



College of Engineering
The Klipsch School of
Electrical and Computer Engineering

BSEE REQUIREMENTS

2015-2016

This document presents a summary of the requirements for earning a Bachelor of Science degree in Electrical Engineering (BSEE) from New Mexico State University (NMSU). It is intended as a guide, and is in no way meant to replace or amend the 2015-2016 Undergraduate Catalog.

Catalog Selection: The requirements outlined below are specific to the 2015-2016 catalog and may be different from those of other catalogs. The requirements set forth in the 2015-2016 catalog are in effect from the beginning of the 2015 summer term until the end of the 2020 spring term. Students graduating after their catalog of matriculation has expired may meet the requirements of any catalog in effect at the time of graduation. Note, however, that changing catalogs may render classes already taken inapplicable toward graduation. Always check with an advisor before deciding to change catalogs.

Departmental Responsibilities: The Klipsch School is responsible for:

1. Providing current lists of approved elective courses for each category. The lists of approved electives are subject to change at any time. To ensure proper course selection, when registering be sure to use an up-to-date list, or check with an advisor. Lists of currently acceptable electives are also available at ece.nmsu.edu
2. Assisting students in curriculum planning, selection of electives, and scheduling.
 - a. The ECE department maintains an “Open Door” policy. All faculty members are available for consultation.
 - b. Each semester, before registering for classes, all undergraduate students must be advised. The department office maintains a list of advisor assignments.

Student Responsibilities: *It is the responsibility of each student to ensure that all the requirements for graduation have been met.* In general, each student is responsible for:

1. Following all university regulations, as listed in the 2015-2016 NMSU Catalog. The catalog is the ultimate authority when it comes to regulations, this BSEE REQUIREMENTS handout is merely a summary of the information specific to Electrical Engineering students.
2. Following all college requirements, as listed in the 2015-2016 NMSU catalog.
3. Following all departmental requirements, as listed in the 2015-2016 NMSU catalog. In particular, be aware that elective choices must be made such that:
 - a. The selected course is a **currently** approved elective in the desired category.
 - b. A minimum of 132 credits is completed, of which 45 must be numbered 300-499.

4. Taking courses in the proper sequence. Most courses have co- and/or prerequisites. These are listed in the course descriptions of the 2015-2016 NMSU catalog. A prerequisite **must** have been completed (**with a grade of `C`, or better**) prior to enrolling in the class, while a co-requisite may be taken either at the same time, or prior to, the class. Enrolling in a class without the proper preparation is grounds for administrative removal from the course, potentially impacting on full-time status, financial aid eligibility, and/or graduation plans. A summary of the co- and prerequisites for Electrical Engineering classes is included as Table 5. Co- and prerequisites for a class may change in the future, so check the current catalog, or ask the course instructor, for the latest requirements.

Note also that some prerequisites apply universally and are not listed for individual classes. For example: the university has made ENGL 111 a prerequisite to **all** courses numbered 300-499. The college has made MATH 192 a co-requisite to all engineering courses numbered 300-499. The department has made EE 161 a prerequisite to all EE classes numbered 300-499.

5. Monitoring their official NMSU email account. Each student is issued an email address in the @nmsu.edu domain. This address is used for official communication and students are responsible for all messages sent to that address.

Transfer Credit: Credit earned at other institutions is generally accepted, however:

- Engineering credit must be earned at an ABET accredited school.
- Physics must be calculus-based.
- If the NMSU requirement includes a laboratory, the transfer credit must include a lab.
- A grade of 'C', or better, must have been earned.
- Capstone Design (EE 418 & EE 419) and EE Electives may not be transferred.

Table 1

BSEE Degree Requirements 2015-2016

General Education Requirements (43 credits)

| State of New Mexico General Education Common Core (37 credits) | | Credits |
|---|---|---------|
| Area I: Written Communication | Two courses ¹ | 7 |
| Oral Communication | One course ¹ | 3 |
| Area II: Mathematics | Calculus I (MATH 191) | 4 |
| Area III: Natural Science | General Chemistry I ² (CHEM 111) | 4 |
| | Engineering Physics I ² (PHYS 215) | 4 |
| Area IV: Social & Behavioral Sciences | Two or Three classes ^{1,3} | 6-9 |
| Area V: Humanities & Fine Arts | Two or Three classes ^{1,3} | 6-9 |

NMSU General Education Requirements (6 credits)

| | | |
|---------------------------------|--------------------------|---|
| Viewing a Wider World Electives | Two courses ¹ | 6 |
|---------------------------------|--------------------------|---|

Program Specific Requirements (87 credits)

Mathematics & Natural Science (21 credits)

| | | |
|----------|-------------------------------------|---|
| MATH 192 | Calculus II | 4 |
| MATH 291 | Calculus III | 3 |
| MATH 392 | Differential Equations | 3 |
| EE 210 | Engineering Analysis I | 4 |
| EE 310 | Engineering Analysis II | 3 |
| PHYS 216 | Engineering Physics II ² | 4 |

