Typical **MatSci course** sequence (and pre-requisites)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **FALL** | **WINTER** | **SPRING** |
| **YEAR 1** | **EA1** | **EA2** | **EA3** |
| **Math 220-1** | **Math 220-2** | **Math 228-1** |
| **Chem 1X1 & lab** | **Chem 1X2 &lab** | **MatSci 3012 (Chem 1X1)** |
| **MatSci 190 (UR)1** | **DTC1** | **DTC2** |
| **YEAR 2** | **EA4** | **CivE 2163(EA2)** | **Math 228-2** |
| **MatSci 3012 (Chem 1X1)** | **Phys 135-2 & lab** | **Phys 135-3 &lab** |
| **MatSci 314 (Chem 1X2, Math 228-1 or Math 230-1, Phys 135-1 or equiv)** | **MatSci 315 (MatSci 314)** | **MatSci 316-1 (MatSci314,**  **315)** |
| **Elective4** | **Elective** | **Elective** |
| **YEAR 3** | **MatSci 316-2 (MatSci 315)** | **MatSci 331 (MatSci 301; MatSci 314 or Chem 342-1, MatSci 316-1& 2 recommended)** | **MatSci 332 (CMatSci 316-1 & 2- may be taken concurrently; CivE 216 or consent of instructor)** |
| **MatSci 351-1 (MatSci 301,**  **EA4, Phys 135-2&3)** | **MatSci 351-2 (MatSci 351-1)** | **MatSci 391 (MatSci 301 or 201)** |
| **Elective** | **Elective** | **Elective** |
| **Elective** | **Elective** | **Elective** |
| **YEAR 4** | **MatSci 390 (MatSci 315, 316-1& 2 or consent of instructor)** | **MatSci 361 (EA4, Phys. 135-2&3)** | **MatSci 396-2 (Sr. standing)** |
| **Elective** | **MatSci 396-1(Sr. standing)** | **Elective** |
| **Elective** | **Elective** | **Elective** |
| **Elective** | **Elective** | **Elective** |

1. **MatSci 190** is not required, but recommended for students interested in MSE. Satisfies an unrestricted elective, as does any **MatSci 195** (TBD).
2. **MatSci 301** is offered in spring & fall. MSE majors should take it no later than fall of year 2, concurrent with **MatSci 302 lab**.
3. **CivE 216** is offered every quarter and may be taken any time after EA2, but before MatSci 332.
4. **Electives:** Unrestricted elective (5), Basic engineering elective (1 from recommended list in MAS), Technical Elective (5 from Area of Concentration Worksheet), Social Science and Humanities Theme (see how to complete theme). \*\*As of fall 2023, the Basic Engineering elective becomes one of 6 required technical electives.\*\*

# Basic engineering (5):

* 1. 301 – Materials Science Principles (spring or fall) – 80 minute weekly lab
  2. 314 – Thermodynamics of Materials (fall)
  3. 315 – Phase Transformations and Diffusion of Materials (winter) – 2 hr weekly lab
  4. CivE 216 – Mechanics of Materials (fall, winter, spring) – biweekly lab
  5. Elective from list in MAS (five BE courses must cover four topics, so list is limited)

# Required core courses (11)

* 1. 316-1 Microstructural Dynamics I (spring) – 2 hr weekly lab
  2. 316-2 Microstructural Dynamics II (fall) – 3 hr weekly lab
  3. 331 Soft Materials (winter) - project
  4. 332 Mechanical Behavior of Solids (spring) –labs (experimental & computational) & project
  5. 351-1 Introductory Physics of Materials I (fall)
  6. 351-2 Introductory Physics of Materials II (winter) –2 hr biweekly lab
  7. 361 Crystallography and Diffraction (winter) –3 hour weekly labs
  8. 390 Materials Design (spring) – some labs & computational team project; 316-2 v. important
  9. 391 Process Design (fall); spring in 2024.
  10. 396-1&2 Senior Project in Materials Science and Engineering (f, w, s) – Students are responsible for seeking out a project with a MatSci faculty member.

# Area of Concentration/ Technical Electives (5) \*(this becomes 6 electives as of fall 2023)\*

* 1. Two 300-level MSE courses (excluding 394, 399, some 395); three 300-level MSE courses for students interested in the McCormick Undergraduate Honors program.
  2. Three math, science, engineering \*this becomes four as of fall 2023\*