Doctor of Pharmacy (Pharm. D.)

(6 Years Post Graduation with Prefix Doctor before your name)

Importance, Scope and Placements in India & Abroad

About Course

- **Pharm.D. course is introduced by Govt. of India and Pharmacy Council of India, New Delhi in 2008**
- It was introduced with a vision for improvement of clinical pharmacy services in our country.
- It is the only pharmacy service which is in direct contact with patient health care system.
- The Pharm.D. program is a pre-Ph.D., post-graduate professional doctorate.
- **After obtaining Pharm.D. degree, the candidate can put Dr. (Doctor) before his/her name.**
- **Duration: 06 years, divided in two phases:**
  Phase-I (05 Years Study) and
  Phase-II (01 Year Internship/ Residency)
- **Examination pattern:** Annual
- **Eligibility:** Pass in 10+2 Science (Medical/ Non-Medical) or D.Pharmacy, eligible to get admission in first year of this course.
- **In countries like USA, Australia, Canada etc., this course has central and pivotal role in the health care system.**
- The course aims to prepare eligible candidates students in the management of patient medication therapy and improving patient outcomes.

SCOPE & PLACEMENTS

Pharm.D. candidates may work in the following fields:

- **Scientist for Clinical Trials:** A new drug undergoes various clinical trials on humans under the expertise of pharmacologists.

- **Pharmacovigilance Scientist/Officer:** Various companies like Quantum, Herron etc. recruit pharmacologists for the vigilance of various drugs used in the public domain for their new adverse drug effects or new indications etc.

- Clinical Research Organizations like Parexel, Herron etc.
- Research fellow in various research projects of government and private agencies.
- Research & Development process of new drug molecules.
- Indian Pharmacopoeia Commission Recruitment
- Product Management Officers
- Medical Trainers
- Executives in Pharma Regulatory Affairs
- Community/Clinical Pharmacist
- Consultant Pharmacist
- Prescription Audits
- Drug Use Surveys
- Medical Advisors
- **Also play a key role in production, testing, quality control, quality assurance and marketing of pharmaceuticals.**
- **Academics: Undergraduate and postgraduate teaching**
- **Pharm.D has not been limited to above scope but it also has special role in various domains like:**
  - Pharmacoeconomics and Pharmacoepidemiology,
  - Chronopharmacology,
  - pharmacogenomics &
  - Pharmacogenetics

Job Opportunities Abroad

- ✓ Hospital/Clinical Pharmacist
- ✓ Community Pharmacist
- ✓ Phamacist Assistant
- ✓ Pharmacy Technician
- ✓ Patient Counsellor

- ✓ Analytical Chemist
- ✓ Drug Store Management
- ✓ Clinical Research
- ✓ Pharmacovigilance
- ✓ Drug Information Pharmacist
- ✓ Ambulatory Pharmacist
- ✓ Paediatric Care Pharmacist
- ✓ E-Prescription Pharmacist
- ✓ E-Pharmacy Pharmacist
- ✓ Medical Coding
- ✓ Special Care Pharmacist

Master of Pharmacy (Pharmacology)

(02 Years Post-Graduation Course)

Importance, Scope and Placements

About Course

M.Pharmacy (Pharmacology) is a post-graduate course of pharmaceutical sciences in Pharmacology specialization.

***Pharmacology* is the science of drugs.**

It is a branch of science that deals with the effects of drugs on living organisms and fate of the drug in the living system i.e. Pharmacodynamics & Pharmacokinetics.

Eligibility: Bachelor of Pharmacy

Duration: 04 Semesters

Examination Pattern: Semester

Scope and Placements in India and Abroad

- **Pharmacologists play a central and pivotal role in health care system as well as in new drug discovery process.**
- **R & D Scientist for Preclinical Studies: A newly discovered drug molecule is tested in experimental pharmacology laboratory for in-vitro & in-vivo studies in rat, mice, guinea pig etc. and then in higher animals like primates for preclinical studies by the pharmacologists.**
- **Scientist for New Drug Development**: In random screening, rational drug designing or prodrug concept
- **Scientist for Clinical Trials: A new drug undergoes various clinical trials on humans under the expertise of pharmacologists.**
- **Scientist for Toxicological studies**
- **Research fellow in various projects of central and state agencies.**
- **Pharmacovigilance Scientist/Officer: Various companies like Quantum, Herron etc. recruit pharmacologists for the vigilance of various drugs used in the public domain for their new adverse drug effects or new indications etc.**
- **Pharmacologists play a key role in testing & production of drugs**
- **Academician**
- **Clinical Pharmacist**

- **Prescription Audits**
- **Drug Use Surveys**
- Medical Advisor
- Product Management
- Trainer for medical professionals
- **Pharmacologists also have special role in various domains like**

  Pharmacoeconomics
  Pharmacoepidemiology
  Chronopharmacology
  Pharmacogenomics & Pharmacogenetics &Many more……...

Other career prospects

"Pharmacy is the branch of health sciences that deals with the preparation and dispensing of drugs. Its aim is to ensure the safe and effective use of pharmaceutical drugs".

