Chemical Engineering and AI (Option G)

September 2024 (students who entered first year in September 2023 or later)

### Year 2

#### Term A
- **NMM 2270A**: Applied Mathematics for Engineering II
- **AISE 2205A**: Algorithms and Data Structures
- **CBE 2290A**: Fundamentals of Biochemical and Environmental Eng.
- **CBE 2206A**: Industrial Organic Chemistry I
- **CBE 2214A**: Engineering Thermodynamics
- **CBE 2220A**: Chemical Process Calculations

#### Term B
- **NMM 2277B**: Applied Mathematics for Chem & Civil Eng. III
- **AISE 2251B**: Software Design for Systems Engineering
- **SS 2143B**: Applied Statistics and Data Analysis for Engineers
- **CBE 2207B**: Industrial Organic Chemistry II
- **CBE 2221B**: Fluid Flow
- **CBE 2224B**: Chemical Engineering Thermodynamics

### Year 3

#### Term A
- **DS 3000A**: Intro to Machine Learning
- **AISE 3309A**: Database Systems
- **AISE 3350A**: Cyber-Physical Systems Theory
- **CBE 3315A**: Reaction Engineering
- **CBE 3322A**: Heat Transfer Operations
- One 0.5-credit non-technical elective

#### Term B
- **AISE 3010B**: Data Engineering and Machine Learning
- **AISE 3351B**: Digital Systems and Signal Processing
- **CBE 2291B**: Computational Methods in Chemical Engineering
- **CBE 3323B**: Staged Operations
- **CBE 3324B**: Mass Transfer Operations
- **Writing**: Building Better (Communication) Bridges: Rhetoric and 2130F/G
- **Professional Communications for Engineers**

### Year 4

#### Term A
- **AISE 4010A**: Deep Learning for Time Series Data
- **AISE 4430A**: Introduction to Computer Networking, Security & IOT Systems
- **CBE 3307A**: Energy and Environment
- **CBE 3318A**: Introduction to Chemical Process Simulation
- **CBE 3395Y**: Chemical Engineering Lab
- One 0.5-credit non-technical elective* (can be in term A or B)

#### Term B
- **AISE 4020B**: Artificial Intelligence Systems Engineering Design
- **CBE 3310B**: Process Dynamics and Control
- **CBE 3316B**: Sustainable Chemical Eng and Life Cycle Analysis
- **CBE 3319B**: Introduction to Plant Design and Safety
- **CBE 3395Y**: Chemical Engineering Lab
- 0.5 credit from AISE technical electives (can be in term A or B)**

### NOTES:

**Important:**
Students are responsible for ensuring they have the correct courses required for their degree. If you are unsure which courses you still need or if you see courses listed on the progression sheet that are no longer offered or are not offered in the term you see listed here, please contact your Academic Counsellor.

*Non-technical Electives:
Please choose a maximum of 1.0 credits (one 1.0 credit course or two 0.5 credit courses) from the 1000 level and a minimum of one 0.5 credit from the 2000 (or higher) level.

http://www.eng.uwo.ca/undergraduate/upper_year/electives.html

**Technical Electives:**
- **AISE technical electives**
  - refer to a list of AI-based technical courses approved by the AISE program committee. The list consists of AI-based courses offered by the Faculty of Engineering and Faculty of Science at Western. The list will be updated every year.

Some technical electives may not be offered in a given academic year. Consult the Department for accurate listing.

<table>
<thead>
<tr>
<th>CBE Technical Electives</th>
<th><strong>AISE Technical Electives</strong></th>
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<tbody>
<tr>
<td>CBE 4404A/B Downstream Processing in Pharmaceutical Manufacturing</td>
<td>ECE 4445A/B Introduction to Digital Image Processing</td>
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<tr>
<td>CBE 4405A/B Air Pollution</td>
<td>ECE 4438A/B Advanced Image Processing and Analysis</td>
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<tr>
<td>CBE 4407A/B Solid Waste Treatment</td>
<td>CBE 4428A/B Introduction to Nanoengineering</td>
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<tr>
<td>CBE 4409A/B Wastewater Treatment</td>
<td>CBE 4432A/B Energy and Fuels Production Systems</td>
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<td>CBE 4411A/B Engineering Coffee</td>
<td>CBE 4463A/B Water Pollution Design</td>
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<td>CBE 4413A/B Selected Topic in Chemical Engineering</td>
<td>CBE 445A/B Energy &amp; Society</td>
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<td>CBE 4415 Chemical Engineering Project</td>
<td>CBE 4493A/B Polymer Engineering</td>
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<td>CBE 4416A/B Carbon Footprint &amp; Management</td>
<td>CEE 3362A/B Drinking Water Quality and Treatment</td>
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<td>CBE 4417A/B Catalytic Processes</td>
<td>CBE 4484A/B Process on Green Fuels and Chemicals</td>
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<tr>
<td>CBE 4418A/B Industrial Multiphase Reactor Design</td>
<td>MME 4429A/B Nuclear Engineering</td>
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<td>CBE 4420A/B Computer Process Control</td>
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The official version of the academic calendar can be found at: [www.westerncalendar.uwo.ca](http://www.westerncalendar.uwo.ca)
## Year 5

### Term A
- AISE 4050  
  Artificial Intelligence Systems Engineering Design
- AISE 4450A  
  Data Driven Control of Cyber-Physical Systems
- AISE 3020A  
  AI: Ethics, Bias and Privacy
- ELI 4110F  
  Engineering Ethics, Sustainability Development and the Law

One 0.5 credit non-technical elective (can be in term A or B)**

### Term B
- AISE 4050  
  Artificial Intelligence Systems Engineering Design

One 0.5 credit from AISE technical elective (can be in term A or B)**

Two 0.5 credits CBE Technical Elective