

NUCLEAR ENGINEERING - BS

Program Requirements

The freshman year is identical for degrees in aerospace engineering, architectural engineering, civil engineering, computer engineering, computer science, electrical engineering, electronic systems engineering technology, environmental engineering, industrial distribution, industrial engineering, interdisciplinary engineering, manufacturing and mechanical engineering technology, mechanical engineering, multidisciplinary engineering technology, nuclear engineering, ocean engineering, and petroleum engineering (Note: not all programs listed are offered in Qatar). The freshman year is slightly different for chemical engineering, biomedical engineering and materials science and engineering degrees in that students take CHEM 119 or CHEM 107/CHEM 117 and CHEM 120.

Students pursuing degrees in biological and agricultural engineering should refer to the specific curriculum for this major. It is recognized that many students will change the sequence and number of courses taken in any semester. Deviations from the prescribed course sequence, however, should be made with care to ensure that prerequisites for all courses are met.

First Year

| Fall | | Semester Credit Hours |
|---|---|-----------------------|
| CHEM 107 | General Chemistry for Engineering Students ^{1,4} | 3 |
| CHEM 117 | General Chemistry for Engineering Students Laboratory ^{1,4} | 1 |
| ENGL 103 or ENGL 104 | Introduction to Rhetoric and Composition ¹ or Composition and Rhetoric | 3 |
| ENGR 102 | Engineering Lab I - Computation ¹ | 2 |
| MATH 151 | Engineering Mathematics I ^{1,2} | 4 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ | | 3 |
| Semester Credit Hours | | 16 |
| Spring | | |
| ENGR 216/PHYS 216 | Experimental Physics and Engineering Lab II - Mechanics ¹ | 2 |
| MATH 152 | Engineering Mathematics II ¹ | 4 |
| PHYS 206 | Newtonian Mechanics for Engineering and Science ¹ | 3 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ | | 3 |
| Select one of the following: | | 3-4 |
| CHEM 120 | Fundamentals of Chemistry II ^{1,4} | |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ^{3,5} | | |
| Semester Credit Hours | | 15-16 |
| Total Semester Credit Hours | | 31-32 |

¹ A grade of C or better is required.

- ² Entering students will be given a math placement exam. Test results will be used in selecting the appropriate starting course which may be at a higher or lower level.
- ³ Of the 21 hours shown as University Core Curriculum electives, 3 must be from creative arts (see AREN curriculum for more information), 3 from social and behavioral sciences (see IDIS curriculum for more information), 3 from language, philosophy and culture (see CVEN, EVEN and PETE curriculum for more information), 6 from American history and 6 from government/political science. The required 3 hours of international and cultural diversity and 3 hours of cultural discourse may be met by courses satisfying the creative arts, social and behavioral sciences, language, philosophy and culture, and American history requirements if they are also on the approved list of international and cultural diversity (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>) courses and cultural discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>) courses.
- ⁴ BMEN, CHEN and MSEN require 8 hours of fundamentals of chemistry which are satisfied with CHEM 119 or CHEM 107/CHEM 117 and CHEM 120; Students with an interest in BMEN, CHEN and MSEN can take CHEM 120 second semester freshman year. CHEM 120 will substitute for CHEM 107/CHEM 117.
- ⁵ For BS-PETE, allocate 3 hours to core communications course (ENGL 210, COMM 203, COMM 205, or COMM 243) and/or 3 hours to UCC elective. For BS-MEEN, allocate 3 hours to core communications course (ENGL 203, ENGL 210, or COMM 205) and/or 3 hours to UCC elective.

Second Year

| Fall | | Semester Credit Hours |
|---|--|-----------------------|
| ENGR 217/PHYS 217 | Experimental Physics and Engineering Lab III - Electricity and Magnetism | 2 |
| MATH 251 | Engineering Mathematics III | 3 |
| MEEN 221 | Statics and Particle Dynamics | 3 |
| NUEN 101 | Principles of Nuclear Engineering | 1 |
| NUEN 201 | Introduction to Nuclear Engineering I | 3 |
| PHYS 207 | Electricity and Magnetism for Engineering and Science | 3 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ | | 3 |
| Semester Credit Hours | | 18 |
| Spring | | |
| ECEN 215 | Principles of Electrical Engineering | 3 |
| MATH 308 | Differential Equations | 3 |
| NUEN 265 | Materials Science for Nuclear Energy Applications | 3 |
| MEEN 315 or NUEN 315 | Principles of Thermodynamics or Thermodynamics in Nuclear Systems | 3 |
| NUEN 302 | Introduction to Nuclear Engineering II | 3 |
| High Impact Experience ⁶ | | 0 |
| NUEN 102 | Nuclear Engineering Practice | |
| Semester Credit Hours | | 15 |

Total Program Hours 125

Third Year

Fall

| | | |
|------------------------------|--|---|
| MATH 309 | Linear Algebra for Differential Equations ¹ | 3 |
| MEEN 344 | Fluid Mechanics | 3 |
| NUEN 301 | Nuclear Reactor Theory | 3 |
| NUEN 309/ SENG 309 | Radiological Safety | 3 |
| Select one of the following: | | 3 |
| COMM 203 | Public Speaking | |
| COMM 205 | Communication for Technical Professions | |
| ENGL 203 | Writing about Literature | |
| ENGL 210 | Technical and Professional Writing | |

Semester Credit Hours 15

Spring

| | | |
|-------------------------|--|---|
| ISEN 302 | Economic Analysis of Engineering Projects | 2 |
| MEEN 461 | Heat Transfer | 3 |
| NUEN 303 | Radiation Detection and Isotope Technology Laboratory | 3 |
| NUEN 304 | Nuclear Reactor Analysis | 3 |
| NUEN 329 or MATH 417 | Analytical and Numerical Methods or Numerical Methods | 3 |

Semester Credit Hours 14

Fourth Year

Fall

| | | |
|---|---|---|
| NUEN 405 | Nuclear Engineering Experiments | 3 |
| NUEN 406 | Nuclear Engineering Systems and Design | 3 |
| Select one of the following: | | 3 |
| NUEN 418 | Fuel Assembly and 3-D Reactor Core Design and Modeling | |
| NUEN 430 | Computer Applications in Nuclear Engineering | |
| NUEN 460 | Nuclear Plant Systems and Transients | |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ | | 3 |
| Technical elective ⁷ | | 3 |

Semester Credit Hours 15

Spring

| | | |
|---|--------------------------------|---|
| NUEN 410 | The Design of Nuclear Reactors | 4 |
| NUEN 481 | Seminar | 1 |
| University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ | | 6 |
| NUEN Technical elective (http://catalog.tamu.edu/undergraduate/course-descriptions/nuen/) ⁷ | | 3 |
| Technical elective ⁷ | | 3 |

Semester Credit Hours 17

Total Semester Credit Hours 94

⁶ All students are required to complete a high-impact experience in order to graduate. The list of possible high-impact experiences is available in the NUEN advising office.

⁷ As approved by departmental advisor.