MPHARMACY PHARMACEUTICS (Importance)

M.Pharm. Pharmaceutics is a full-time 2-year long postgraduate course the eligibility for which is a graduation degree in B.Pharm. program with a minimum of 50% marks from any recognized university or any other institute equivalent to university.

The syllabus for the course is divided into 4 semesters of 6 months each.

The said course will educate the candidates about:-

- The design and manufacture of medicines
- Expertise candidates with strong analytical skills and provide knowledge for modern techniques of manufacturing medicines
- Recent developments in drug delivery system as one of its subjects.
- At the end of the course, the last two semesters will comprise of a dissertation, presentation, and viva voce which will test their practical along with their theoretical skills.
- Besides that, the presentation and communication skills are very important when the candidate will be expected to sell their manufactured medicines to pharmaceutical companies.

CAREER SCOPE/JOB OPPORTUNITIES/PLACEMENTS

Career Scope & Job Opportunities in Pharmacy field are huge. Due to the opening of large pharmaceutical companies, the future in the field of pharmacy is bright. After completing

M. Pharmacy, you can seek employment in government, private or multinational organisations.

Placement in India

M.Pharm Government Jobs:

The jobs which can be found by an M.Pharm graduate in the public sector are enlisted below:

- Research Analyst
- Drug Controller
- Pharmacist
- Pharmaceutical Research Associate
- Medical Representative
- Medical Coder
- Professor
- Production Manager

M.Pharm Private Jobs:

Various job opportunities are available for M.Pharm course graduates in the private sector. The jobs which can be found are listed below:

- Drug Therapist
- Pharmacist
- Medical Representative
- Drug Analyst
- Medical Coder
- Drug Controller
- Production Manager
- Research Scientist

Placement abroad

- The Pharmacy Examining Board of Canada, PEBC conducts PHARMACIST Qualifying Examination and provides Certification of Qualification.

<table>
<tr><td>M.S</td><td>M.B.A (Pharma)</td><td rowspan="6">PHD AND POST DOC RESEARCH WORK IN VARIOUS Universities and Organizations</td></tr>
<tr><td>GRE-USA</td><td>GMAT</td></tr>
<tr><td>TOEFL-USA, UK</td><td>TOEFL-USA, UK</td></tr>
<tr><td></td><td></td></tr>
<tr><td>IELTS-AUS,CANADA,UK, NEW ZEALAND</td><td>IELTS-AUS,CANADA UK,NZ</td></tr>
<tr><td colspan="2">Work as registered Pharmacist in Middle East and in Gulf</td></tr>
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Importance of M. Pharmacy (Pharmacognosy)

Pharmacognosy is the study of medicines derived from natural sources, and the interactions that occur between a living organism and chemicals that affect normal or abnormal biochemical function. Substances having medicinal properties are considered pharmaceuticals.

M. Pharm. Pharmacognosy and Phytochemistry or Master of Pharmacy in Pharmacognosy and Phytochemistry is a postgraduate Pharmacy course. The course covers all the aspects of the two fields pharmacognosy and phytochemistry. Pharmacognosy plays a major role in the herbal drug industry. It entails the development of new analytical methods using sophisticated instruments like HPLC, FTIR and HPTLC to check the quality and quantity of crude drugs and their finished formulation. Pharmacognosy deals with phytochemical tests and the manufacturing and analysis of herbal drugs, which have a wider scope in the R&D department of the pharma industry. Phytochemistry is the study of phytochemicals which are chemicals derived from plants. Many of these are known to provide protection against insect attacks and plant diseases. The programme covers subjects like DRA & IPR, Modern Analytical Techniques (UV, IR, NMR, MASS, HPLC etc), Pharmaceutical Biostatistics & Computer applications, which makes the programme unique in its kind.

Qualified and trained Pharmacognists serve as medical practitioners in the Indian system of medicines. Government of India appoints doctors for the Indian system of Medicines under the aegis of AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy).

Career opportunities available in India after M. Pharm (Pharmacognosy)

- ✓ Researcher
- ✓ Regulatory Manager
- ✓ Data Manager
- ✓ Lecturer & Professor (Government & Private)
- ✓ Medical Transcriptionist
- ✓ Analytical Chemist
- ✓ Drug Inspector
- ✓ Health Care Unit Manager
- ✓ Retailing Supervisor
- ✓ Publisher & Columnist
- ✓ R & D
- ✓ Research Officer
- ✓ Natural Product Scientist

- ✓ Higher Education (PhD)
- ✓ Pharmacovigilance Scientist
- ✓ Forrest Department Scientist

Career opportunities available in Abroad after M. Pharm (Pharmacognosy)

- ✓ Higher Education (PhD)
- ✓ Clinical Research
- ✓ Production Manager in Herbal Industry
- ✓ Quality Control Supervisor
- ✓ Lecturer & Professor (Government & Private)
- ✓ Natural Product Scientist
- ✓ Pharmacovigilance Scientist
- ✓ Supervisor in Forest Department

THE SCOPE OF PHARMACOGNOSY

The pharmacognosy has played important role in the development of various departments of the science. Pharmacognosy gives a sound knowledge of the vegetable drugs under botany and animal drugs under zoology.

