1. What is pharmaceutical science?
   - Pharmaceutical science belongs to a branch of science that comprises a range of scientific subjects dealing with various aspects of discovery, development, formulation, manufacturing as well as the quality assurance of pharmaceutical substances that are used to manufacture the medicinal products.
   - Therefore, pharmaceutical science forms the foundational scientific basis of the physical, chemical, biological and the biomedical aspects of drug properties and actions.
   - Some examples of subjects that are classified under pharmaceutical science include Medicinal Chemistry, Pharmaceutics, Pharmaceutical Technology, Pharmaceutical Analysis, Pharmacokinetics, Pharmaceutical Biotechnology, Pharmacoeconomics and Pharmacogenetics.
   - Advancements achieved in pharmaceutical science will impact drug discovery, drug formulation as well as the regulation and practice of pharmacy.

2. What is the role of pharmaceutical scientists?
   - A pharmaceutical scientist is a qualified expert in aspects of the science and technology of medicinal products.
   - This includes, but is not limited to, the discovery, development, manufacture, regulation, and utilisation of medical products.
   - Pharmaceutical scientists focus on how medicines work, how safe and effective products are brought to the market, their impact on the body and their effect on the prevention and treatment of disease.
   - Pharmaceutical scientists are hence equipped with specialised skills for jobs related in research and development, manufacturing, regulatory affairs, medical affairs, clinical trial management, quality control and assurance, sales and marketing, and entrepreneurship.

3. What is the difference between pharmacy and pharmaceutical science?
   - Pharmacy involves the study of drug substances, medicinal products and the use of medicines in patients to achieve optimal therapeutic outcomes.
   - While there are some foundational pharmaceutical sciences covered in the NUS Pharmacy programme, this programme is chiefly clinical in nature and leads to a professional healthcare degree and pharmacist licensing to support the handling and transactions of medications.
   - As licensed holders of medication, pharmacists will be well-trained to advance patient-focused, medicine-centred healthcare practices.
   - This focus is in contrast to that of pharmaceutical scientists, who work towards the discovery, development, testing, manufacturing and understanding of the market and regulatory access of medicines.
   - The NUS Pharmaceutical Science programme will cover a broad range of these disciplines in greater depth, but will not delve into clinical practice and does not lead to licensing like a pharmacist.

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**The Pharmaceutical Scientist:**
- Discover, develop and manufacture drugs
- Understand market and regulatory access for drugs
- Greater focus on pharmaceutical sciences
- Greater flexibility in curriculum for double majors, minors, etc.

**BSc Major in Pharmaceutical Science**

*Science degree leading to a career in various pharmaceutical industries and businesses*

**The Pharmacist:**
- Dispense medicines and provide advice to patients
- Manage patient’s medication requirements
- Greater focus on medication use and clinical knowledge
- Professional degree leading to pre-registration training for a Pharmacist License

**BSc Major in Pharmacy**

*Professional degree leading to a career in healthcare institutes and some pharmaceutical industries*
4. **What are the pre-requisites for admission into Pharmaceutical Science?**
   - Very good passes in Chemistry (H2) and in either Biology (H2) or Physics (H2) or Mathematics (H2) or Further Mathematics (H2) taken at GCE ‘A’ Level (or equivalent).
   - For further information on application, please go to [http://www.nus.edu.sg/oam](http://www.nus.edu.sg/oam) and read the relevant application procedures for the respective groups of applicants.

5. **Is it possible to enter the Pharmaceutical Science programme without ‘A’ Level biology?**
   - Yes. ‘A’ Level biology (H2) (or the equivalent) is not a compulsory subject pre-requisite for application to the Pharmaceutical Science programme in NUS.
   - However, ‘A’ Level chemistry (H2) (or the equivalent) remains as the only compulsory prerequisite subject for entry to the NUS Pharmaceutical Science programme.

6. **What is the course duration?**
   - The Pharmaceutical Science course is a four-year degree programme.
   - Students are admitted directly into the Pharmaceutical Science programme in the first year of study.
   - At the end of the four years, graduates are conferred the degree of B.Sc. in Pharmaceutical Science, while those who have demonstrated good academic performance over the four years will be awarded the B.Sc. (Hons) in Pharmaceutical Science degree.

