



## Courses at A Glance

Students taking the Second Major in Pharmaceutical Engineering will read the following courses:

- Materials and Energy Balance
- Heat and Mass Transfer
- Chemical Reaction Engineering
- Unit Operation
- Process Control and Dynamics
- Bioseparations
- Pharmacokinetics and Biopharmaceutics
- Chemical and Biomolecular Engineering Laboratory
- Special Topics in Biotechnology
- Bioanalytical Techniques
- Formulation of Active Pharmaceutical Ingredients Dosage Forms

## Admission Requirements

Candidates must meet the minimum entry requirements of the principal Engineering programme. These minimum subject requirements include:

- H2 Level pass in Mathematics or equivalent, and
- H2 Level pass in Chemistry, and
- H1 Level/'O' Level pass in Physics<sup>1</sup> or equivalent

<sup>1</sup>H1 Level/'O' Level pass in Physics is only applicable to candidates who have not read Physics at H2 Level.



## Tuition Fees And Scholarships

The tuition fees for the Bachelor of Engineering with a Second Major in Pharmaceutical Engineering programme will be pegged to the fees for the chosen Bachelor of Engineering programmes. Eligible students may be considered for scholarships that include fully subsidised tuition fees and living allowance. Scholarship terms and conditions apply. For more information on tuition fees and scholarships, please visit <http://admissions.ntu.edu.sg>.

## Graduation

Graduates of the Bachelor of Engineering with a Second Major in Pharmaceutical Engineering will be awarded a Bachelor in Engineering in their chosen Engineering major with an additional certificate for the Second Major in Pharmaceutical Engineering.



## Careers

The Bachelor of Engineering with a Second Major in Pharmaceutical Engineering degree offers graduates the versatility to embark on a wide range of careers in the pharmaceutical and biomedical industry as well as relevant industries, both locally and abroad.

### ORGANISATIONS

- Pharmaceuticals and biotechnology firms
- Research institutes
- National laboratories
- Corporate laboratories
- Hospitals and healthcare services
- National specialty centres

### POSSIBLE CAREER PATHS

- Engineering
- Biopharmaceutical development and manufacturing
- Research and development
- Commercialisation
- Quality and process development
- Regulatory sciences
- Analytics

### Accreditation

All Bachelor of Engineering programmes offered by Nanyang Technological University's College of Engineering are accredited by The Institution of Engineers Singapore, the Singapore signatory to the Washington Accord, through its Engineering Accreditation Board. The Washington Accord is an international agreement for mutual recognition of substantial equivalence of engineering academic programmes worldwide as satisfying the academic requirements for the practice of engineering at a professional level.

### Information And Enquiries

For more information and enquiries on the Bachelor of Engineering with a Second Major in Pharmaceutical Engineering programme, please visit <http://coe.ntu.edu.sg/PE>.



# BACHELOR OF ENGINEERING WITH A SECOND MAJOR IN PHARMACEUTICAL ENGINEERING



# Bachelor of Engineering With A Second Major in Pharmaceutical Engineering



“...more than 30 of the world's leading pharmaceutical companies have made Singapore their global manufacturing base.”

Singapore has positioned itself as a strong biopharmaceutical manufacturing hub since the early 2000s. Today, Singapore is a top manufacturing site for active pharmaceutical ingredients and solid dosage drugs for the global market. Drawn by Singapore's competitive advantages in world-class infrastructure and capabilities, scientific and clinical excellence, robust regulatory framework and intellectual property protection, as well as global standards in safety, quality and efficacy, more than 30 of the world's leading biopharmaceutical companies have made Singapore their global

manufacturing base. These companies have invested significantly in new biologics manufacturing sites in Singapore, driving an increase in demand for biopharma engineers and related research innovations. The new Second Major in Pharmaceutical Engineering will prepare students for exciting and impactful careers in the vital pharmaceutical industries spanning key sectors such as pharmaceutical and biotechnology, biomedical and clinical sciences, healthcare and research and development.

## Programme Options

The Bachelor of Engineering with a Second Major in Pharmaceutical Engineering programme integrates the requirements of both engineering majors within the typical candidature of 4 years. Students can choose from 2 programme options.

### Bioengineering with a Second Major in Pharmaceutical Engineering

Bioengineering is a multidisciplinary programme with a core curriculum focusing on integral aspects of biomolecular and pharmaceutical engineering processes, such as protein engineering, biomolecular detection using innovative sensing devices and bioprocess quality assurance employing advanced bioimaging techniques.

Integrated with the Second Major in Pharmaceutical Engineering, students in this unique programme will receive in-depth training in the development and manufacturing of pharmaceutical drugs to produce high value and high quality biological-based therapeutics.

### Materials Engineering with a Second Major in Pharmaceutical Engineering

Materials Engineering is a multifaceted science-driven and application-oriented engineering programme that focuses on the innovation of revolutionary novel materials for the development of cutting-edge technologies and solutions. With core strengths in fundamental materials science and materials design, the programme harnesses its tremendous synergy with the Second Major in Pharmaceutical

Engineering to train students in biomaterials, drug delivery, tissue engineering and other pharmaceutical-related subjects. Graduates of the programme can look forward to working at the nexus of pharmaceutical engineering and materials engineering to create innovative new therapeutics and formulations.



#### Programme Enquiries

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