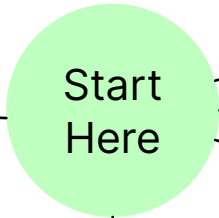


To be clear, you don't have to take these classes, and most people don't, unless they are interested in this area.

| | | |
|-----------------------|----------------------|---|
| PHYSICS 202 | General Physics: E&M | 5 |
|-----------------------|----------------------|---|

Does not count towards the major. If you have no experience, take this. Roughly equivalent to AP Computer Science A.



| Calculus Sequence | | |
|-------------------|---------|---|
| MATH 221 | Calc I* | 5 |

*AP Calc AB (4-5)

| | | |
|-------------|----------|---|
| MATH 222 | Calc II* | 4 |
|-------------|----------|---|

*AP Calc BC (4-5)

| | | |
|--------------------|----------|---|
| MATH 234 | Calc III | 4 |
|--------------------|----------|---|

For students declaring CS Fall 2024 or later, Calc III does not count for any major requirements.

- Math 275/276 are advanced versions of 221/222 offered by invitation.
- For details about WES-Calculus, see <https://math.wisc.edu/undergraduate/wes/>

| | | |
|-------------------|--|---|
| ECE 203 | Signals, Information, & Computation | 3 |
|-------------------|--|---|

| | | |
|-------------------|------------------|---|
| ECE 230 | Circuit Analysis | 4 |
|-------------------|------------------|---|

| | | |
|-------------------|---------------------|---|
| ECE 330 | Signals and Systems | 3 |
|-------------------|---------------------|---|

| | | |
|----------------------|-----------------------------|---|
| ECE/CS 352 | Digital System Fundamentals | 3 |
|----------------------|-----------------------------|---|

| | | | | | |
|----------------------|--------|---------------------------------|-------|----------|---|
| ECE/CS 552 | | Introduction to Architecture | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

| | | | | | |
|-----------------------|--------------------------------------|-------|-------|----------|---|
| MATH/CS 537 | Introduction to Operating Systems | | | | 4 |
| Reg. | Theory | SW/HW | Appl. | Elective | |

| | | | | | |
|------------------------|----------------------------|-------|-------|----------|---|
| COMP SCI 577 | Introduction to Algorithms | | | | 4 |
| Reg. | Theory | SW/HW | Appl. | Elective | |

Basic Computer Science

| | | | | | |
|------------------------|--------------------------------------|-------|-------|----------|---|
| COMP SCI 252 | Introduction to Computer Engineering | | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

| | | | | | |
|-----------------------|---------------|-------|-------|----------|---|
| MATH/CS 240 | Discrete Math | | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

| | | | | | |
|------------------------|----------------|-------|-------|----------|---|
| COMP SCI 300 | Programming II | | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

| | | | | | |
|------------------------|---|-------|-------|----------|---|
| COMP SCI 354 | Machine Organization and Programming | | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

| | | | | | |
|------------------------|-----------------|-------|-------|----------|---|
| COMP SCI 400 | Programming III | | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

Linear Algebra

| | | |
|--------------------|----------------|---|
| MATH 340 | Linear Algebra | 3 |
|--------------------|----------------|---|

MATH 320 is Linear Algebra & Diff Eq. in one semester, for engineers.

MATH 340 is the default Linear Algebra, computation based.

MATH 341 is Linear Algebra, proof based. People considering math majors should take 341 instead of 340.

MATH 375 also fulfills this requirement.

Probability or Statistics

| | | |
|--------------------|--|---|
| STAT 324 | Introductory Applied Statistics for Engineers | 3 |
|--------------------|--|---|

STAT/MATH 309, STAT 311, STAT 324, MATH 331, STAT 333, STAT 340 Data Science Modeling II, **STAT 371, STAT/MATH 431** Introduction to the Theory of Probability, **MATH 531** Probability Theory

| | | | | | |
|------------------------|--------|---|-------|----------|---|
| COMP SCI 539 | | Introduction to Artificial Neural Networks | | | 3 |
| Reg. | Theory | SW/HW | Appl. | Elective | |

| | | | | |
|------------------------|----------------------------------|-------|-------|----------|
| COMP SCI 540 | Intro to Artificial Intelligence | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective |

while not an official prerequisite, prior familiarity with linear algebra is very helpful for CS 540

| | | | | | |
|------------------------|----------------------|-------|-------|----------|---|
| COMP SCI 532 | Matrix Methods in ML | | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

| | | | | | |
|-----------------------|--------|---------------------------------|-------|----------|---|
| MATH/CS 435 | | Introduction to Cryptography | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

| | | | | | |
|-----------------------|--------|----------------------------------|-------|----------|---|
| MATH/CS 475 | | Introduction to Combinatorics | | | 3 |
| Req. | Theory | SW/HW | Appl. | Elective | |

Most of the computer courses are hidden here in this overview. I have left some which only require 300, especially the AI ones, as well as OS and Algos which illustrate where the earlier courses lead.

A Birds-Eye View of the CS Major for Incoming Freshmen

by Michael Noguera (<https://noguera.dev/course-map>)

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Key: Solid lines indicate requirements. Dashed lines indicate “is sufficient for”, as a minimum requirement, or “should be taken before”, where the requirement is not specified but a logical order exists.

What are the actual math requirements?

- **Calc I** and **Calc II** (in any form)
- A 3-credit **Linear Algebra** class
- A 3-credit **Probability or Statistics** class

Also, a single class cannot be used to meet more than one of the requirements. For example, Cryptography (Math/CS 435) can be used as either an advanced math class or a CS elective, but not both.

What are the actual CS requirements beyond the explicitly-required classes?

There are many more courses down here in math-land.

| | | | | |
|-----------|--------|-------|-------|----------|
| | Theory | SW/HW | Appl. | Elective |
| # credits | 3 | 6-8 | 3 | 6-8 |