Graduate Opportunites for Pharmacy Students

KAGAN

ATIKELER

"Perhaps no other job in pharmacy has such far-reaching effects on the profession as that of an educator. It is in academia that one can excite individuals about pharmacy and lay the groundwork for continuing advances in the field.

- Current member at College of Pharmacy Perdue University

Being Scientist

Pharmacy practice faculty have significant responsibility for patient care, in addition to their work in teaching and research. These academicians often are called educator/ practitioners, and they serve as role models for pharmacy students and residents in many education/practice settings. Faculty in disciplines other than pharmacy practice usually are involved in pharmaceutical sciences research. The pharmaceutical scientists are mainly concerned with research that includes sophisticated instrumentation, analytical methods, and animal models that study all aspects of drugs and drug products. Moreover, social, economic, and behavioral science research often uses survey methods and statistical analyses to solve complex problems of drug utilization management, health care delivery, marketing, management, and other practice issues. To paraphrase one current pharmacy faculty member [6]

General Information of Graduate Programs

Graduate programmes are carried out by Science Institutes. Researches held in the Faculty mainly depend on both basic and applied knowledge related to pharmaceutical sciences and health care systems as in other countries. Research areas are diversified and cover mainly the areas of such as biological activities of natural products and medicinal plant extracts and phytochemical studies on them, pharmaceutical product development and quality assesments, structure and activity relations, new drug delivery systems and their applications, biotechnological products, analytical toxicology and pharmacology, pharmacokinetic and bioavailability of new drugs.

Pharmaceutical Technology Graduate Programs

Pharmaceutical Technology graduate programs consist of Master of Science and Doctorate programs. Main aims of these programs are: in the direction of obtained developments about medicines and pharmacy, to train (educate) expert personnel who have sufficient knowledge and ability to work in universities, public associations about health, drug industry and related sectors (R&D, production, quality control, quality assurance, legislation etc.) Moreover, the students graduated from the field of Pharmaceutical Technology can take responsibility in universities as academic staff who have Master of Science or Doctorate degrees. Main goal of our programs is to educate researchers and academics who follow the latest literature work around the globe, have sufficient information about scientific developments and can create innovation, can compete with their knowledge in a global manner. Graduates can take responsibility and duty in universities, drug industry (R&D, Legislation and Marketing Departments) public associations[5]

Pharmaceutical Biotechnology Graduate Program

Pharmaceutical Biotechnology is the science that covers all technologies required for the production, manufacturing and registration of biological drugs. Advances in recombinant genetics facilitate the routine cloning of genes and the creation of genetically modified organisms that can be used in industrial production. Pharmaceutical Biotechnology is a rapidly evolving and multidisciplinary field and Pharmaceutical Biotechnology program focus on the new developments in the production of proteins, organisms, DNA-based vaccines, therapeutic proteins, downstream processing and characterisation, bioinformatics, advanced molecular principles, and research methods.

Pharmaceutical Biotechnology Graduate Program

Pharmaceutical Biotechnology Graduate program will produce graduates with a critical and analytical capability and a flexible approach to problem solving. These skills will enhance your laboratory and professional competence at a supervisory level and you will be able to work independently and use your initiative to solve the diverse problems you may encounter. You will also be able to bring a creative approach to the development and promotion of new biotechnology products. Biotechnology is developing rapidly; there is a major emphasis on product- and process-oriented biotechnological research and development for applications in agriculture, industry and the health sector. These applications will bring benefits for society and are increasingly recognised by governments, industry and financial institutions. The program will help to address the expanding demand from international markets for graduates with an excellent knowledge of biotechnology.

Biopharmaceutics Graduate Program

Biopharmaceuticals provides pharmacists and other chemical and life science graduates with scientific knowledge and expertise in the areas of biopharmaceutical discovery and development required for a career in the pharmaceutical and biopharmaceutical industry, research institutes or regulatory authorities. [12]

Pharmacology Graduate Program

Pharmacology is the study of drugs that interact with living systems. In the pharmacological studies, it is aimed to determine the most appropriate chemical substance which will be used in the diagnosis and prophylaxis of diseases, and for other medical purposes. These studies include in vitro and in vivo experiments on animals and humans. This program aims to educate researches who have sufficient background in Pharmacology and ability to work in several fields such as Faculty of Pharmacy, Faculty of Medicine, or Faculty of Dentistry, hospitals, and drug industry.

