NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Chemistry, Chemical Engineering and Biotechnology
College of Engineering • College of Science

Master of Science in

CHEMICAL SCIENCES & INSTRUMENTATION

The **Master of Science in Chemical Sciences and Instrumentation** programme is targeted at professionals looking to maximise their potential in the energy and chemicals industry, as well as recent graduates seeking headstarts in their careers.

The Master of Science programme equips graduates with transferable and interdisciplinary skills in chemistry concepts, instruments, data science and technopreneurship.

CURRICULUM OVERVIEW

Chemistry is known as the central science that bridges the physical sciences with other disciplines, including medicine and engineering, especially in growing fields such as sustainable energy, electric vehicles, urban farming, 3D printing and nanotechnology. Chemical Sciences and Instrumentation encompasses all the theoretical and applied aspects of chemistry, which are vital for success in the energy and chemicals sector.

In 2019, the International Council of Chemical Associations released a report that estimated the chemical industry's contribution to the global gross domestic product (GDP) was around US$5.7 trillion (~ 7%) and it also supported around 120 million jobs worldwide.

In Singapore, the energy and chemicals sector forms part of the essential services critical to the global supply chain and contributes to around S$81 billion or 1/3 of Singapore's total manufacturing output, with an extra S$12.7 billion more expected by 2025 in the Energy and Chemicals Industry Transformation Map from the Ministry of Trade and Industry.

The curriculum includes advanced theoretical courses in the sub-disciplines of chemistry, hands-on exposure to some of the latest equipment, as well as training in commercialisation, data analytics and communication. The complementary depth and breadth of the programme will provide holistic education that should help graduates adapt and thrive in a knowledge-based economy.

Intensive one -year full-time (or two-year part-time)

Includes advanced theoretical courses in the sub-disciplines of chemistry and hands-on exposure to some of the latest equipment

Provides holistic education that should help graduates adapt and thrive in a knowledge-based economy

Interdisciplinary skills in chemistry concepts, instruments, data science and technopreneurship

COURSE LIST

COMPULSORY COURSES		AUs
CM6800	Graduate Seminar	4
CM6801	Academic Communication (Chemistry)	0
CM6810	Advanced Chemical Instrumentation	2
CM6890	Research for M.Sc. I	6
TP6202	Technology Commercialisation	3

PRESCRIBED ELECTIVE COURSES
Synthesis and Life Sciences Specialisation

CM6820	Graduate Basic and Technical Inorganic Chemistry	2
CM6832	Drug Discovery and Development	4
CM6850	Graduate Chemical Biology	4

PRESCRIBED ELECTIVE COURSES
Analytical and Nanotechnology Specialisation

CM6840	Advanced Analytical and Spectroscopic Methods in Materials Chemistry	2
CM6841	Advanced Synthetic and Physical Approaches to Materials Chemistry	2
CM6842	Applications of Artificial Intelligence in the Chemical Sciences	3
CM6860	Advanced Nanoscience and Nanotechnology	3

UNRESTRICTED ELECTIVE COURSES (Choose at least 5 AUs)		AUs
CM6811	Advanced Techniques for Structural Determination	3
CM6812	Analytical Chemistry in Industry	2
CM6831	Graduate Life Science Organic Chemistry	2
CM6843	Computational Chemistry for Molecular Modelling	2
CM6844	Scientific Computing with Python	2
CM6861	Advanced Topics in Environmental Sciences and Sustainable Development	3
CM6862	Advanced Analytical & Manufacturing Techniques in Pharmaceutical Industry	3
CM6865	Graduate Internship	3
CM6891	Research for M.Sc. II	3

Notes:
The programme consists of 30 Academic Units (AUs), with 15 AUs of compulsory modules, 10 AUs from the chosen specialisation's electives and 5 AUs from unrestricted electives.

The requirements for graduation are:

- Successful completion of all requirements as prescribed by the programme of study; and
- Attainment of a minimum CGPA of 2.50 at the completion of the study programme.

ADMISSION REQUIREMENTS

A good Bachelor's Degree in a relevant programme, e.g. Chemistry, Materials Science, Chemical Engineering, etc.

A good TOEFL or IELTS score for graduates of universities where English is not the medium of instruction.

A minimum of two years of relevant working experience is preferred but not required.

A good GRE or GMAT score is preferred but not required.

FOR MORE INFORMATION

Contact Us

For general enquiries, email mscsi@ntu.edu.sg.
For academic enquiries, email the Programme Director, Associate Professor Soo Han Sen, hansen@ntu.edu.sg

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