NORTHERN NEW MEXICO COLLEGE

College Handbook

College of Engineering and Technology

Version Spring 2016

I) Academic Organizational Chart

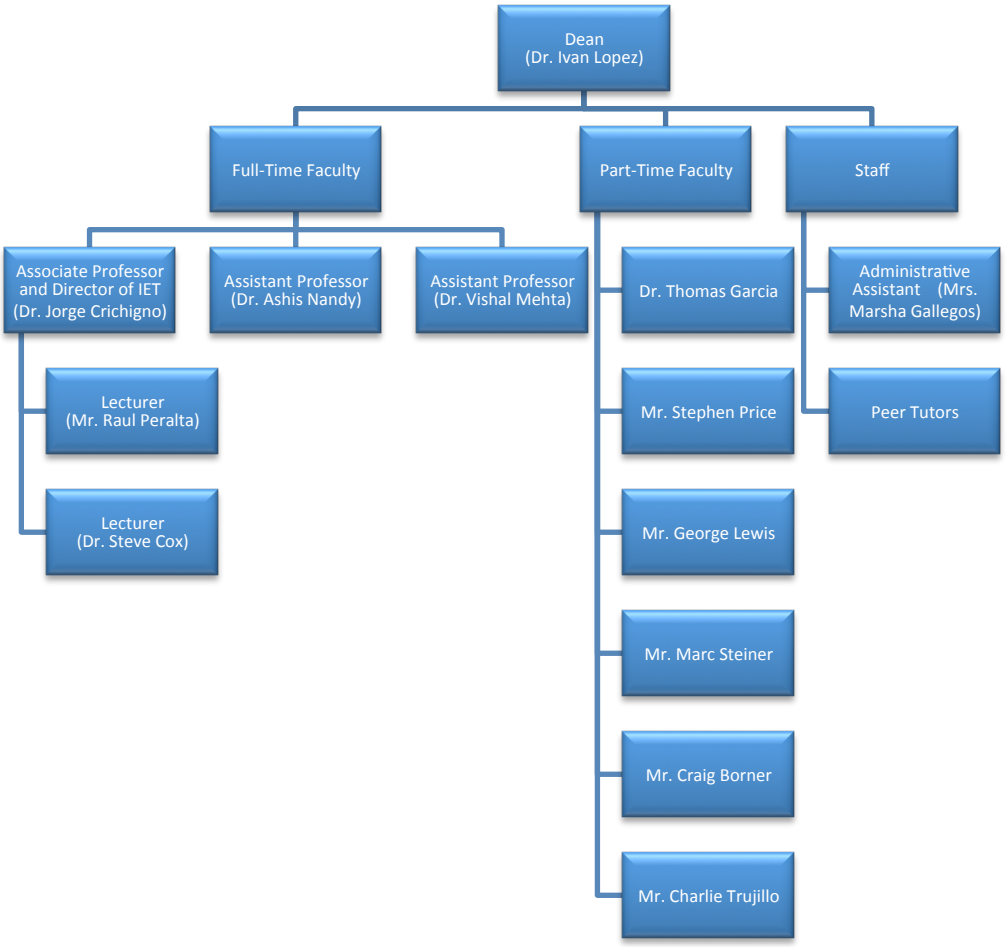

Figure: College of Engineering and Technology Organizational Chart

II) Introduction to the College of Engineering and Technology

Mission

The mission of the College of Engineering and Technology at Northern New Mexico College is to provide education of the highest quality to students in its various certificates, associates, and bachelors degrees. In addition, we prepare students to consider pursuit of a career or an advanced degree by providing outreach and professional services at current academic and industrial standards.

Vision

By 2019, the College of Engineering and Technology at Northern New Mexico College will provide regionally recognized and ABET accredited bachelor of engineering technology programs. To achieve this mission the department will:

- Develop strategic alliances with academic institutions as well as key players in the industry.
- Graduate students that are competent in applying technical and critical thinking skills to solve real world problems.
- Have a course completion rate of at least seventy five percent for lower division courses and ninety percent for upper division courses.
- Establish a six-year graduation average rate above thirty percent for bachelor degrees
- Establish a three-year graduation average rate above thirty percent for associate degrees.

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III) Admission Policy

III.a) Admission Requirements for the Associate of Applied Science Programs

All students admitted to NNMC will be admitted to the Associate Degree of Applied Science Program if they declare the degree on the Degree Declaration form.