Graduates can find an opportunity to do research and work in several fields such as Faculty of Pharmacy, Faculty of Medicine, or Faculty of Dentistry, hospitals, and drug industry as a Pharmacologist in all over the world

Pharmacognosy Master and Ph.D. Program

Pharmacognosy Graduate Programs consist of Master and Ph.D. programs. Content, design and time course of the programs are complementary to each other. Both programs are an original research education which takes place under supervision. Pharmacognosy department has a strong and established research background. The graduate students are learnt natural sources and natural products, their microscopic and chemical analysis, chemical composition, structure-activity relationships, usage, effects of the drug and lead compound discovery from natural source.[7]

Pharmaceutical Chemistry Graduate Programs

Pharmaceutical Chemistry Graduate Program mainly focused on investigation and identification of drugs and their structures, investigating the structure-activity relationships of the formerly synthesized drugs whose activities had been confirmed, synthesis of novel drugs based on the molecular structures of these drugs.

Biochemistry Graduate Program

Biochemistry PhD Program aims candidates; to understand the theoretical knowledge in biochemistry and related fields, gain technical skills in laboratory manipulations and ability to access the knowledge, plan and carry out experiment, solve problems, interpret experimental data, present a work through oral, written and visual presentations, gain the ability to develop new strategies in biochemistry and evaluate the results as part of quality management, acquire ethical issues in science and career, and equipped so as to meet the demands of biochemistry related sectors.

Analytical Chemistry Graduate Program

Department of Analytical Chemistry educates the expert graduates who have ethical values and playing an active role in pharmacy, pharmaceutical industry and research activities. The graduates can apply and develop the classical and modern analysis methods and techniques in analytical chemistry.

Graduates can continue their academic studies in all relevant sections of universities.In addition, graduates can find an opportunity work in several fields such as particularly in the pharmaceutical industry, all the industrial enterprises and research and development centers.

Pharmaceutical Botany Graduate Program

Research areas are identification of medicinal plants which are important in pharmacy and drug industry to obtain herbal drugs as well as toxic and hazardous plants. Determination, scientific identification of herbal resources used in traditional medicine and documentation of ethnobotanical information. Morphological and anatomical investigation on medicinal plants, excursion and herbarium studies, taxonomic and floristic studies. Conservation of rich floras from all over world and cultivation and standardization of medicinal and aromatic plants. Qualitative and quantitative analysis and biological activities of plant extracts. Plant cell and tissue culture and plant molecular biology, botanical analysis in pharmacopoeias and monographs..

Pharmacy Administration

The mission of the Department of Pharmacy Administration is to foster an educational, research, and service program of global preeminence through organizational excellence, diversity, innovation, and collaboration. Pharmacy Administration is a dynamic field that applies approaches from management sciences, economics, and the social sciences, to issues in healthcare that relate to pharmacy, pharmacists, and pharmaceuticals.

Pharmacy Administration

Research in Pharmacy Administration may be theoretical or applied and is often interdisciplinary in nature, encouraging collaboration across fields, including: communications, decision and information sciences, economics, education, law, management, marketing, medicine, psychology, public health, public policy, sociology, and urban planning. The Department of Pharmacy Administration provides opportunities for advanced study and research in the social, behavioral, and administrative sciences and in pharmaceutical education. Our research is facilitated through strong relationships with government agencies, managed care organizations, pharmacy benefit managers, pharmaceutical manufacturers, and national and international university-based researchers.

Researches of Pharmacy Administration

- *Pharmacy health services research* – evaluation of economic, epidemiological, humanistic and clinical outcomes of healthcare interventions; evaluation of quality of care; pharmacist-patient communications; safe medication use and systems; and workforce studies;
- *Pharmacy health policy* – organizational behavior, pharmacy management, socioeconomic and cultural issues related to medication use; and,
- *Pharmacy education* – instructional methods and evaluation.

Pharmacy Management

- **Industry**
- Management
- Research Development
- Product Management
- Marketing Management

Pharmacy Management

- **Government Bases Drug Management**
- National Drug Policy
- Drug Logistics Management
- Development and Assessment of Reimbursement Systems
- Drug Pricing Policy 4
-

Master of Health Economics

This program provides graduate training in all aspects of health economics, meeting the clear need for comprehensive programs internationally. This program is designed for people intending to work in the health sector. This program is accessible to those with undergraduate qualifications in economics or other disciplines. The program offers students the opportunity to develop strong analytical skills and is a qualification which may further career opportunities in national and international health agencies.