Engineering (65 credits)

| | | |
|-----------------------|---|----|
| ENG100 | Introduction to Engineering | 3 |
| EE 161 | Computer Aided Problem Solving ² | 4 |
| EE 162 | Digital Circuit Design ² | 4 |
| EE 260 | Embedded Systems ² | 4 |
| EE 280 | DC and AC Circuits ² | 4 |
| EE 312 | Signals & Systems I | 3 |
| EE 314 | Signals & Systems II ² | 4 |
| EE 351 | Applied Electromagnetics ² | 4 |
| EE 380 | Electronics I ² | 4 |
| EE 391 | Introduction to Electric Power Engineering ² | 4 |
| EE 418 | Capstone Design I ⁴ | 3 |
| EE 419 | Capstone Design II ⁴ | 3 |
| EE 461 | Systems Engineering & Project Management | 3 |
| EE Electives | Four courses ⁴ from Table 2 | 12 |
| Engineering Electives | One course from Table 3 | 3 |
| Technical Electives | Six credits from Table 4 | 6 |

Total 132

Notes:

1. See the 2015-2016 Undergraduate Catalog for course lists and details.
2. Including laboratory.
3. Students must complete 15 total credits from these two areas, with at least 6 credits from each area.
4. Transfer credit not accepted.

Table 2

EE Electives
 Select Four Courses (12 Credits Minimum) from Three Areas

| Course | Title | Credits | Course | Title | Credits |
|----------------------------------|---------------------------------------|---------|-------------------------------|-------------------------------------|---------|
| Communications | | | Micro-Electronics/VLSI | | |
| EE 496 | Communications Systems..... | 4 | EE 425 | Intro to Semiconductor Devices..... | 3 |
| EE 497 | Digital Communications Systems I..... | 3 | EE 480 | Introduction to VLSI..... | 4 |
| Computers | | | EE 482 | Electronics II | 3 |
| EE 363 | Computer Systems Architecture..... | 4 | EE 483 | RF Microelectronics | 3 |
| EE 469 | Communications Networks..... | 3 | EE 485 | Analog VLSI Design..... | 3 |
| EE443 | Mobile App Development..... | 3 | EE 486 | Digital VLSI Design | 3 |
| Controls | | | Photonics | | |
| EE 475 | Control Systems II | 3 | EE 370 | Geometrical Optics | 4 |
| EE 476 | Computer Control Systems | 3 | EE 470 | Physical Optics | 3 |
| Digital Signal Processing | | | EE 471 | Modern Experimental Optics | 2 |
| EE 395 | Introduction to DSP | 3 | EE 473 | Introduction to Optics | 4 |
| EE 442 | Real-Time DSP | 3 | EE 477 | Fiber Optics Systems | 4 |
| EE 446 | Digital Image Processing | 3 | EE 478 | Optical Sources & Detectors..... | 4 |
| Electromagnetics | | | EE 479 | Lasers and Applications | 4 |
| EE 452 | Introduction to Radar | 3 | Power Systems | | |
| EE 453 | Microwave Engineering | 3 | EE 431 | Power Systems II | 3 |
| EE 454 | Antennas and Radiation | 3 | EE 432 | Power Electronics | 3 |
| | | | EE 493 | Power Systems III..... | 3 |
| | | | EE 494 | Distribution Systems..... | 3 |
| | | | Space Systems | | |
| | | | EE 460 | Space System Mission Design | 3 |

Table 3

Engineering Electives
Select One Course

| Course | Title | Credits |
|---------|--------------------------------------|---------|
| C E 233 | Mechanics-Statics | 3 |
| C E 301 | Mechanics of Materials..... | 3 |
| I E 365 | Quality Control | 3 |
| I E 411 | Occupational Safety | 3 |
| I E 413 | Operations Research I..... | 3 |
| I E 415 | Stochastic Processes Modeling | 3 |
| I E 423 | Operations Research II..... | 3 |
| I E 460 | Evaluation of Engineering Data | 3 |
| I E 466 | Reliability | 3 |
| I E 467 | Simulation Modeling | 3 |
| M E 234 | Mechanics-Dynamics..... | 3 |
| M E 236 | Engineering Mechanics I | 3 |
| M E 237 | Engineering Mechanics II | 3 |
| M E 240 | Thermodynamics..... | 3 |

Any A E course numbered 300 – 499

Any CH E course numbered 300 - 490 except: CH E 311, 330, 391, 395V, 398, 430, 451, and 490

Any M E course numbered 300 - 498 except: M E 330, 345, 400, 401, 405, 430, and 449

