5. Theories of succession- climax vegetation type.
6. Island biogeography.
7. Autecology of some important tree species.
8. Principles of conservation biology, Ex situ and In situ methods of conservation methods.
9. Concepts of Biodiversity Management Committees. Concepts of peoples Biodiversity Register.

b. Student Study Projects:

1. A report on tree species in nearby forest.
2. A report on ethnobotanical practices by tribal communities of nearby forest.
3. A report on traditional knowledge of tribal communities in local forest.
4. A report on diversity of birds and mammals in local forest.
5. A report on threats to biodiversity in local forest.
6. A report on deforestation and afforestation in local area.
7. A report on biodiversity conservation steps in A.P. and E.G.Dt.
8. A report on activities of NBA and A.P.State Biodiversity Board.

c. Assignments: Written assignment at home / during '0' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General :

3. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.
4. Visit to local forest area; forest department office/research station; interaction with Biodiversity Management Committee of your district/area.