It also includes plant taxonomy, plant breeding, plant pathology, and plant genetics and by this knowledge one can improve the cultivation methods for both medicinal and aromatic plants.

Nowadays photochemistry (plant chemistry) has undergone the significant improvement. This includes a variety of substances that are accumulated by plants and synthesized by plants.

A VITAL CONTRIBUTION TO THE ADVANCEMENT OF NATURAL AND PHYSICAL SCIENCE

This has done by the advanced technologies of cultivation,

purification, identification (characterization) ofpharmaceuticals from nature.

- Concepts of biochemistry and chemical engineering help in the improvement of collection, processing and storage technologies of pharmaceuticals.

- It also gives knowledge of chemotaxonomy, biogenic pathways for the formation of acute ingredients.

A VITAL LINK BETWEEN PHARMACOGNOSY AND MEDICINAL CHEMISTRY

- ewly detected plant drugs are converting into medicine as purified phytochemicals. Pharmacognosy is essential for the evolution of new medicines because crude drugs are used for the preparation of galanicals or as sources of therapeutically active metabolites.

- hytopharmaceuticals that is synthesized drugs are finally formed in a suitable dosage forms and in which the crude drugs can be act as intermediates.

A VITAL LINK BETWEEN PHARMACOGNOSY AND PHARMACEUTICS

- n short pharmacognosy is an important link between pharmaceuticals and basic science as well as ayurvedic and allopathic system of medicines. So pharmacognosy is a science of active principles of crude drugs and which can help in dispensing, formulating, and manufacturing of dosage forms.

n other way the complete knowledge of pharmacognosy will help in the recent trend that is in industries, as a research tools and in new drug delivery systems, and all the departments of pharmaceuticals and one can improve the healthcare facilities across the world.

A VITAL LINK BETWEEN PHARMACOGNOSY AND PHARMACOLOGY

- Pharmacognosy without pharmacology or toxicology is a branch of basic science that will be very similar to botany.

- It is dealing with effects of active material on biological materials as tissue or body. I mean you cannot exclude effect of chemical synthesis compounds from organic chemistry to the pharmacology.

- Both natural medicinal plants and chemical synthesis compounds have direct relation to pharmacology. Therefore, pharmaceutical biology will be narrow expression or a branch of pharmacology.

Master of Science (Mathematics)

Importance, Scope and Placements in India & Abroad

Mathematics offers a huge variety of career opportunities. It is important to plan ahead and know about your options.

Importance-An MSc in Mathematics gives students who want to work in science, engineering, or computing a solid core education. Most degree programs also require a research component, so students can get a feel for how to use their new skills in the real world.

Scope - MSc Mathematics graduates have a much higher job scope compared to other post-graduates. They can find lot of opportunities in Research and Development firms, Economic Research firms, Market Research firms and Manufacturing firms. They can look for the job profiles like Quantitative Risk Analyst, Statistician, Treasury Management Specialist and Demographer in these firms. Those who want to work in public sector can find opportunities in various government organizations like Defense Research and Development Organization (DRDO) and Indian Space Research Organization (ISRO). Reputed Software companies offer several career opportunities for these graduates in operation research, software design and programming. Banks and Insurance companies also offer lucrative opportunities for the candidates who have completed their postgraduate degree in Mathematics. They can also work in various government colleges after qualifying SET or NET exam. After MSc Mathematics students who wish to continue studying can choose to do PhD in Mathematics that helps them to become a researcher in the field of mathematics.

MSc Mathematics Jobs Abroad:

MSc Mathematics graduates have pretty high profile jobs in abroad than compared to India. Even they get paid a handsome salary in abroad because of the value of mathematicians over there. Some of the job profiles in abroad are mentioned below:

Chief Economist

Mathematician

Professor

Statistician

Accountant

Meteorologist

Chief Engineer

Master of Science (Chemistry)

Importance, Scope and Placements in India & Abroad

A person who is Master of Science in chemistry acquires professional as well as scientific level of competency.

Career prospectus and scope after M.Sc. in chemistry are very vast. They can look for jobs in Pharma companies, laboratories, research centres, medical colleges, private clinics etc.

Aspirants of M.Sc. chemistry are entitled to pursue their career in broad spectrum of sectors entitled to:

- Synthetic lab assistant
- Assistant professor
- Online tutor
- Solid state chemistry expert
- Research officer
- Application specialist – Analytical chemistry
- Research scientist
- Quality control chemist
- Chemist
- Senior research associates
- Quality assurance
- Research manager

Competitive exams after M.Sc. chemistry

- CTET – Centre Teacher Eligibility Test
- HTET – Haryana Teacher Eligibility Test
- NET – National Eligibility Test
- SRF – Senior Research Fellowship
- Banking examination
- Civil services examination

Scope of higher studies after M.Sc. chemistry

- They can join various other post-graduation and research courses related to topic of interest
- After M.Sc. chemistry students can join doctor of philosophy to pursue or enhance the career in research as well as teaching after PhD and candidate can further go for post doctorate fellowship