Northwestern
McCORMICK SCHOOL
OF ENGINEERING

MLDS Minor Advising for Applied Math Majors

Note: *The guidance here is based on the 2023-2024 Applied Math degree requirements. You can find Machine Learning and Data Science (MLDS) Minor curriculum details on the MLDS website.*

Overview

The MLDS minor consists of **8 courses**:

- ➔ 1 course in Programming Foundations
- ➔ 1 course in Statistics Foundations
- ➔ 4 specialization courses (Machine Learning, Data Science, or Hybrid)
- ➔ 2 electives in machine learning and data science.

The specific courses that satisfy these requirements can be found here.

Double Counting Rules

The McCormick School of Engineering requires that each minor consists of **4 unique courses** that are **not** used towards any other major or minor requirements. "Major requirements" are those designated as "Major Program (21 units)," which can be found on either MAS or the Applied Math website.

MAS dropdown for specific major requirements

Tips

- ➔ Be mindful of prerequisites for both the MLDS Specialization and Elective courses. Declaration of the minor does not imply that any prerequisites will be waived for you.

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The guides below represent some of the possible paths for Applied Math majors who are pursuing the MLDS minor. Other paths are possible – talk to your advisor or email dse@northwestern.edu.

Potential Machine Learning Specialization Tracks

Course Selection	How this counts towards your ESAM degree	Notes
Programming Foundations		
COMP_SCI 150	Major Requirement (Basic Technical)	
Statistics Foundation		
IEMS 303	Major Requirement (Probability and Statistics)	
Machine Learning Specialization		
COMP_SCI 111	Unrestricted Elective	Unique Course
COMP_SCI 214	Unrestricted Elective	Unique Course
COMP_SCI 348	Unrestricted Elective	Unique Course
COMP_SCI 349	Unrestricted Elective	Unique Course
MLDS Electives		
ES_APPM 345	Major Requirement (Engineering Sciences and Applied Mathematics)	
ES_APPM 475-1	Major Requirement (Mathematical Modeling)	

Potential option 1: Machine Learning specialization using ES_APPM courses

Course Selection	How this counts towards your ESAM degree	Notes
Programming Foundations		
COMP_SCI 150	Major Requirement (Basic Technical)	
Statistics Foundation		
IEMS 303	Major Requirement (Probability and Statistics)	
Machine Learning Specialization		
COMP_SCI 111	Unrestricted Elective	Unique Course
COMP_SCI 214	Major Requirement (Basic Technical)	
COMP_SCI 348	Unrestricted Elective	Unique Course
COMP_SCI 349	Unrestricted Elective	Unique Course
MLDS Electives		
ES_APPM 345	Major Requirement (Engineering Sciences and Applied Mathematics)	
MLDS Approved Elective	Unrestricted Elective	Unique Course

Potential option 2: Machine Learning specialization using a COMP_SCI course as a Major Requirement

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Potential Data Science Specialization Tracks

Course Selection	How this counts towards your ESAM degree	Notes
Programming Foundations		
COMP_SCI 150	Major Requirement (Basic Technical)	
Statistics Foundation		
IEMS 303	Major Requirement (Probability and Statistics)	
Data Science Specialization		
COMP_SCI 217	Unrestricted Elective	Unique Course
IEMS 304	Unrestricted Elective	Unique Course
DATA_ENG 200	Unrestricted Elective	Unique Course
DATA_ENG 300	Unrestricted Elective	Unique Course
MLDS Electives		
ES_APPM 345	Major Requirement (Engineering Sciences and Applied Mathematics)	
ES_APPM 475-1	Major Requirement (Mathematical Modeling)	

Potential option 1: Data Science specialization using ES_APPM courses

Course Selection	How this counts towards your ESAM degree	Notes
Programming Foundations		
COMP_SCI 150	Major Requirement (Basic Technical)	
Statistics Foundation		
IEMS 303	Major Requirement (Probability and Statistics)	
Data Science Specialization		
COMP_SCI 217	Unrestricted Elective	Unique Course
IEMS 304	Major Requirement (Basic Technical above 300-level)	
DATA_ENG 200	Unrestricted Elective	Unique Course
DATA_ENG 300	Major Requirement (Basic Technical above 200-level)	
MLDS Electives		
MLDS Approved Elective	Unrestricted Elective	Unique Course
MLDS Approved Elective	Unrestricted Elective	Unique Course

Potential option 2: Data Science specialization using DATA_ENG courses as a Major Requirement

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Potential Hybrid Specialization Tracks

Course Selection	How this counts towards your ESAM degree	Notes
Programming Foundations		
COMP_SCI 150	Major Requirement (Basic Technical)	
Statistics Foundation		
IEMS 303	Major Requirement (Probability and Statistics)	
Hybrid Specialization		
COMP_SCI 214	Major Requirement (Basic Technical)	
COMP_SCI 349	Unrestricted Elective	Unique Course
DATA_ENG 200	Unrestricted Elective	Unique Course
DATA_ENG 300	Major Requirement (Basic Technical above 200-level)	
MLDS Electives		
MLDS Approved Elective	Unrestricted Elective	Unique Course
MLDS Approved Elective	Unrestricted Elective	Unique Course

Potential option: Hybrid specialization with MLDS Electives as unique courses