7. **What is the overall course structure like?**
   - The four-year direct honours degree course will feature a mixture of traditional lectures, tutorials and practicals, with blended as well as experiential learning.
   - Students will undertake core modules in foundational sciences (e.g. anatomy, physiology, biochemistry, pharmacology) before covering the full spectrum of pharmaceutical sciences (e.g. drug discovery and development).
   - In the 3rd and 4th years, students are free to choose elective modules in more specialised areas of study (e.g. medicinal natural products, special drug delivery, applied pharmacokinetics and toxicokinetics).
   - The curriculum also provides flexibility to pursue a broad-based education to explore other interests, such as taking up double majors or minor programmes, e.g. Minor in Forensic Science, Business or Analytical Chemistry.
   - The programme culminates in an individual Honours project in the final year with supervision by our department faculty members or industry partners. This will allow students to explore interesting and novel scientific or real-world issues and gain invaluable research experience.
   - During the four-year programme, students may concurrently participate in other academic programmes offered by the University or Faculty, e.g. University Scholar Programme, University Town College Programme, NUS Overseas College Programme, as well as student exchange programmes etc.

8. **What are the various opportunities that a pharmaceutical science undergraduate can expect, i.e., leadership building, research opportunities etc.?**
   - There are abundant opportunities for undergraduate students to hone their talents and soft skills in NUS Pharmacy.
   - **NUS Pharmaceutical Society (NUSPS),** a student-led organisation, comprises several sub-committees (e.g. media resource team, international relations) that work closely together with the mission to engage and empower the student body. Students can be part of NUSPS by serving in the committees and in the process, develop inter-personal, leadership and networking skills amongst many others.
   - Students can also participate in other special activities/projects e.g. Pharmacy Youth Expedition Project (YEP), or spend a year at one of the NUS Overseas Colleges (NOC), or participate in overseas exchange programmes. These experiences will definitely broaden their horizons.
   - Students who are interested in embarking on a research career can participate in Undergraduate Research Projects in Science (UROPS) under close supervision by experienced Pharmacy faculty members. These research opportunities are open to the students as early as their 2nd year in the Pharmaceutical Science programme.
   - In their final year, all students will undertake a compulsory final year research project. Students may have the opportunity to showcase and present their research work in local or even international conferences.

9. **What are the career prospects for pharmaceutical science graduates?**
   - Graduates from this degree programme will be well-equipped to take up a wide variety of career choices in pharmaceutical industries and businesses.
Depending on their interests and capabilities, graduates can explore jobs in research and development, manufacturing operations, sales and marketing, regulatory affairs, quality management, pharmaceutical supply chain logistics, and clinical trial management.

By taking up a Second Major in Business, or Minor in Management or Entrepreneurship, we also envision our graduates will acquire grounding in commercial knowledge to be the nation’s next generation of pharmaceutical and healthcare entrepreneurs.

The more entrepreneurial graduates have also set up their own business ventures.

10. Will pharmaceutical science graduates be able to switch to a totally different career path should they decide to do so upon graduation?

- Yes, graduates from NUS Pharmaceutical Science will be exposed to a rigorous academic programme that prepares an individual for self-directed and lifelong learning to adapt to alternative career paths.
- The curriculum is designed to produce future-ready, well-rounded graduates with skill sets and knowledge that may also be useful in vocations that are not directly related to pharmaceutical science.
- However, the Pharmaceutical Science programme does NOT lead to licensure and you will not be able to register or practise as a pharmacist. Consequently, a small number of industry jobs (e.g. regulatory) may still require employees to hold the pharmacist’s license and these jobs will only be available for licensed pharmacists.
- For students interested in pursuing a career as a healthcare professional, they should consider applying for the B.Sc. Pharmacy programme.

11. Should I apply for the B.Sc. in Pharmaceutical Science or the Minor in Pharmaceutical Science?

- The B.Sc. programme covers a greater depth and breadth of knowledge compared to the Minor programme.
- Minor students only read six pharmaceutical science modules to be acquainted with some fundamental knowledge and relevant skill sets. This will allow Minor students to become more aware of how their domain knowledge from their respective Major programmes could be applied in the pharmaceutical industry.
- On the other hand, B.Sc. in Pharmaceutical Science programme students will be trained in a wide range of pharmaceutical sciences with greater breadth and depth. This will equip graduates to embark on diverse careers in the pharmaceutical industries.
- Major students will also have opportunities to embark on exclusive overseas and internship opportunities that are not available for Minor students.
- Moreover, students from the B.Sc. Pharmaceutical Science programme will also be members of NUSPS, our student society, where there are opportunities to take part or even organise various student-led activities, ranging from freshman orientation projects to welfare events. These experiences will give students a holistic university education with a vibrant university life.

12. How many students are accepted each year?

- In the inaugural batch that started in Academic Year 2018/2019, we admitted approximately 30 students into the programme. We anticipate a similar number in the near future.