This highly specialised program provides critical insight into the complex economic issues in health sector administration, and the economic impacts of decisions. Students may take elective courses in analytical techniques, including advanced applied econometrics, public economics, health finance, epidemiology, business and economic decision techniques, burden of disease methods, benefit-cost analysis and health and economic development [2]

Master of Science in Applied Health Economics and Outcomes Research

Applied Health Economics and Outcomes Research (AHEOR) is an academic discipline that focuses on whether or not a product or service is efficacious and benefits patients. It establishes efficacy of the product or service, then compares its effectiveness to other interventions, and finally considers its incremental cost efficiency. AHEOR is increasingly important and necessary as rising health care costs continue to challenge the stability of the nation's economy. Costs continue to rise despite evidence that additional spending is not associated with attractive incremental value in outcomes, costs or quality.

Master of Science in Applied Health Economics and Outcomes Research

The Master of Science in Applied Health Economics and Outcomes Research (MS-AHEOR) meets the growing need for professionals to evaluate and measure health outcomes (both physical and humanistic) and to ascertain economic consequences of health care interventions by determining optimal clinical effectiveness, comparative effectiveness, and economic value.

Program Goal

Graduates of the MS-AHEOR will design, conduct, analyze, and critically interpret findings from economic evaluations of healthcare interventions. Graduates will be in a position to become national leaders in applied health economics and influence decision making regarding the allocation of health care resources using established scientific methods.

Programe Objectives

- Analyze the structure and function of the healthcare institutions, with strong emphasis on financing and delivery characteristics
- Apply analytic methods – including burden of illness analyses, evidence evaluations, research designs, statistical considerations, cost and financial impact analyses, cost-effectiveness analyses, decision analyses, and other clinical and economic evaluation techniques – to inform resource allocation, relative value assessments and policy initiatives
- Interpret and apply organizing and conceptual frameworks used in applied health economic analysis, such as utility, quality of life, game theory, behavioral economics, and diffusion of innovation
- Interpret and apply organizing and conceptual frameworks used in AHEOR output, such as economic metrics (e.g. cost-consequences, cost-effectiveness, cost-utility), quality of life evaluations (e.g. utilities and patient reported outcomes), and healthcare technology assessment evaluations (e.g. budget impact analysis, guidelines, formularies, positive and negative lists)
- Communicate policy options and ramifications to various stakeholders by framing AHEOR concepts and techniques in terms relevant to decision makers and their ability to disseminate value information in their work environment
- Assume leadership roles in the decision process regarding the allocation of healthcare resources [1]

Program
Combined Pharm.D./Graduate Degree

Graduate degrees in Pharmacoeconomics and Health Outcomes are designed to prepare students for pharmacy career opportunities in industry, government, and academia. It focuses on the study of economic, social, and administrative problems in pharmacy. Previous graduates from this and other Pharmacoeconomics Programs typically take non-traditional career paths working in the Pharmaceutical Industry, Government, Professional Associations, Health Care Systems, Managed Care, Consulting, and Academia.

Educational Options in Pharmacoeconomics and Health Outcomes

Students can enroll in either the Masters of Science or Ph.D. programs. Enrollment into the program can either be after graduation from a professional pharmacy degree or other similar program or as part of the combined Pharm.D./Graduate program. From now on I will focus on the post graduation option.

Post Graduate Options

A Masters of Science (M.S.) degree in Pharmacoeconomics and Health Outcomes is a graduate degree designed to provide advanced study within a specialized area of pharmacy. Students develop the ability to study drug use problems in-depth and design strategies to solve them. These problems can cover a wide range of topics including clinical, managerial, and practice related issues. Students develop a broad range of skills by taking graduate classes and working closely with clinical and pharmacoeconomics faculty. Students demonstrate their mastery of these skills by completing a major research project called a thesis. The thesis can be about interesting questions in pharmacy practice, pharmacoeconomics, pharmacoepidemiology, clinical practice, and marketing.

Ph.D. Degree

- The Ph.D. Degree in Pharmacoeconomics and Health Outcomes is a research degree that is the highest educational degree possible. It trains students to answer complex research questions and develop high levels of research and analysis capabilities. Like the M.S. program, students can study in a broad range of areas relating to pharmacoeconomics and health outcomes.
- Unlike the M.S. program, however, students complete more complex research. This education prepares individuals for career opportunities at the highest levels of government, academia, consulting, and industry. Career opportunities with this degree are global.

Who Should Consider the Graduate Program in Pharmacoeconomics and Health Outcomes?

