Department of Pharmacognosy

Obafemi Awolowo University, Ile-Ife

Course Code: 201

Course Title: Introduction to Pharmacognosy and Organized Vegetable drugs
UNITS: 2 + 0 + 3; 0 + 0 + 0= 3 units
Objectives:
To link the previous knowledge of the student in biological sciences with Pharmacognosy. To familiarize the student with organized drugs available in the world commerce, their morphological, microscopical and chemical characters.
Course Content:
The scope of Pharmacognosy, Classification of Drugs with a brief mention of plant nomenclature, taxonomy; plant description morphology and anatomy. The living plant cell; cell differentiation and cell contents.
The following plants drugs will be studied: - Digitalis, Senna, Tobacco, Ocimum, *Azadirachta indica, Ficus vogellii, Thevetia spp. Catharanthus roseus; Cascara, Cinnamon,* Cassia bark, Cinchona, Rauwolfia, Ginger, Zanthoxylum, Clove, Pyrethrum, Fennel, Cardamon, Capsicum, Tamarind, Vanilla, *Strophanthus*, Cocoa, Calabar beans, Castor oil beans, Cola Grains of Paradise, *Cannabis sativa*.
Laboratory classes in which the organized drugs and examined macroscopically, microscopically and chemically will complement the lectures.

Course Code: **PCG 202**
Course Title: Unorganized Drugs
UNITS: 0 + 0 + 0 + 1+ 0 + 3 = 2 units
Objective:
To familiarize the student with unorganized drugs available to the Pharmaceutical profession commercially, their morphological, microscopical and chemical characters.
Course Content
This course will deal with the unorganized drugs, fibres and surgical al dressings, The drugs include Acacia, Tragacanth, Agar, Sterculia, Spermaceti, Beeswax, Wool fat, Opium, Aloes, Balsam of Tolu, Balsam of Peru, Styrax, Gelatin, Cotton, Wool, Jute, Hemp, Flax, Silk, Rayon, Bandages and dressings, Cellulose wadding. Rayon dressing; adulteration. Substitution and evaluation of surgical al dressing.
Laboratory classes in which the unorganized drugs are examiner macroscopically, microscopically and chemically will complement the lectures.

Course Code: **PCG 301**
Course Title: Drugs of Biological Origin I
Units: 2 + 0 + 4; 0 + 0 + 0 = 3 units

Objective s:
At the end of the course, the student would have acquired some knowledge about the source, chemical nature and uses of some important drugs of biological origin.
Course C content:
CARBOHYDRATES AND RELATED COMPOUNDS – Concepts, classification biosynthetic origin, and properties. Mannoses and related compounds include fermentation products, Glycosides:- nature,

biosynthetic origin and classification (Holosides, oligosides, sugar, polyosides – guns, mucilages, etc). Heterosides (0-, S-,N,-C- glycosides), amino sugar derived antibiotic.
AMINO ACIDS and PEPTIDES: - Classification, biosynthetic origin, properties applications in Pharmacy.
PURINES, PYRIMIDINES AND RELATED COMPOUNDS (Methylated purines)
VITAMINS – Water and fat soluble, their properties and uses.
ALKALOIDS – Structures, classification, Occurrence, biosynthetic origin, general chemical properties, production and evaluation. Alkaloids derived from ornithine, lysine, nicotinic acid, phenylalanine tyrosine, tryptophan and histidine. Laboratory classes in which the various natural products of pharmaceutical interests are put to test to determine t heir chemical nature and purity will complement the lectures

Course Code: **PCG 302**
COURSE TITLE: Drugs of Biological Origin II
UNIT: 0 + 0 + 0 2 + 0 + 4 = 3 units
Objectives: As in PCG 301
Course Content:
ACETATE AND PROPIONATE DERIVED DRUG- Tetracycline li, Nystatin, Erythromycin- biosynthetic origin, occurrence, classification, properties, Fats and Waxes- Drugs derived from fats, biosynthetic origin, properties and used in pharmacy
POLYKETIDES : Biosynthetic origin, occurrence properties, classification Anthraquinones, flavonoids and relate d compounds e.g. griseofulvin.

ISOPRENOIDS: Concepts, roles, classification, distribution, biosynthetic origin, significance Sterols, steroids, hormones, cardenolides, steroidal saponins and alkaloids.
TERPENOIDS: Essential oils (accumulation, taxonomic significance, biosynthetic origin, occurrence, preparation, properties, terpeneless oils, uses, testing). Resins, Oleoresins and Balsams. Non-volatile terpenoids (cannabinoids, abietic acid).
SKIKIMIDES: Coumarins and derivatives, Lignans, Benzenoids and Gallotannins. Practical classes in which the various natural products of pharmaceutical interest are put to test to determine their chemical nature and purity will complement the lectures.

COURSE CODE: PCG 308

COURSE TITLE: Separation Techniques in Pharmacy

UNITS: 1 + 0 + 0+, 0 +0 + 0 + = 1 unit

Objective:

To expose the student to all separation techniques employed in the analysis of drug and drug products.

Course Content:

Extraction processes used in the preparation of galenicals in Pharmacy; maceration and percolation processes. Hot and cold extractions, continuous hot extraction, principle of partition coefficient between two immiscible liquids. Introduction to the principles and application of the following separation techniques in Pharmacy –the different types of chromatography, paper chromatography (PC), thin layer chromatography (TLC), high pressure liquid chromatography (HPLC) and gas chromatography (GC). Electrophoresis, column chromatography, counter current chromatography, ion exchange, gel filtration.

