# COURSES DESCRIPTIONS

| Herbal Drugs Macro- & Microscopical Analysis | |
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| **Course Code:** | **PHG 611** |
| **Credit hours:** | **1+1** |
| **Level/year at which this course is offered:** | **1st Level; 1st Year** |
| This course aims to provide students with the necessary information on the macroscopic and microscopic characteristics of the various parts of the plant, such as roots, leaves, flowers, and seeds. This course also includes a study on the classification of plants; with some practical applications and how to define the plant in the form of powder under the microscope, with a focus on the most widespread and commonly used plants in the Kingdom of Saudi Arabia such as Chamomile, Senna, Olive leaves, Black seed, Garden Cress and Costus. | |

| Phytomedicinal Products | |
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| **Course Code:** | **PHG 612** |
| **Credit hours:** | **1+0** |
| **Level/year at which this course is offered:** | **1st Level; 1st Year** |
| This course deals with the ingredients of the plants that used in treatments of various diseases. Origin of these Phytochemicals, chemical structures, quantitation and biological activities and usage area, dosages, side effects and contraindications. Taxol, Silymarin and Diosmin are examples of such compounds. | |

| Phytomedicinal Products Production, Collection and Isolation of Herbal Medicines | |
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| **Course Code:** | **PHG 613** |
| **Credit hours:** | **2+1** |
| **Level/year at which this course is offered:** | **1st Level; 1st Year** |

This course covers the different methods applied for the purification of natural products after extraction. Methods based on the physical characters such as boiling points, solubility or acid base characters will be presented.

As the chromatographic methods are the most efficient and applied method for natural products purification the principles and application of chromatography in natural products' purification and identification will be covered in detail.

Different techniques of chromatographic purification, including different types of column chromatography using positive and negative pressure, thin layer chromatography, and its various application in natural products.

Different types of stationary phases and the proper selection of their use based on the nature of the natural compounds will be covered.

The principles of qualitative and quantitative application of chromatography will be covered.

Pharmacopeial examples for the identification, analysis, purity confirmation, and detection of adulteration or exhaustion of drugs from the natural origin will be provided from the internationally recognized Pharmacopeias as well as from the World Health Organization (WHO) monographs of Herbal Drugs.

| Phytotherapy I | |
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| **Course Code:** | **PHG 614** |
| **Credit hours:** | **2+0** |
| **Level/year at which this course is offered:** | **1st Level; 1st Year** |
| This course aims to provide the students with knowledge about using phytotherapeutical drugs to manage various health problems. Learning and understanding the benefits and potentially dangerous situations of using phytotherapy in order to achieve the proper application of this therapy. Students who complete this course with the necessary studies can provide support and consulting services in this regard on a scientific basis. This course will deal with plants affecting the central nervous system, urinary system, respiratory system, digestive system diseases, and gynecology phytotherapeutics. | |

| Phytotherapy II | |
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| **Course Code:** | **PHG 621** |
| **Credit hours:** | **2+0** |
| **Level/year at which this course is offered:** | **2nd Level; 1st Year** |
| This course aims to provide the students with the knowledge about using medicinal plants and natural products in the management of disorders affecting the cardiovascular system, liver and biliary system, skin, obesity and the immune system. It includes the official names, synonyms, natural sources, bioactive components, mechanism of action, indications, proper dosing, available dosage in the market, precautions, adverse reactions, contraindications, herb-herb and herb-drug interactions, and toxicity. | |

## Quality Control of Phytopharmaceuticals

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| **Course Code:** | **PHG 622** |
| **Credit hours:** | **1+1** |
| **Level/year at which this course is offered:** | **2nd Level; 1st Year** |

This course aims to provide students with knowledge and experience about proper evaluation of medicinal herbal products according to pharmacopoeia standards.

Students will acquire knowledge about monographs and how to use them in the evaluation process. Examples of selected monograph analysis will be discussed based on the highly developed Pharmacopoeias such as American & European & British Pharmacopoeias and British Herbal Pharmacopeia.

