

Guidance for Industrial Engineering Majors

- ❖ The guidance here is based on the [2020 IE 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.
 - 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.
- ❖ Your five basic engineering courses must cover **four** different categories (noted in the tables below). Some DSE electives can also apply towards basic engineering:
 - CIV_ENV 304: *Systems Engineering*
 - ES_APPM 345: *Computer Architecture and Numerical Methods*

The guides below represent some possible paths for IE 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 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	IEMS 303		Yes	Double Count
Programming Foundations	COMP_SCI 211	Basic engineering <i>Computer Programming</i>		Required for IE
Intermediate Programming	COMP_SCI 217	Basic engineering <i>Computer Programming</i>		Required for IE
Applied Machine Learning	IEMS 304		Yes	Double Count
Data Science Studio Courses: 2 courses				
	DATA_ENG 200	Unrestricted Elective		
	DATA_ENG 300	Unrestricted Elective		
Electives: 2 courses				
	IEMS 313		Yes	Double Count
	DSE Approved Elective	Unrestricted Elective		This can be an IEMS course; it just can't be used towards IE major electives.

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	IEMS 303		Yes	Double Count
Programming Foundations	COMP_SCI 150		Yes	Double Count
Intermediate Programming	COMP_SCI 217	Basic engineering <i>Computer Programming</i>		Required for IE
Applied Machine Learning	IEMS 304	Basic engineering <i>Prob, Stat, Quality Control</i>		Required for IE
Data Science Studio Courses: 2 courses				
	DATA_ENG 200	Unrestricted Elective		
	DATA_ENG 300	Unrestricted Elective		
Electives: 2 courses				
	IEMS 313		Yes	Double Count
	DSE Approved Elective	Unrestricted Elective		This can be an IEMS course; it just can't be used towards IE major electives.