COURSE COE: **PCG 401**

COURSE TITLE: **Herbal Remedies in Traditional Medicine**

UNITS: **1 + 0 + 0 + 0 + 0 + 0 = 1 unit**

Objectives:

At the end of the course, the student should be able to understand the basic principles of the tradition al healing methods as well as have a working knowledge of the most commonly used herbal drugs in Nigeria. The beneficial and adverse features of traditional form of Health Care will be obvious to the student such that he is better able to work in a community where both traditional and modern forms of treatment (and more of the traditional) are in use. The course will also equip him to be able to assess traditional cures objectively.

Course Content:

Methods of obtaining information on medicinal plants. Screening plants for bioactive agents. Guidelines for research on medicinal plants for local drug production. Research trends on medicinal plants. Some common medicinal plants. Field trips within and outside the University campus to see some of the Nigerian Medicinal Plants**.**

COURSE CODE: **PCG 501**

COURSE TITLE: **Herbicides, Pesticides and Molluscicides**

UNITS|: **1 + 0 + 0; 0 + 0 + 0 = 1 unit**

Objectives:

At the end of the course, the student should have a working knowledge of available pesticides (which as a pharmacist, he may have to use); their chemical nature and mode of action. He would also be able to advice on the use of the appropriate pesticides used in cultivation and storage of plant drugs and their hazards to man.

Course Content:

Rodents, insect, snails as intermediates in disease dissemination. Public stakes in their control. Pest reduction, exclusion, eradication. Classification, chemistry, toxicology and used of synthetic and natural pesticides, Plants with insecticidal and molluscicidal properties. Hazards and precautions in their use. Laws extending to pest-control products.

Postgraduate Course Description

PCG 601: Phytochemistry of Natural Products (4 units)

Natural sources, biosynthesis, study of isolation, chemical properties and bioactivities of, alkaloids, isoprenoids (mono, sesqui-di, sester, tri-and tetra-terpenoids, caro-tenoids and sterols), cyanogenetics, coumarins, saponins, cardenolides, bufadienolides, anthraquinones, flavonoids and other groups**.**

PCG 602 Biological Variations in Natural Products (2 units)

Biovariation of secondary metabolic,. Genetic factors (chromosomes, mutation, polyploidy, hybridization, chemical races) regulatory mechanisms in biochemical systems. Effect of enzyme on chemical constituents and drug activity e.g. oxidoreductases of flavonoids, Opium, tea fermentation and hydrolases, cardiac and cyanogenetic glycosides.

PCG 603: **Application of Research Techniques in Pharmacognosy (6 units)**

Preparation of herbarium specimens. Use of flora keys for plant identification, microtome and advanced histological techniques as applied to pharmacognostical specimens, pharmacognostical drawings and photomicrography, quantitative, electron and phase contrast microscopy as applied to drug evaluation.

Application of spectroscopic methods (UR, IR, NMR, MS CD, ORD etc.) in structural elucidation, assessment of chemical purity, quantification, empirical studies and derivatization of chromatographic techniques (Adsorption, partition, GC, HPLC, Gel filtration, electrophoresis, ion-exchange separation etc.), extraction efficiency and pre-purification.

PCG 604: **Cultivation and Preparation of Crude Drugs (2 units)**

Historical development of cultivated plants. Drug plant propagation techniques, example from common drugs e.g. Digitalis, opium, ginger, cannabis, nutmeg, cinnamon (etc). factors affecting plant growth e.g. environmental factors, growth hormones and inhibitors etc. Phenotypic effects on variation during cultivation, tissue culture of medicinal plants. Possibilities and prospects of drug plant production in Nigeria, economic factors, genetic, consideration and selection in plant breeding. Study of the different factors affecting collection, Drying, and storage of crude drugs.

PCG 605: **Chemotaxonomy of Medical Plant (2 units)**

Introduction to classical plant taxonomy and chemotaxonomy of higher and lower plants. Distribution of certain chemotaxonomic group of constituents in plant kingdom.

Significance of biosynthetic pathways. Intra-specific variations, selection of chemotaxonomic markers to plant breeding. Application of chemotaxonomy to plant breeding.

PCG 606: Seminars on Current Topics in Pharmacognosy and Related Fields (2 units)

The objective of the Departmental seminar is to train graduate students how to search for, understand, write-up and orally present scientific information.

PCG 607: Field Trip (2 units)

Students will be required to make not less than three one-day field trips per semester as part of familiarization with medicinal plants in their habitat and to carry out practical exercises on use of flora keys for identification of medicinal plants after collection.

Use of micro-chemical kits for sampling and detection of plant constituents in vitro in the field. Use of methods sampling for ecological survey as appropriate for maximum yield of medicinal plant constituents.

List of Staff for Postgraduate Programme

Dr. (Mrs.) A. O. Adepiti B.Pharm, M.Sc., Ph.D. (Ife)	Senior Lecturer	Herb-drug interaction studies; evaluation of antimalarial plants
Prof. C. A. Adebajo B.Pharm, M.Phil, Ph.D. (Ife) M.P.S.N.	Professor	Phytochemistry, Biological Evaluation of Medicinal Plants.
Dr. S. A. Odediran B.Pharm, M.Sc., M.Phil, Ph.D. (Ife)	Senior Lecturer	Phytochemistry; combination studies of antimalarial plants
Dr. M. D. Ayoola B.Pharm, M.Sc., M.Phil, Ph.D. (Ife)	Senior Lecturer	Phytochemistry and Establishment of active constituents of ethnomedicinal anti-diabetic plants
Dr. (Mrs.) F. G. Famuyiwa B.Pharm, M.Sc., Ph.D. (Ife)	Lecturer I	Larvicidal Studies; Phytochemistry