All pharmacopeial experimental procedures including Physical and physicochemical examination, preparation of reagents, solvent used, extraction of the active ingredients of herbal drug, distillation methods, chromatographic methods, IR, UV, atomic absorption spectroscopic analysis will be discussed.

Saudi Food and Drug Administration (SFDA) regulations will be also covered.

Modern methods using integrated chromatography with spectroscopic tools such as HPTLC, HPLC-UV, HPLC-MS and GC-MS to develop fingerprinting chromatograms for proper identification of the chemical components and assure the absence of adulteration.

## Principles and Applications of Spectroscopic Techniques

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| **Course Code:** | **PHG 623** |
| **Credit hours:** | **2+1** |
| **Level/year at which this course is offered:** | **2nd Level; 1st Year** |

The course covers the application of different spectroscopic methods in the structure elucidation of different classes of natural compounds mainly obtained from plant sources. The following subjects will be covered:

The application of different electromagnetic radiations in the identification of natural products. The common function groups in natural products identification by Infra-Red will be demonstrated.

Application of Ultraviolet in the identification of flavonoids using various shift reagents will be discussed.

The students also will study the importance of low- and High-resolution Mass spectroscopy in natural products identification.

The role of different Nuclear Magnetic Resonance Spectroscopic methods in natural products identification will be provided including 1D and 2D NMR experiments.

The role of X-Ray and Optical Rotation in differentiating between the natural isomers that are very important in medical application will be emphasized.

Practical training and problem solving will be provided for the student to be able to use the data for natural compounds identification.

| **Herbal Drugs Licensing and Regulations** | |
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| **Course Code:** | **PHG 624** |
| **Credit hours:** | **1+0** |
| **Level/year at which this course is offered:** | **2nd Level; 1st Year** |
| The aim of this course is to acquire necessary information about Herbal Drug Licensing Regulations in Saudi Arabia and worldwide. The course includes legal definitions of the terms: herbal medicines, phytopharmaceutical and natural products, Standardization and Quality control. The course will also cover required documents and steps necessary for licensing of Herbal drugs and food supplements in relation to ESCOP (European Scientific Cooperative on Phytotherapy) and WHO (World Health Organization) monographs and regulations. Updated Royal orders of laws and regulations published in the official newspaper. | |

| Biological Evaluation of Natural Products | |
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| **Course Code:** | **PHG 631** |
| **Credit hours:** | **1+1** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |
| The aim of this course is to acquire necessary information about Herbal Drug Licensing Regulations in Saudi Arabia and worldwide. The course includes legal definitions of the terms: herbal medicines, phytopharmaceutical and natural products, Standardization and Quality control. The course will also cover required documents and steps necessary for licensing of Herbal drugs and food supplements in relation to ESCOP (European Scientific Cooperative on Phytotherapy) and WHO (World Health Organization) monographs and regulations. Updated Royal orders of laws and regulations published in the official newspaper. | |

| Seminar in Phytotherapy | |
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| **Course Code:** | **PHG 632** |
| **Credit hours:** | **1+0** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |
| Phytotherapy seminar is a round-table discussion on current topics of interest pertaining to phytotherapy and phytopharmaceuticals assessment. During this course, all registered students will give a one-hour presentation on an assigned topic and he must satisfactorily address any questions from the audience. Furthermore, all participating students should take part in a weekly journal club covering recent articles in the field of natural products. | |

| Toxicity and Safety of Herbal Medicine | |
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| **Course Code:** | **PHG 633** |
| **Credit hours:** | **1+0** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |
| The purpose of this course is to provide a background for addressing questions about the safety and toxicity of herbal products and to enhance communication skills of students in conveying reliable information to consumers and other health-care professionals. The course covers the toxicity of herbal products, influencing factors, toxic constituents, adverse effects and contraindications of most commonly used products, case studies, and protective measures. | |

