Gyanmanjari Innovative University

Course Syllabus
Gyanmanjari Science College
Semester-5 (B.Sc.)

Subject: Forensic Botany and Wild Life Forensics - BSCFS15308

Type of course: Major

Prerequisite: Basic understanding of Botany, field work, knowledge of plants, understanding ecosystem processes, and a basis understanding of geosciences.

Rationale: This course covers the subject of botany in investigation process, pollen grains and their study and wildlife study which focuses on how crimes against fauna are investigated and laws related to them.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				ESE		CCE			
CI	T	P	C	Theory	Practical	MSE	LWA/V	ALA	
3	0	2	4	75	25	30	20	50	200

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; SEE - Semester End Evaluation; MSE- Mid Semester Examination; LWA - Lab Work Assessment; V – Viva voce; CCE-Continuous and Comprehensive Evaluation; ALA- Active Learning Activities.

3 Credits * 25 Marks = 75 Marks (each credit carries 25 Marks) Theory
1 Credits * 25 Marks = 25 Marks (each credit carries 25 Marks) Practical
SEE 100 Marks will be converted in to 50 Marks
CCE 100 Marks will be converted in to 50 Marks
It is compulsory to pass in each individual component.

Course Content:

Unit No	Course Content	Hrs	% Weightage
1	**Forensic Botany:** Introduction, botanical evidence from plants, evidence	10	25%

	gathering, handling and preservation, sub divisions in forensic botany, palynology, bryology, limnology, ecology and systematization of plants, plant morphology, dendrochronology, mycology. Botanical evidence: wood identification, soil identification.		
2	**Palynology, diatoms:** Palynology: introduction, definition of pollen and spore, subdivision of palynology, pollen preparation, morphology of pollen grains, other pollen types, pollen description. Diatoms: introduction, siliceous cell wall, ecology, applications, extraction methods, Forensic significance.	15	25%
3	**Wild Life Forensics laws and acts:** Introduction, historical value of wildlife, wildlife protection during ancient India, medieval India, legislation on issue of preserving wildlife, wildlife conservation initiative, important projects by Indian government, measures for protection of biodiversity, investigative techniques, wildlife protection act.	10	25%
4	**Wild Life crime scene** Introduction to Wildlife crime and it's impacts, Wildlife crime scene, locating crime scene, crime scene management, securing and protecting wildlife crime scene, scene searching, investigator's role, documentation, evidence, sources of evidence, types of samples, nature of samples, collection and preservation.	10	25%

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	**Leaf the Clues** Provide printed leaves and seeds with distinguishing characteristics (e.g., vein patterns, shapes). Students match them to species charts and determine their origin and upload it on GMIU web Portal.	10

2	**Pollen Puzzle** Hand out microscopic images or descriptions of pollen grains with features like size, shape, and surface patterns. Students match them to their potential plant sources and upload the same on GMIU web Portal.	10
3	**Roots of the Mystery** Present root fragments with descriptions of their morphology and soil types. Students analyze which plant the roots might belong to and link them to the crime scene and upload it to GMIU web Portal.	10
4	**Poacher's Trail** Provide maps with animal migration patterns and descriptions of confiscated wildlife products (e.g., ivory, pelts). Students trace the likely location of illegal poaching and upload it on GMIU web Portal.	10
5	**Attendance**	10
Total		50

List of Practical:

Sr. No	Descriptions	Unit No	Hrs
1	To prepare a detailed account of plant materials of some general plants found in your nearby areas.	1	6
2	To prepare a detailed account of some poisonous plants.	1	3
3	To perform density gradient method to compare questioned soil sample and control soil sample.	1	3
4	To carry out microscopic examination of pollen grains.	2	6
5	To carry out microscopic examination of diatoms.	2	3
6	To cite a crime case in which diatoms have served as forensic evidence.	2	3
7	To prepare detailed account of endangered plant and animal species	3	3
8	To identify Pug marks	4	3
		Total	30

Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks **(Revised Bloom's Taxonomy)**						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30%	40%	30%	00	00	00

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Explore palynology, plant ecology, and limnology for forensic applications.
CO2	Analyze the nature, structure, and forensic significance of diatoms, including extraction and slide preparation.
CO3	Examine plant-based wildlife evidence, including flowers and plants, for identification.
CO4	Investigate international conventions and treaties related to wildlife protection and their enforcement.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
From the content 10% topics are suggested for flipped mode instruction.
Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory
The internal evaluation will be done on the basis of Active Learning Assignment
Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

[1] Hall, David W., and Jason H. Byrd, eds. *Forensic Botany*. Chichester, UK: John Wiley & Sons, Ltd, 2012
[2] Walker, Maryalice. *Entomology and palynology: Evidence from the natural world*. Philadelphia: Mason Crest Publishers, 2006.
[3] Forensic botany – principles and applications to criminal casework- Heather Miller Coyle