Table 4

Technical Electives
Select Two Courses

| Course | Title | Credits |
|-----------------------|-----------------------------------|---------|
| ASTR 401 | Modern Astrophysics | 3 |
| C S 371 | Software Development..... | 3 |
| C S 470 | Functional Programming..... | 3 |
| C S 471 | Language Structure I..... | 3 |
| C S 472 | Logic Programming..... | 3 |
| C S 474 | Operating Systems I..... | 3 |
| C S 475 | Artificial Intelligence I..... | 3 |
| C S 476 | Computer Graphics I..... | 3 |
| C S 480 | Linux System Administration | 3 |
| C S 482 | Database Management I..... | 3 |
| C S 485 | User Interface Design | 3 |
| C S 491 | Parallel Programming | 3 |
| CHEM 313 | Organic Chemistry I..... | 3 |
| CHEM 314 | Organic Chemistry II | 3 |
| E T 377 ¹ | Computer Networking..... | 3 |
| MATH 331 | Modern Algebra | 3 |
| MATH 332 | Intro to Analysis..... | 3 |
| Math 371 | Statistics | 3 |
| MATH 377 | Numerical Methods..... | 3 |
| MATH 431 | Algebraic Coding | 3 |
| MATH 471 | Complex Variables | 3 |
| MATH 472 | Fourier Series Problems | 3 |
| MATH 473 | Calculus of Variations..... | 3 |
| MATH 480 | Matrix & Linear Algebra | 3 |
| MATH 481 | Advanced Linear Algebra | 3 |
| PHYS 315 | Modern Physics..... | 3 |
| STAT 470 | Probability..... | 3 |
| STAT 480 | Statistics..... | 3 |
| WERC 381 ¹ | Renewable Energy | 3 |
| WERC 382 ¹ | Solar Energy | 3 |
| WERC 384 ¹ | Wind and Water Energy..... | 3 |
| IE451 | Engineering Economy | 3 |

Any course from Tables 2or 3

Any EE course numbered 300-499

Any Physics course numbered 400-499

Any Chemistry course numbered 400-499, except CHEM 442

Notes: 1. Only one of these courses allowed.

Table 5

Co- and Pre-requisites

| Course | Title | Pre-requisites ¹ | Co-requisites |
|---------|--|--------------------------------|---------------|
| E E 161 | Computer Aided Problem Solving | | MATH 190 |
| E E 162 | Digital Circuit Design | MATH 190 and E E 161 | |
| E E 210 | Engineering Analysis I | MATH 192 and E E 161 | |
| E E 260 | Embedded Systems | E E 162 | |
| E E 280 | DC & AC Circuits | MATH 192 and PHYS 216 | |
| E E 310 | Engineering Analysis II | MATH 291 and E E 210 | |
| E E 312 | Signals & Systems I | E E 210, E E 280 and MATH 392 | |
| E E 314 | Signals & Systems II | E E 312 | |
| E E 351 | Applied Electromagnetics | E E 280 and E E 310 | |
| E E 363 | Computer Systems Architecture I | E E 260 | |
| E E 370 | Geometrical Optics | MATH 191 | |
| E E 380 | Electronics I | E E 162, E E 280, and CHEM 111 | |
| E E 391 | Introduction to Electric Power Engineering | E E 280 | |
| E E 395 | Introduction to Digital Signal Processing | E E 314 | |
| E E 401 | Research Topics in Electrical Engineering | | E E 418 |
| E E 418 | Capstone Design I | E E 260, 314, 351, 380 and 391 | E E 461 |
| E E 419 | Capstone Design II | E E 418 | |
| E E 425 | Introduction to Semiconductor Devices | E E 351 and E E 380 | |
| E E 431 | Power Systems II | E E 391 | |
| E E 432 | Power Electronics | E E 380 and E E 391 | E E 314 |
| E E 442 | Real-Time Digital Signal Processing | E E 395 | |
| E E 446 | Digital Image Processing | E E 395 | |
| E E 452 | Introduction to Radar | E E 351 | E E 496 |
| E E 453 | Microwave Engineering | E E 351 | |
| E E 454 | Antennas and Radiation | E E 351 | |
| E E 460 | Satellite Design | Junior Standing | |
| E E 461 | Program Management | Junior Standing | |
| E E 469 | Digital Communications Networks | E E 162 and E E 210 | |
| E E 470 | Physical Optics | E E 370 and PHYS 216 | |
| E E 471 | Modern Experimental Optics | | E E 470 |
| E E 473 | Introduction to Optics | PHYS 216 | |
| E E 475 | Control Systems II | E E 314 | |
| E E 476 | Computer Control Systems | E E 314 | |
| E E 477 | Fiber Optic Communication Systems | E E 351 | |
| E E 478 | Optical Sources, Detectors, and Radiometry | E E 370 and PHYS 216 | |
| E E 479 | Lasers and Applications | E E 351 | |
| E E 480 | Introduction to VLSI | E E 260 and E E 380 | |
| E E 482 | Electronics II | E E 380 | |
| E E 483 | RF Microelectronics | E E 351 and E E 480 | |
| E E 485 | Analog VLSI Design | E E 312 and E E 480 | |
| E E 486 | Digital VLSI Design | E E 480 | |
| E E 490 | Selected Topics | Consent of Instructor | |
| E E 493 | Power Systems III | E E 391 | |
| E E 494 | Distribution Systems | E E 431 | E E 493 |
| E E 496 | Introduction to Communications Systems | E E 314 | |
| E E 497 | Digital Communications Systems I | E E 314 | |

Notes: 1. A grade of 'C', or better, is required in all prerequisite classes.

ECE Core Curriculum (2015-2016)