## Elective courses

| Microbial Biotransformation and Tissue Culture | |
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| **Course Code:** | **PHG 634** |
| **Credit hours:** | **2+0** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |
| The course will provide participants with an overview of the different types of biotransformation (that deals specific modification of a definite compound to a distinct product with structural similarity) using natural and recombinant microorganisms, enzymes, whole cells. Types of chemical reactions carried out by microorganisms include oxidation, reduction, hydrolysis; decarboxylation etc. will be covered as Key areas in this course. By the end of the course participants will understand the importance of microbial transformation in improving efficacy and safety of active compounds. This course also covers the production and modification of biologically active important compounds using in vitro biological methods such as microorganism, plant and mammalian cell and tissue culture instead of chemical and synthetic techniques. | |

| Aromatherapy | |
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| **Course Code:** | **PHG 635** |
| **Credit hours:** | **2+0** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |
| The aim of this elective course is to give an overview of aromatherapy as a complementary and alternative therapy, which uses essential oils to promote both physical and psychological health. It covers the historical uses of essential oils and aromatherapy for healing, describes the methods of essential oil extraction and application, discusses the chemistry of essential oils and the essential components of some of the most popular essential aromatic healing oils, the clinical effects of essential oils using a body systems approach, the research on using aromatherapy for particular conditions, and the contraindications to using aromatherapy. It also involves quality control, storage and preservation of essential oils. | |

| Phytocosmeceuticals | |
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| **Course Code:** | **PHG 636** |
| **Credit hours:** | **2+0** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |
| The aim of the course is to enable the students to provide pharmaceutical services about phytocosmeceuticals after acquiring sufficient information. Students will have enough knowledge about What is Phytocosmeceuticals? What are the plants used in cosmetics? Methods of preparation and formulation of natural products used in Phytocosmetology. Various products used in Phytocosmeceuticals such as skin care, hair care, body care, sun protection, perfumery, antioxidants, anti-aging and weight loss will be addressed. These products also include some phytocosmeceuticals derived from marine organisms. For example, Abyssine is a skin product composed of exopolyssacharides marketed for soothing and reducing irritation of sensitive skin against chemical, mechanical and ultraviolet B (UVB) aggression. | |

| Alternative and Complementary Medicine | |
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| **Course Code:** | **PHG 637** |
| **Credit hours:** | **2+0** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |
| The course will provide knowledge about complementary and Alternative treatments and the difference between them. Some examples of Alternative treatment such as homeopathy and acupuncture will be addressed. The different schools of Traditional medicines such as Ayurveda, Chinese Medicine, Korean Medicine, Campo Medicine, Prophet Medicine, Arabic & Islamic Tradition Medicine will be studied from their origin to their recent application in our life today. | |

## Herb-Drug Interactions

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| **Course Code:** | **PHG 638** |
| **Credit hours:** | **2+0** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |

This course provides theoretical knowledge and skills about herb-drug or dietary supplements-food interactions and their clinical significance as well as the application of that knowledge to minimize the risk and outcome of interactions. The main aim of this course is to offer theoretical information about the interactions between herbal drugs and conventional drugs. The course will provide recent literature and case reports concerning the herb-drug interactions. It covers different types of drug interaction including herbal interactions, pharmacokinetic interactions, pharmacodynamics interactions, alcohol and smoking drug interactions, CNS drug interactions, interactions of cardiovascular acting drugs, interactions of anticoagulants, interactions of antimicrobials, interactions of hormones, and drug-disease interactions. Further, the responsibility of the pharmacist for avoiding these interactions will also be discussed in detail.

## Forensic Pharmacognosy

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| **Course Code:** | **PHG 639** |
| **Credit hours:** | **2+0** |
| **Level/year at which this course is offered:** | **3nd Level; 2nd year** |

The goal of this course is to give the student knowledge about the toxic plants and their active constituents that have been used for criminal activities, especially assassination, homicide and suicide attempts. The course also provides the student with knowledge regarding natural drug abuse and the analysis of their composition.