III.b) Admission Requirements for the Associate of Engineering Programs

All students accepted to NNMC will be admitted under the Associate Degrees if they declare the degree by filing the degree declaration form.

III.c) Admission Requirements for the Bachelor of Engineering Programs

All students that attempt admission for any of the Bachelor Programs must fulfill the following requirements:

(a) Have completed the degree declaration form at the registrar office;

(b) I) Information Engineering Technology:
Have completed the following courses with a grade average of 2.5, and a minimum grade of C for each course:

- ENGR 120L Introductory Mathematics for Engineering Applications
- CS 201 Math Foundation of Computer Science
- EECE 152L Computer Programming
- EECE 231 Intermediate Programming
- EECE 132 Computer Networks I
- IT 250 Introduction to Databases

II) Electromechanical Engineering Technology
Have completed the following courses with a grade average of 2.5, and a minimum grade of C for each course:

- ENGR 120L Introductory Mathematics for Engineering Applications
- PHYS 215L Engineering Physics I/Lab
- DRFT 100 Computer Aided Drafting
- MET 201 Applied Mechanics I
- EET 200/L Electrical Systems I/Lab

(c) Have received, when all the above requirements have been fulfilled, a letter of admission to the bachelor program from the Faculty Academic Advisor or Dean.

Note: If a student does not fulfill the admission requirements for the Bachelor Programs, the student will still be eligible to finish the degree requirements for an Associate of Engineering Degree.

III.d) Admission Requirements for the Post Baccalaureate Engineering Certificate

All students that attempt admission for any of the Post Baccalaureate Engineering Programs must fulfill the following minimum requirements:

(a) Have earned a Bachelor degree in the engineering field.
(b) Have completed the online admission application form.
(c) Have earned a minimum 3.0 GPA in the Bachelor degree.
(d) Have submitted three letters of recommendation from faculty or previous/current employers.

Although not currently required, we encourage students to submit Graduate Record Examination (GRE) scores along with the application.

Note: Admission is competitive and completion of the above requirements does not suffice to be admitted to the program. The College of Engineering and Technology is ultimately responsible for granting admission to a Post Baccalaureate Certificate.

VI) Graduation Requirements

VI.a) Graduation Requirements for Associate students (Applied Science and Engineering)

The College of Engineering and Technology requires that all the students enrolled in an Associate of Engineering or Associate of Applied Science degree fulfill all the following requirements for graduation:

(a) Have been admitted to an NNMC Associate Program in Engineering;
(b) Have fulfilled all NNMC's graduation requirements;

VI.b) Graduation Requirements for Baccalaureate students

The College of Engineering and Technology requires that all Baccalaureate students fulfill the following requirements for graduation:

(a) Have been admitted to an NNMC Bachelor Program in Engineering;
(b) Have fulfilled all NNMC's graduation requirements;
(c) Have a minimum of 100 hrs. of community/college service (**).

(**)Mentoring, tutoring, internships and research projects are some examples of opportunities for the students to achieve this requirement. Before students begin working on any activity towards this requirement, they need the approval of their academic advisor. Students can discuss with their academic advisor and/or the Dean about these and other community service opportunities.

VI.c) Graduation Requirements for Post Baccalaureate students

The College of Engineering and Technology requires that all Post Baccalaureate students fulfill the following requirements for graduation:

(a) Have fulfilled all NNMC's graduation requirements;
(b) Have a minimum overall GPA of 3.0 for graduation and no more than one C+ or below grade in the courseware.

V) Degrees Offered at the College of Engineering and Technology

V.a) Certificates and Associate of Applied Science Degrees

Associate of Applied Science ELECTRICAL TECHNOLOGY

This program prepares you for the more technical aspects of the electrician's trade with emphasis on jobs available in the government sector.

