

■ ***Research Policy and Program***

Since 1996, UAP is the pioneer in launching four years Bachelor of Pharmacy (B. Pharm Hons.) program and one year Master of Science in Pharmaceutical Technology (MS. Pharm Tech) program. The Pharmacy department is one of the most progressive and established departments of the university as well as in the country. Following a bi-semester system, the Bachelor of Pharmacy requires minimum 8 semesters to prepare students as pharmacists and the Master of Science in Pharmaceutical Technology requires minimum 2 semesters to instruct and train the graduate pharmacists for working as integrated members of health-care system.



The areas of strength of the Pharmacy department are its twelve highly equipped teaching and research laboratories which are complete with up-to-date analytical instruments and machineries for evaluation of various dosage forms, design and manufacture of dosage forms, understanding of microbial disease pathogenesis and transmission, study of bio-chemical and biological studies of potential drug substance of natural origin.

Pharmaceutics and Pharmaceutical Technology Research

Pharmaceutics and Pharmaceutical Technology Research Group is conducting the study of different validation methods, different drug delivery systems (like microsphere, pellets, biodegradable implants, self emulsifying drug delivery system-SEDDS, solid dispersion-SD, bilayer drug delivery system, liposomes and noisome drug delivery system), different dosage form like tablet, minitab, bilayer tablet, compressible capsule etc., drug formulation, basic quality evaluations of raw, intermediate and finished products, drug delivery, drug release kinetics, protein binding of drugs, mixture design of dosage form and observation of polymeric interaction, crystallization and nano-crystallization, Dissolution and solubility enhancement of poorly soluble drugs by solid dispersion and using hydrophilic carrier, Biphasic oral solid drug delivery, Liquisolid technique, Self-emulsifying drug delivery and controlled release dosage form technology.

Pharmacology and Biotechnology Research

Biotechnology research lab is one of the most sophisticated labs in the Department of Pharmacy where plasmid DNA isolation, protein synthesis, PCR technology and polymorphism of different genes and other biotechnology related research works are performed.



Phytochemistry and Natural Products Research

This group works to explore the potential of medicinal plants of folklore medicinal uses. Notable research includes the isolation of bioactive molecule, evaluation of analgesic and anti-inflammatory, anthelmintic, antibacterial and antifungal, anticancer, antidiabetic, antidiarrhoeal, diuretic, hepatoprotective, and thrombolytic activity among others. Quantitative analysis of antioxidative components like total amount of phenolics, flavonoids and flavonols are estimated using spectrophotometric method.

Microbiology Research

Microbiology lab focuses on the isolation and purification of causative agents of different diseases along with the determination of resistance pattern of different microorganisms against antibiotics.

Biotechnology Research Lab

Biotechnology Research Lab offers the facilities for performing basic and common biotechnology laboratory techniques. It provides hands on experience in the areas of laboratory safety, aseptic techniques, measurements, calculations, preparation of solutions, use of pH meters, spectrophotometers, centrifuges, etc., as well as training in specific biotechnology techniques, including DNA extraction and amplification, Agarose gel electrophoresis and restriction digestion of DNA. It has a Laminar air Flow Cabinet (ESCO) for preparation of biological samples, solutions and reaction mixtures to prevent contamination. For safety and preservation of temperature sensitive reagents and human bloods, Ultra Low Refrigerator (-80°C) (Witeg), Refrigerator (-32°C) (Simens)

and Normal Refrigerator (Sharp) are used. Vortex Mixture (Digisystem), Mini Shaker (IKA), Metabolic Shaker (ZHICHENE) and Micro centrifuge (Hermles) are available in the laboratory for separation and mixing of biological samples and reaction mixtures.

For the purpose of DNA amplification, a PCR machine from ESCO Healthcare is provided by which 24 samples can be run at once. The laboratory grants two Electrophoresis Gel Systems (Biometra) for performing Agarose Gel Electrophoresis. For gel imaging and analysis, we have a sophisticated Gel Documentation System supplied from Syngene. In addition, incubation of PCR products for restriction digestion can be done by using temperature and duration controlled -Heating Block. We also have a Nano spectrophotometer (Genova Nano) for measuring the concentration and the purity of DNA samples with great precision and accuracy. Besides, the laboratory is equipped with an Electronic Balance, an Autoclave and a Binocular microscope. The laboratory follows all the regulations governing biological laboratories that dictate the safety procedures and protocols for disposal of hazardous chemicals and biological.

Research & Development Formulation Lab

Research & Development Formulation Lab is used for conducting four separate Labs which housed in a single room at 4th floor of UAP City Campus (411). This lab is well equipped with mixture machine, double cone blender, drum mixture, coating pan, compressor, bottle dryer, tablet compress machine (single punch and 8 punch). Each laboratory experiment is designed to provide students the knowledge of basic tablet compression, tablet blending, mixing and drying.

Research and Development Analysis Laboratory

Research and Development Analysis Lab is located at 4th floor (R-409) of the UAP City Campus (R-411). It is designed by epoxy floor, sandwich panel wall, double door entrance-exit and has dehumidifier with HVAC system Pharmaceutical analysis

principally deals with analysis of pharmaceutical products. Our laboratory is devoted to the developmental analysis of different drugs, stability testing, determination of impurities, etc. The complex tasks of pharmaceutical development may also include development of new pharmacopoeial methods, stress testing to validate stability-indicating methods, impurity analysis and identification, herbal material analysis, cleaning validations, degradation tests and stability studies. We are specifically interested in: method development and validation, analysis of marketed pharmaceutical products as well as analysis of prepared dosage forms in the pharmaceutical technology lab. The techniques used are High performance Liquid Chromatography (HPLC), Automatic Titrator and Fourier-transform infrared spectroscopy (FTIR).

Pharmaceutical Technology Research Lab

Pharmaceutical Technology Research Lab, dedicated to thesis students of Master's program focused on pharmaceutical technology, is accommodated in 4th floor (R-408) of UAP city campus. This exclusive lab is furnished with varied equipments like air compressor machine, coating pan, die punch, dissolution tester, electronic analytical balance, fume cupboard, hot plate, magnetic stirrer, digital over head stirrer, sieve shaker, oven, pH meter, ultrasonicator, vortex mixer, water bath and UV-Spectrophotometer. Adequate numbers of glassware and chemical reagents are made available for untroubled conduction of researches on conventional as well as advanced drug delivery system such as micro and nano particles, solid dispersion, SEEDS, Liposomes etc. This Lab enables students to experience with the formulation development and characterization of the developed formulations using various techniques during their thesis in Master's program.

B Pharm Project laboratory

B Pharm Project laboratory is located at 4th floor of the UAP City Campus(R-410). This laboratory is equipped with sufficient machineries and PCs to conduct different types of project works of 4th year students. Adequate numbers of equipment e.g. tablet

dissolution and disintegration tester, friability tester, HPLC water purification systems, moisture analyzer and UV spectrophotometer have been used by the undergraduate students for their B. Pharm. project works which mainly comprised of different tablet evaluation tests. In this laboratory, six students can run six different projects at a time.