

# Short-Term Offline Internship on Plant Phytochemical Extraction & Applications

This **4-week internship** is designed for undergraduate biology students interested in phytochemistry, plant-based drug discovery, and biochemical analysis. The program provides hands-on experience in plant extraction techniques, bioactive compound identification, and functional applications in pharmaceutical and nutraceutical research.

---

## Internship Structure & Work Design

### Week 1: Introduction to Phytochemistry & Extraction Techniques

- Overview of primary and secondary metabolites in plants (alkaloids, flavonoids, tannins, terpenoids, phenolics, saponins, etc.)
- Selection and authentication of medicinal plant species
- Sample collection, processing, drying, and storage techniques
- Various solvent-based extraction methods: maceration, Soxhlet extraction, hydro-distillation, percolation
- Introduction to green extraction techniques: supercritical fluid extraction, ultrasound-assisted extraction, microwave-assisted extraction
- Practical session on different extraction techniques

### Week 2: Phytochemical Screening & Compound Identification

- Qualitative phytochemical tests (alkaloids, flavonoids, tannins, saponins, terpenoids, phenolics)
- Quantitative estimation of bioactive compounds (total phenolic and flavonoid content determination)
- Chromatographic techniques for compound separation:
  - Thin-layer chromatography (TLC)
  - High-performance liquid chromatography (HPLC)
  - Gas chromatography-mass spectrometry (GC-MS)
- UV-visible spectroscopy for compound characterization

### Week 3: Bioactivity Testing & Functional Analysis

- Antioxidant activity assays (DPPH, FRAP, ABTS assays)
- Antimicrobial and antifungal assays of plant extracts
- Cytotoxicity screening using cell culture models
- Enzyme inhibition assays for therapeutic applications (acetylcholinesterase, tyrosinase inhibition)
- Comparative analysis of different extraction techniques and their efficiency
- Laboratory-based bioactivity testing and result interpretation

### Week 4: Research Project, Data Analysis & Presentation

- Selection of a research project on a chosen plant extract
- Data collection, statistical analysis, and interpretation

- Scientific writing and report preparation
  - Presentation of research findings in a seminar setting
  - Feedback session and Q&A with expert mentors
  - Certificate distribution and feedback session
- 

## Key Outcomes of the Internship

- **Technical Expertise:** Understanding and hands-on experience in phytochemical extraction, compound separation, and identification techniques.
  - **Research Skills:** Ability to conduct independent research, analyze results, and interpret data for scientific applications.
  - **Practical Knowledge:** Exposure to chromatography, spectroscopy, and in-vitro bioactivity assays.
  - **Publication & Career Advancement:** Opportunities to co-author research papers, build a strong academic profile, and prepare for higher studies or industry roles.
  - **Networking & Mentorship:** Interaction with experts in phytochemistry, pharmacognosy, and drug discovery fields.
  - **Certification:** Recognition of expertise and skill development, enhancing career prospects in pharmaceuticals, biotechnology, and research.
- 

## How to Apply?

- Submit an application via [**Your Institution/Organization Link**]
- Provide an updated CV and a statement of interest
- Limited seats available! Apply before [**Deadline Date**]

For more details, contact:

✉ Email: [**Your Email**]

☎ Phone: [**Your Contact Number**]

🌐 Website: [**Your Website**]

📍 Location: [**Institution Address**]

---