GENERAL EDUCATION (27 CR)

Area I. Communications (9 cr)

ENG	111	English Composition I (3)
ENG	116	Technical Writing (3)
SPCH	130	Public Speaking (3)

Areas II and III. Mathematics/Computers/Laboratory Science (9 cr)

ENGR	110L	Introduction to Engineering (2)
ENGR	115	Basic Math for Engineering Applications (4)

Choose one of the following electives:

BCIS	102	Computer Literacy (3)
EECE	111	Introduction to Web Design (3)

Area IV. Social/Behavioral Sciences (3 cr)

Elective (3)
You must select courses from the approved list in the Catalog for GenEd

Area V. Humanities and Fine Arts (3 cr)

Elective (3)
You must select courses from the approved list in the Catalog for GenEd

Area VI. First Year Experience (3 cr)

FYE	101	Freshman Year Experience (3)

PROGRAM REQUIREMENTS (33 CR)

Electrical (33)

ELEC	110	Introduction to Solar Electricity (1)
ELEC	110L	Introduction to Solar Electricity Lab (2)
ELEC	140	Electrical Theory I (3)
ELEC	141	Electrical Code I (3)
ELEC	142L	Residential Wiring Lab (6)
ELEC	150	Electrical Theory II (3)
ELEC	151	Electrical Code II (3)
ELEC	152L	Commercial Wiring Lab (6)
ELEC	160	Motor Controls (3)
ELEC	160L	Motor Controls Lab (3)

TOTAL CREDITS: 60

SUGGESTED SEQUENCE OF COURSES

First Semester (14 cr)

ENG	111	English Composition I (3)
FYE	101	Freshman Year Experience (3)

ENGR 110L Introduction to Engineering (2)
ELEC 140 Electrical Theory I (3)
ELEC 110 Introduction to Solar Energy (1)
ELEC 110L Introduction to Solar Energy Lab (2)

Second Semester (16 cr)
ENGR 115 Basic Math for Engineering Apps (4)
ELEC 150 Electrical Theory II (3)
ELEC 141 Electrical Code I (3)
ELEC 142L Residential Wiring Lab (6)

Third Semester (15 cr)
Elective Computer courses (3)
HFA Elective (3)
ELEC 151 Electrical Code II (3)
ELEC 152L Commercial Wiring Lab (6)

Fourth Semester (15 cr)
SPCH 130 Public Speaking (3)
ELEC 160 Motors Controls (3)
ELEC 160L Motors Controls Lab(3)
SBS Elective (3)
ENG 116 Technical Writing (3)

Certificate ELECTRICAL TECHNOLOGY

This program prepares you for entry-level employment as an electrician's helper or an apprentice electrician. In addition, it prepares you to take the state examination for licensure as a journeyman electrician. You must attend on a full-time basis.

GENERAL EDUCATION (7-8 CR)

Communications (4 cr)
ENG 108N Basic Composition I (4)

Mathematics (3-4 cr)
MATH 100N (4) or a higher level math course (3)

PROGRAM REQUIREMENTS (24 CR)
ELEC 140 Introduction to Electrical Theory (3)
ELEC 141 Introduction to Electrical Code (3)
ELEC 142L Residential Wiring Lab (6)
ELEC 150 Electrical Theory (3)
ELEC 151 Electrical Code (3)
ELEC 152L Commercial Wiring Lab (6)

TOTAL CREDITS: 31-32

Associate of Applied Science RENEWABLE ENERGY

This program will provide you with the skills necessary to enter environmental fields – the renewable energy, alternative technology, and construction industries. You will be capable of entering at supervisory or management internship levels or have the skills to establish a small, related business.

GENERAL EDUCATION (28 CR)

Area I. Communications (9 cr)

ENG 111 English Composition I (3)
ENG 116 Technical Writing (3)
SPCH 130 Public Speaking (3)

Areas II and III. Mathematics/Computers/Laboratory Science (10 cr)

ENGR 110 Introduction to Engineering s (2)
ENGR 120L Introduction to Mathematics for Engineering Applications (4)
Choose one of the following electives:
PHYS 121/L Applied Physics I with lab (4)
PHYS 215L Engineering Physics I with lab (4)

Area IV. Social/Behavioral Sciences (3 cr)

Elective (3)
You must select courses from the approved list in the Catalog for GenEd

Area V. Humanities and Fine Arts (3 cr)

Elective (3)
You must select courses from the approved list in the Catalog for GenEd

Area VI. First Year Experience (3 cr)

FYE 101 Freshman Year Experience (3)

PROGRAM REQUIREMENTS (33-35 CR)

General (3 cr)

RE 103 Renewable Energy Introduction and Overview (3)

Solar Heating (8 cr)

