

**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 <sup>#+</sup>                                                |
| CN5111B | Process Optimization with Industrial Applications                                               |
| CN5112  | Introduction to Electrochemical Systems                                                         |
| CN5124  | Fluid-Particle Systems <sup>#</sup>                                                             |
| 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 <sup>#</sup>                                                            |
| CN5173  | Downstream Processing of Biochemical & Pharmaceutical Products <sup>#</sup>                     |
| CN5181  | Computer Aided Chemical Engineering <sup>+</sup>                                                |
| CN5190  | Hydrogen Energy and Technology <sup>#^</sup>                                                    |
| CN5191  | Project Engineering <sup>#^+</sup>                                                              |
| CN5192  | Future Fuel Options: Prospects and Technologies <sup>^</sup>                                    |
| CN5193  | Instrumental Methods of Analysis                                                                |
| CN5194  | Carbon Capture Sequestration and Utilization <sup>^</sup>                                       |
| CN5195  | Biomass and Energy <sup>^</sup>                                                                 |
| CN5203  | Circular Economy in the Chemical Industry <sup>#</sup>                                          |
| CN5204  | Green Chemical Process and Technology <sup>#</sup>                                              |
| CN5205  | Advanced Machine Learning for Chemical Engineers <sup>+</sup>                                   |
| CN5206  | Advanced Fluid Mechanics with Artificial Intelligence <sup>#^</sup>                             |
| CN5207  | Energy Transition Towards Net Zero <sup>#^</sup>                                                |
| CN5215  | Atomistic Modelling of Molecules and Materials <sup>#+</sup>                                    |
| CN5216  | Electronic Materials and Energy Technologies <sup>#^+</sup>                                     |
| CN5219  | Engineering Nanobiotechnology                                                                   |
| CN5220  | Colloids and Soft Matter Engineering                                                            |
| CN5222  | Pharmaceuticals and Fine Chemicals <sup>#</sup>                                                 |
| CN5240  | Principles and Applications of Battery Technologies <sup>^</sup> – coming in Sem 2, AY2026/2027 |
| CN5246  | Catalysis Science and Engineering <sup>#^</sup>                                                 |
| CN5251  | Membrane Science and Technology <sup>#</sup>                                                    |
| CN5252  | Molecular and Computational Tools for Biotechnology                                             |
| CN5277  | Molecular Engineering of Advanced Drug Delivery Systems <sup>#</sup>                            |
| CN5301  | Sustainability Strategies for Energy Systems <sup>^</sup>                                       |
| 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 <sup>+</sup> (8 units)             |
| CN5566 | Chemical Engineering Industrial Practice <sup>+</sup> (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.*

<sup>#</sup> Courses that are also offered to BEng (Chem Eng) undergraduate students

<sup>^</sup> Courses that are also offered to MSc (Energy Systems) students

<sup>+</sup> 100% Continuous Assessment; no final exam