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| Programme | BS | Course Code | BOT- 405 | Credit Hours | 2 |
| Course Title | Forensic Botany (Theory) | | | | |
| Introduction | | | | | |
| The course aims to introduce students to the principles and practices of Forensic Botany, exploring various techniques to analyze botanical evidences and implementation in legal cases. | | | | | |
| Learning Outcomes | | | | | |
| By the end of this course, students will be able to: | | | | | |
| <ul style="list-style-type: none"> • Understand how plant can be used in Forensic investigations. • Describe methods for analyzing plant-based evidence. • Explain the role of plant materials in Forensic Science. | | | | | |
| Course Contents | | | | | |
| <ul style="list-style-type: none"> • Plants as trace/transfer evidence • Plants in our society • Plants as poisons • Use of plants as food, fiber, medicine • Recreation • Law enforcement <p>Forensic Botany</p> <ul style="list-style-type: none"> • Introduction to forensic botany • Civil vs Criminal forensic botany <p>Use of Botanical evidence in criminal investigation</p> <ul style="list-style-type: none"> • Use of botanical evidence in criminal investigation • Botanical evidence and crime scene; source, transfer, evidence recognition, collection, preservation and documentation of botanical evidences in criminal investigation <p>Role of Various Disciplines of Botany in Forensic investigation</p> <ul style="list-style-type: none"> • Limnology, Plant Ecology, Plant Entomology, Palynology, Plant Mycology, Plant Anatomy & • Taxonomy & Plant Molecular Biology <p>Forensic Limnology & its application</p> <ul style="list-style-type: none"> • What is forensic limnology? • Aquatic plants (e.g., algae, diatoms) have been useful; • To link suspects to a crime scene • To establish that drowning occurred in freshwater • Can be used for identification purposes • A case study: In 1991, two young boys were brutally attacked by teenage assailants while fishing at a suburban pond in Connecticut or similar cases <p>Forensic Ecology & its application</p> <ul style="list-style-type: none"> • What is forensic ecology? • Role of forensic ecology in criminal cases • Plant ecology (growth patterns of vegetation) useful in estimating time of death • A case study: | | | | | |

Forensic Palynology, history and application

- What is palynology and forensic palynology?
- History of forensic palynology
- Utilization of forensic palynology
- Situations in which palynology can assist an investigation
- Pollen and spores: what, where and why?
- Pollen analysis; How it works
- Sample preparation for pollen analysis
- Interpreting forensic pollen assemblages
- Significance of the pollen evidence at crime scene
- Forensic pollen samples
- Soil, dirt, and dust, fibers from rope, carpets, fur, animal and human hair
- Pollen sample collection, storage and packing materials
- Future of forensic palynology
- A case study: Famous case that exemplifies the use of pollen in criminal casework is described by Horrocks et al. in Auckland, New Zealand or similar cases

Forensic Mycology

- Forensic mycology: definition and fields of applicability
- Fungi and thanotochronology: case studies
- Methods of sampling fungi at a crime scene (outdoor or indoor) environment
- Fungal spores are important micro-traces since, like other palynomorphs
- Forensic mycology use to relate the scene to the defendant by analyzing fungal biota at the crime scene
- A Case Study: Determination of postmortem intervals from mold growth on corpses or similar cases

Forensic Anatomy & its application

- What is forensic anatomy?
- Role of forensic anatomy in criminal cases
- Plant anatomy as leaf morphology and tree growth ring patterns to aid in;
- Species identification
- Performing physical matches of evidence
- A case study: First modern-era case to use such botanical evidence in court; kidnapping and death of Charles Lindbergh's young son in 1932 or similar cases

Forensic Molecular Biology & its application

- What is forensic molecular biology?
- Role of DNA fingerprinting in criminal cases (murder, rapists in rape, parents in case of doubtful parentage) and civil cases (immigration, disputes involving purebred dogs, and in animal conservation studies)
- A case study: first criminal case with legal acceptance using plant DNA typing was a homicide that occurred in 1992 in Arizona's Maricopa County or similar cases
- DNA analysis/DNA profiling/ typing/Fingerprinting
- Applications of DNA fingerprinting in forensic botany
- Detection of genetically modified organisms (GMOs)
- Phylogenetic relationship

Utilization of molecular methods to analyze botanical trace evidence