Degree Requirements of MSc (Chemical Engineering)

(for cohorts from Semester 1, AY2020/2021 to Semester 1, AY2023/2024)

The graduation requirements include obtaining a minimum Grade Point Average (GPA) of 3.0 (equivalent to an average of Grade B-) for the best 40 units. Of the 40 units, at least 32 units must be from Group 1 list of courses. The remaining units may be from Group 1, Group 2 or any courses from the graduate levels in the same or other disciplines as approved by the Department.

Courses in Group 1 are in several specialised areas of chemical engineering while those in Group 2 consist of selected courses from other Master of Science programmes in the College of Design and Engineering.

Group 1

CN5010	Mathematical & Computing Methods for Chemical Engineers
CN5020	Advanced Reaction Engineering
CN5030	Advanced Chemical Engineering Thermodynamics
CN5040	Advanced Transport Phenomena
CN5050	Advanced Separation Processes
CN5111	Optimization of Chemical Processes[#+]
CN5111B	Process Optimization with Industrial Applications
CN5112	Introduction to Electrochemical Systems
CN5124	Fluid-Particle Systems[#]
CN5131	Colloids and Surfaces
CN5150	Principles of Polymer Science and Engineering
CN5160	Advanced Topics in Catalysis
CN5161	Polymer Processing Engineering
CN5162	Advanced Polymeric Materials
CN5172	Biochemical Engineering[#]
CN5173	Downstream Processing of Biochemical & Pharmaceutical Products[#]
CN5181	Computer Aided Chemical Engineering[+]
CN5190	Hydrogen Energy and Technology[#^]
CN5191	Project Engineering[#^+]
CN5192	Future Fuel Options: Prospects and Technologies[^]
CN5193	Instrumental Methods of Analysis
CN5194	Carbon Capture Sequestration and Utilization[^+]
CN5195	Biomass and Energy[^]
CN5203	Circular Economy in the Chemical Industry[#]
CN5204	Green Chemical Process and Technology[#]
CN5205	Advanced Machine Learning for Chemical Engineers[+]
CN5206	Advanced Fluid Mechanics with Artificial Intelligence[#^]
CN5207	Energy Transition Towards Net Zero[#^]
CN5208	Nuclear Reactor Engineering[#]
CN5215	Atomistic Modelling of Molecules and Materials[#+]
CN5216	Electronic Materials and Energy Technologies[#^+]
CN5219	Engineering Nanobiotechnology
CN5220	Colloids and Soft Matter Engineering
CN5222	Pharmaceuticals and Fine Chemicals[#]
CN5240	Principles and Applications of Battery Technologies[^] *– coming in Sem 2, AY2026/2027*
CN5246	Catalysis Science and Engineering[#^]
CN5247	Advanced Enzyme Technology *– coming in Sem 2, AY2026/2027*
CN5251	Membrane Science and Technology[#]
CN5252	Molecular and Computational Tools for Biotechnology
CN5277	Molecular Engineering of Advanced Drug Delivery Systems[#]
CN5301	Sustainability Strategies for Energy Systems[^+]
CN5304	Process Systems Analysis and Decision-Making[^+] *– coming in Sem 2, AY2026/2027*
CN5371	Special Topics in Biochemical Engineering and Bioseparations
CN5391	Selected Topics in Advanced Chemical Engineering – I

CN5392	Selected Topics in Advanced Chemical Engineering – II
CN5401	Contemporary Topics in Advanced Chemical Engineering (2 units)
CN5432	Fundamentals and Applications of Porous Materials
CN5555	Chemical Engineering Project[+] (8 units)
CN5566	Chemical Engineering Industrial Practice[+] (8 units)

Group 2

ESE5202	Air Pollution Control Technology
ESE5602	Environmental Management Systems
MT5912	Frugal Innovation
MT5913	TechLaunch – Experiential Entrepreneurship
MT5920	Enterprise Development - Experiential Innovation
SH5201	Process Hazard Analysis
SH5202	Quantified Risk Analysis
SH5204	Industrial Safety Engineering

Note: All courses listed are worth 4 units each except for CN5401 Contemporary Topics in Advanced Chemical Engineering (2 units), CN5555 Chemical Engineering Project (8 units) and CN5566 Chemical Engineering Industrial Practice (8 units).

** Not all courses listed above are necessarily available in any one year, and new courses may be made available from time to time.*

[#] *Courses that are also offered to BEng (Chem Eng) undergraduate students*

[^] *Courses that are also offered to MSc (Energy Systems) students*

[+] *100% Continuous Assessment; no final exam*