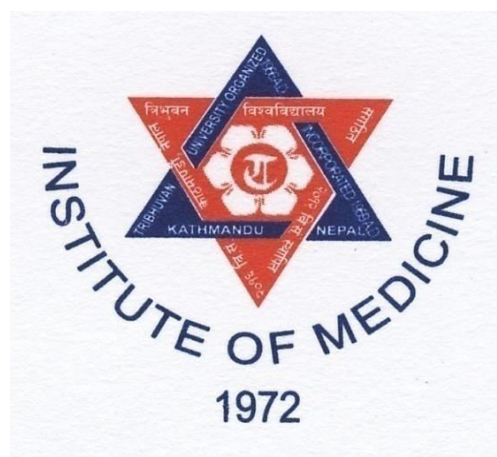


**Curriculum**  
**on**  
**Bachelor in Pharmacy**  
**(B. Pharm)**



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**2020 (2076)**

## PHARMACOGNOSY

Subject: Theory	Year: Second	Code: BP 504 A
Full Marks: 100	Total Teaching hours: 90	Credit hour: 6

**Course Description:** This subject deals with the study of medicinal plants and their secondary metabolites of medicinal importance. It also deals with the extraction, standardization and production techniques of medicinal plants.

### General objectives:

At the end of this course, the students will be able to

- a. Discuss the basic concept and scope of Pharmacognosy and drug development
- b. Describe different classes of secondary metabolites
- c. Discuss different techniques in microscopic evaluation of crude drugs
- d. Develop a concept on the medicinal plants of national importance.

### Specific objectives:

#### Unit 1: Introductory Pharmacognosy: [6 Hrs]

After the completion of the course, students will be to

- a. Discuss definition, Scope **and** recent Trends in Pharmacognosy.
- b. Explain historical background on the use of natural products obtained from plants as therapeutic agent. Discuss ethnomedicinal practices in Nepal.
- c. Explain Bioprospecting and Reverse Pharmacognosy.
- d. Discuss classification of crude drugs
- e. Discuss adulteration in crude drugs

#### Unit 2: Techniques in microscopy: [6 Hrs]

After the completion of the course, students will be able to

- a. Discuss Chemomicroscopy and Micrometry.
- b. Explain Qualitative and Quantitative Microscopic Examination (Leaf constants, Stomata, Trichomes, Vascular bundles, Ergastic substances and Oil glands).

#### Unit 3: Primary and secondary metabolites: [6 Hrs]

After the completion of the course, students will be able to

- a. Discuss difference between primary and secondary metabolites
- b. Briefly outline Acetate Mevalonate Pathway, Deoxyxylulose 5 Phosphate pathway, Shikimic acid Pathway and Polyketide Pathway.
- c. Discuss phytochemical screening for Alkaloids, Terpenoids, Glycosides, Saponins and Tannins.

#### Unit 4: Herbs production and Processing: [4 Hrs]

After the completion of the course, students will be able to

- a. Discuss Processing and Value addition of crude drugs.

**b** Describe Technology for commercial scale cultivation and processing.

**Unit 5: Tannins: [3 Hrs]**

After the completion of the course, students will be able to

Discuss definition, general characteristics, classification, Biological sources, identifying characteristics, chemical constituents, uses and commercial utilization of: Black catechu, Indian gooseberry, Myrobalan, Nutgalls.

**Unit 6: Volatile oils: [9 Hrs]**

After the completion of the course, students will be able to

Discuss definition, general characteristics, general method of extraction and analytical evaluation. Biological sources, identifying characteristics, chemical constituents, uses and commercial utilization of: Mentha, Coriander, Cinnamon, Lavender, Clove, Acorus, Orange peel, Lemon peel, Fennel, Tulsi, Eucalyptus, Sandalwood and Gaultheria.

**Unit 7: Resinous drugs: [7 Hrs]**

After the completion of the course, students will be able to

Discuss definition, general characteristics, classification Biological sources, identifying characteristics, chemical constituents, uses and commercial utilization of: Colophony, Myrrh, Asafoetida, Colocynth, Ginger, Turmeric, Capsicum, Cannabis.

**Unit 8: Lipids/Fixed oil: [8 Hrs]**

After the completion of the course, students will be able to

Discuss definition, general method of extraction and analytical evaluation. Biological sources, identifying characteristics, chemical constituents, uses and commercial utilization of: Arachis oil, Castor oil, Linseed, Sesame oil, Olive oil and Cod liver oil.