ADOB 107 Passive Solar Heating (3)
RE 108 Active Solar Heating (3)
RE 108L Active Solar Heating Lab (2)

Renewable Electric and Electronics (20 cr)

ELEC 100/L Introduction to Solar Electricity/Lab (3)
ELEC 140 Electrical Theory I (3)
ELEC 141 Electrical Code I (3)
ELEC 150 Electrical Theory II (3)
ELEC 151 Electrical Code II (3)
ELEC 190 Solar and Wind Systems in the Electric Code (2)
RE 111 Beginning Photovoltaic Installation (3)

Renewable Electric and Electronics Electives (2-4)

Choose one of the following electives:
RE 127 Geothermal Systems for Heat and Power (4)
RE 128 Biomass Systems for Heat, Power, and Cogeneration (4)
RE 129 Trends and Emerging Energy Sources (2)
RE 160 Renewable Electric Power Systems (3)
RE 207 Wind Electric System Design and Installation (4)
RE 208 Photovoltaic System Design and Installation (4)
RE 212 Advanced Photovoltaic Installation (3)

TOTAL CREDITS: 61-63

SUGGESTED SEQUENCE OF COURSES

First Semester (14 cr)

ENG	111	English Composition I (3)
FYE	100	Freshman Year Experience (3)
ENGR	110L	Introduction to Engineering (2)
ELEC	140	Electrical Theory I (3)
RE	103	Renewable Energy Introduction and Overview (3)

Second Semester (16 cr)

ELEC	110	Introduction to Solar Energy (1)
ELEC	110L	Introduction to Solar Energy Lab (2)
ENGR	115	Basic Math for Engineering Apps (4)
ELEC	150	Electrical Theory II (3)
ELEC	141	Electrical Code I (3)
ADOB	107	Passive Solar Heating (3)

Third Semester (15 cr)

ELEC	151	Electrical Code II (3)
ELEC	190	Solar and Wind Systems in Electric Code (2)
ENG	116	Technical Writing (3)
PHYS		Elective (4)
RE	111	Beginning Photovoltaic Installation (3)

Fourth Semester (16-18 cr)

SPCH	130	Public Speaking (3)
RE		Elective (2-4)
RE	108	Active Solar Heating (3)
RE	108L	Solar Energy Lab (2)
SBS		Elective (3)
HFA		Elective (3)

V.b) Associate of Engineering Degrees

Associate of Engineering in INFORMATION ENGINEERING TECHNOLOGY

The curriculum for the Associate in Engineering (AEng) in Information Technology is designed for those engineering students who intend to launch a career in the design, installation, maintenance, and repair of computer networks used for critical data entry, transfer, retrieval, and management. Coursework in the program is practice-oriented and prepares students to work in a variety of computer-intensive environments, such as technical organizations, small or large businesses, product design or manufacturing companies, and data-directed services. The breadth of training in hardware, software, troubleshooting equipment, and other computer tools will enable the graduate to work in a variety of roles in such occupations as network designer, network support and administrator, project manager, data applications or computer communications engineer, test and integration manager or technologist in business applications. The graduate of this curriculum could be a computer network specialist, and will be broadly versed in mathematics, physics, computer science, and business fundamentals.

The program objectives are the following:

1. Graduates will be situated in growing entry-level careers involving support of Information Technology Systems.
2. Graduates will have demonstrated involvement in high-level technical roles.

Completion of this program should result in the following student outcomes:

1. An ability to apply knowledge of mathematics, science, and engineering
2. An ability to function on multidisciplinary teams
3. An ability to communicate effectively
4. Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

5. A knowledge of contemporary issues
6. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

GENERAL EDUCATION (33 CR)

Area I. Communications (9 cr)

ENG	111	English Composition I (3)
ENG	116	Technical Writing (3)
SPCH	130	Public Speaking (3)

Area II. Mathematics (7 cr)

MATH	145	Introduction to Probability & Statistics (3)
ENGR 120		Introductory Math for Engineering Applications (4)

Area III. Laboratory Sciences (8 cr)

PHYS	215/L	Engineering Physics I with lab (4)

Elective Laboratory Science (4)

