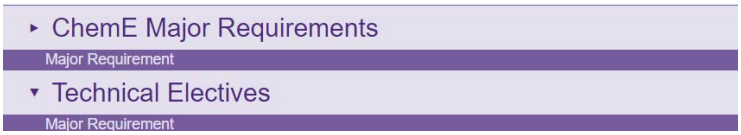
Northwestern | McCORMICK SCHOOL OF ENGINEERING
Data Science and Engineering

# Guidance for Chemical Engineering Majors

- The guidance here is based on the 2020 ChemE degree requirements. You can find Data Science & Engineering (DSE) Minor curriculum details on the DSE website.

- The DSE Minor requires 8 courses. McCormick requires that each minor consist of 5 courses that are **not** used towards any of your major requirements.
  - "Major Requirements" are those designated as "Major Program (16 units)" in the catalog. They are also designated with purple banners in your MAS degree audit:




  - You can count up to 3 courses towards both DSE minor and your major requirements.
  - Talk to your advisor, or to Prof. Cole, about how to choose DSE electives that can be used towards your Technical electives.
  - Basic Engineering and Unrestricted Electives are not considered major requirements.

- Double counting rules also apply to minors and certificates.
  - This means your DSE minor must use 5 courses that do not apply to your major program, or to any other minors and certificates.
  - Take advantage of flexibility in some of the minor requirements.
    *Example: if you have credit for both COMP_SCI 150 and COMP_SCI 211, you can use either of them to fulfill the programming foundations requirement.*

- Be mindful of prerequisites, both for DSE Core Courses and for DSE Electives. Declaration of the minor does not imply that any prerequisites will be waived for you.

*The guides below represent some possible paths for ChemE majors who are pursuing the DSE minor. Other paths are possible—talk to your advisor or email us at dse@northwestern.edu.*

## Using COMP_SCI 150 as the Programming Foundations course

| DSE Minor Requirements | Course Selection | How does this count for my major? | | Notes |
|---|---|---|---|---|
| | | Not Major Requirement | Major Requirement | |
| ***Data Science Core: 4 courses*** | | | | |
| Statistics Foundations | CHEM_ENG 312 or IEMS 303 | Basic engineering *Prob, Stat, Quality Control* | | Required for ChemE |
| Programming Foundations | COMP_SCI 150 | Unrestricted Elective | | |
| Intermediate Programming | COMP_SCI 217 | Unrestricted Elective | | |
| Applied Machine Learning | IEMS 304 | Unrestricted Elective | | |
| ***Data Science Studio Courses: 2 courses*** | | | | |
| | DATA_ENG 200 | Unrestricted Elective | | |
| | DATA_ENG 300 | | Technical Elective* (Cat D) | Double Count |
| ***Electives: 2 courses*** | | | | |
| | CHEM_ENG 379 | | Technical Elective (Cat A) | Double Count |
| | MAT_SCI 391 | | Technical Elective (Cat B) | Double Count |

**DATA_ENG 300 can be used as a Category D Technical Elective by petition*

## Using COMP_SCI 211 as the Programming Foundations course

| DSE Minor Requirements | Course Selection | How does this count for my major? | | Notes |
|---|---|---|---|---|
| | | Not Major Requirement | Major Requirement | |
| ***Data Science Core: 4 courses*** | | | | |
| Statistics Foundations | CHEM_ENG 312 or IEMS 303 | Basic engineering *Prob, Stat, Quality Control* | | Required for ChemE |
| Programming Foundations | COMP_SCI 211 | | Technical Elective (Cat B) | Double Count |
| Intermediate Programming | COMP_SCI 214 | Unrestricted Elective | | |
| Applied Machine Learning | COMP_SCI 349 | | Technical Elective (Cat B) | Double Count |
| ***Data Science Studio Courses: 2 courses*** | | | | |
| | DATA_ENG 200 | Unrestricted Elective | | |
| | DATA_ENG 300 | Unrestricted Elective | | |
| ***Electives: 2 courses*** | | | | |
| | CHEM_ENG 379 | | Technical Elective (Cat A) | Double Count |
| | DSE Approved Elective | Unrestricted Elective | | |