**Unit 9: Glycosides: [12 Hrs]**

After the completion of the course, students will be able to

Discuss definition, general characteristics, classification and general method of extraction. Biological sources, identifying characteristics, chemical constituents, uses and commercial utilization of: Digitalis, Squill, Centella, Liquorice, Aloe, Rhubarb, Sapindus, Dioscorea, Bitter Almond and Senna

**Unit 10: Alkaloids: [12 Hrs]**

After the completion of the course, students will be able to

Discuss definition, general characteristics, classification and general method of extraction. Biological sources, identifying characteristics, chemical constituents, uses and commercial utilization of: Belladonna, Rauwolfia, Opium, Cinchona, Lobelia, Ephedra, Nux-Vomica, Vasaka, Ipecac and Aconite.

**Unit 11: Isolation of Phytoconstituents: [5 Hrs]**

After the completion of the course, students will be able to

Discuss Isolation of Atropine, Morphine, Sennoside, Capsaicin, Dioscin and Quinine.

## **Unit 12: Study on selected 30 medicinal plants of Nepal having commercial importance: [12 Hrs]**

After the completion of the course, students will be able to

Discuss Biological source, main chemical constituents, uses and marketing perspective of Panchaunle, Satuwa, Tatelo, Siplican, Thulookhati, Gurjo, Harchur, Setomusali, Pashanvedh, Sunpati, Jatamansi, Kaulo, Nundhiki, Punarnava, Nirmasi, Dudhejhar, Chhatiwan, Indrajau, Kauso, Nagbeli, Dalechuk, Bhojpra, Guchhi Chyau, Patharchatta, Bhringraj, Timur, Sugandhawal, Bishjara, Dronapushpi and Bayovidanga.

### PHARMACOGNOSY

Subject: Practical	Year: Second	Code: BP 504 B
Full Marks: 50	Total Teaching hours: 90	Credit hour: 2

At the end of the course, students will be able to

1. Determine Saponification and Acid value of given fixed oil.
2. Extract volatile oils by Clevenger's method (Hydrodistillation method).
3. Perform extraction of given crude drug by Soxhlet extraction
4. Perform extraction of given crude drug by Reflux condensation
5. Extract and estimate total alkaloids.
6. Extract and estimate total flavonoids.
7. Extract and estimate total tannins.
8. Extract and estimate total Saponins.
9. Extract and estimate total Phytosterol.
10. Prepare different extracts of crude drugs by successive solvent extraction method
11. Perform TLC of given extract.
12. Demonstrate preparative TLC and Column chromatography
13. Isolate Caffeine from tea dust.
14. Isolate Nicotine picrate form tobacco leaves.
15. Isolate Diosgenin form Dioscorea.
16. Isolate Piperine from black pepper.
17. Isolate Glycyrrhizin from Liquorice.
18. Isolate Aloin from Aloes.
19. Extract Curcuminoids from Curcuma longa.
20. Isolate Hesperidin from Orange peel.
21. Isolate Calcium Sennosides from senna leaves.
22. Isolate Lycopene from Tomato.
23. Perform general and specific phytochemical screening of extract for various classes of compounds (Alkaloids, Glycosides, Saponins, Flavonoids and Terpenoids)
24. Demonstrate skill of preparation & labeling of herbarium specimen & explain its significance

25. Prepare detailed monograph of at least one medicinal plant covering Taxonomy, Phytochemistry and Pharmacological investigation with its use in traditional system of medicine.
26. Design one-day field visit to medicinal plant garden, herbarium and plant tissue culture lab.

**Reference books (Latest Editions)**

1. Evans W.C. Trease and Evans Pharmacognosy. W.B. Saunders & co. London.
2. Kokate C K, Purohit A. P, Gokhale S. B. Pharmacognosy (Degree). Nirali Prakashan, Pune.
3. Rangari V. D. Pharmacognosy and Phytochemistry. Career publication, Nashik.
4. Tyler E, Brady R. Pharmacognosy. Philadelphia P.A, U.S.A.
5. Nakanishi K. Chemistry of Natural Products. Kodausha Book Publishing Company, Osaka (Japan).
6. Harborne J.B. Phytochemical Methods. Chapman & Hall, London.
7. Kalia A.N. Textbook of Industrial Pharmacognosy.
8. Wallis T.E. Text Book of Pharmacognosy.