A graduate degree in Pharmacoeconomics and Health Outcomes may be appropriate for students who:

- Wish to differentiate themselves from others
- Are dissatisfied with traditional career opportunities
- Want to pursue nontraditional career opportunities
- Have a desire to learn and explore new ideas
- Desire intellectual stimulation and challenge.

Program Goals

- To give students a greater understanding of problems and issues in Pharmacy.
- To teach students to apply research principles and problem solving skills to clinical and practice related problems.
- To provide a series of practical research experiences that permit a student to develop skills and knowledge that will be of value to employers.
- To participate in scholarly research in collaboration with pharmacists and other health care professionals.
- To prepare graduates for a variety of career opportunities in settings such as managed health care, institutional pharmacy practice, the pharmaceutical industry, government, and academia.

Program Description

This Program prepares graduates to apply methods from clinical, managerial, economic, and social sciences to problems associated with the distribution and use of pharmaceutical products and the provision of pharmacy services. Students can specialize in a broad array of disciplines that permit them to develop a theoretical foundation with which to approach these problems.

Some Possible Areas Of Specialization

Pharmacoeconomics

Pharmacoepidemiology

Marketing

Management

Sociology

Education

Gerontology

Health Care Policy

Health Informatics

Health Services Research

Program Description

Methods from these disciplines are incorporated with knowledge from the pharmaceutical sciences to provide a unique perspective when addressing problems that impact the use of pharmaceuticals.

The following are a small sample of questions that might be of interest to people in the discipline of Social and Administrative Sciences;

- Which drug is most cost effective for a population of patients suffering from a given condition or disease?
- What is the distribution of adverse drug events across the United States?
- What are the consequences of direct-to-consumer advertising on prescription drug prescribing and utilization?
- How can pharmaceutical prescribing and distribution systems be improved to reduce medication prescribing, dispensing, and administration errors ?

Program Description

- How can pharmacists help patients to better adhere to their prescribed medication regimen?
- Why do patients choose alternative medicines and what benefits do they receive?
- How can professionalism best be instilled in pharmacy students?
- How can Internet and other technologies be used to increase access and quality of pharmacy services?
- What are the consequences and costs of the Medicare prescription drug benefit?

End of the All… There is something behind the career

- Anyway do not forget that ; studying graduate program and becoming scientist does not mean that you have to be in academia or you can only be in academia, we need scientist brains on every area.

After all those information I should leave some time for social life

References

1- Jefferson University, http://www.jefferson.edu/population_health/academic_programs/ahe.html , Last Access: 17.05.2013

2- The University of Queensland, http://www.uq.edu.au/study/program.html?acad_prog=5418, Last Access : 17.05.2013

3- Ankara University Faculty of Pharmacy, http://sagbilens.ankara.edu.tr/en/AnaBilimDallari-Department-of--Pharmaceutical-Management-4.html , Last Access : 17.05.2013

4- Hacettepe University Faculty of Pharmacy, http://www.pharmacy.hacettepe.edu.tr/index.php?option=com_content&view=article&id=93%3Aeczaclk-letmecilii-anabilim-dal-aratrma-konular&catid=19&Itemid=10, Last Access : 17.05.2013

5- University of Hacettepe , Health Sciences Institute , http://www.healthsci.hacettepe.edu.tr/pharmatech.html , Last Access : 17.05.2013

6- College of Pharmacy Purdue, http://www.pharmacy.purdue.edu/students/prospective/CareerOpts.php, Last Access : 17.05.2013

7- University of Hacettepe , Health Sciences Institute , http://www.healthsci.hacettepe.edu.tr/farmakognazi.html, Last Access: 17.05.2013

8- University of Hacettepe , Health Sciences Institute , http://www.healthsci.hacettepe.edu.tr/botanik.html, Last Access: 17.05.2013

9- Rahime Simsek Prof., European Research Centre for Drug Discovery and Development, http://www.natsyndrugs.org/w2d3/v3/view/natsyndrugs2/istituti--12/index_en.html, Last Access: 17.05.2013

10- University of Greenwich, http://www2.gre.ac.uk/study/courses/pg/sci/pb, Last Access : 17.05.2013

11- University of Mersin, http://oibs.mersin.edu.tr/bologna/?id=/programme&degree=10&program=665 , Last Access 17.05.2013

12- University of Illinous College of Pharmacy , http://www.uic.edu/pharmacy/depts/Biopharmaceutical_Sciences/graduate_programs/phd.php , Last Access 17.05.2013

13- University of VCU , http://www.pharmacy.vcu.edu/pharmacy/page.aspx?id=58 , Last Access 17.05.2013

Thank you for patience !