You must select a course from the following list*:*

ASTR	110/L	Intro to Astronomy with Lab (4)
PHYS	122/L	Applied Physics II with lab (4)
PHYS	215/L	Engineering Physics I with lab (4)
PHYS	216/L	Engineering Physics II with lab (4)
CHEM	121/L	General Chemistry I with Lab (4)
ES	112/L	Introduction to Environmental Science with Lab (4)
BIOL	110/L	Current Topics in Biology with Lab (4)
GEOL	101/L	Physical Geology with Lab (4)

Area IV. Social/Behavioral Sciences (3 cr)

ECON	201	Microeconomics (3)

Area V. Humanities and Fine Arts (3 cr)

Elective (3)	Electives in the General Education Common Core are to be chosen from Area IV

Area VI. First Year Experience (3 cr)

FYE	101	Freshman Year Experience (3)

PROGRAM REQUIREMENTS (29 CR)

Electrical, Electronic, and Computer Engineering (24 cr)

EECE	105L	Microcomputer Systems (3)
EECE	111	Introduction to Web Programming (3)
EECE	132	Computer Networks I (3)
EECE	152L	Computer Programming I (3)
EECE	230	Introduction to Routing and Switching (3)
EECE	231L	Intermediate Programming I (3)
CS/EECE/IT		Elective (6)

Information Technology (3 cr)

IT	250	Introduction to Databases (3)

Support Technologies (2 cr)

ENGR	110L	Introduction to Engineering (2)

TOTAL CREDITS: 62

SUGGESTED SEQUENCE OF COURSES

First Semester (15 crs)

FYE	101	Freshman Year Experience (3)
ENGR	110L	Introduction to Engineering (2)
EECE	111	Introduction to Web Programming (3)
ENGR	120L	Introductory Math for Engineering Applications (4)
EECE	132	Computer Networks I (3)

Second Semester (16 crs)

ENG	111	English Composition I (3)
EECE	152L	Computer Programming I (3)
PHYS	215/L	Engineering Physics I with lab (4)
EECE	230	Introduction to Routing and Switching (3)
EECE/CS/IT		Elective (3)

Third Semester (16 crs)

EECE	105L	Microcomputer Systems (3)
ENG	116	Technical Writing (3)
MATH	145	Introduction to Probability and Statistics (3)
IT	250	Introduction to Databases (3)
Elective		Laboratory Science (4)

Fourth Semester (15 crs)

SPCH	130	Public Speaking (3)
ECON	201	Microeconomics (3)
EECE	231	Intermediate Programming (3)
CS/EECE/IT		Elective (3)
HFA		Elective (3)

Associate of Engineering PRE-ENGINEERING

This program will prepare you for a bachelor's degree in engineering. You will obtain both a general background in mathematics and the physical sciences, and an introduction to the concepts and methods of engineering. This program is not a professional degree and does not prepare you for specific job opportunities. It does, however, provide a broad educational foundation on which to build a career through additional education or work experience.

The program objectives are the following:

1. Graduates will have demonstrated knowledge and skills to pursue an engineering bachelor program.
2. Graduates will have demonstrated involvement in high-level technical roles.

Completion of this program should result in the following student outcomes:

1. An ability to apply knowledge of mathematics, science, and engineering
2. An ability to function on multidisciplinary teams
3. An ability to communicate effectively
4. The broad education necessary for understanding the impact of engineering solutions in a global, economic, environmental, and societal context
5. Knowledge of contemporary issues
6. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

GENERAL EDUCATION (38 CR)

Area I. Communications (9 cr)

ENG	111	English Composition I (3)
ENG	116	Technical Writing (3)
SPCH	130	Public Speaking (3)

Area II. Mathematics (12 cr)

ENGR	120L	Introductory Mathematics for Engineering Applications (4)

MATH 162E Calculus I (4)
MATH 163E Calculus II (4)

Area III. Laboratory Sciences (8 cr)

PHYS 215/L Engineering Physics I with lab (4)
Select one class from the following list:
PHYS 216/L Engineering Physics II with lab (4)
CHEM 121/L General Chemistry with lab (4)
Other Science Class with the approval of the advisor (4)

Area IV. Social/Behavioral Sciences (3 cr)

Select one class from the following list:
ECON 201 Microeconomics (3)
ECON 200 Macroeconomics (3)

Area V. Humanities and Fine Arts (3 cr)

Elective (3) Electives in the General Education Common Core are to be chosen from Area IV

Area VI. First Year Experience (3 cr)

FYE 100 Freshman Year Experience (3)

PROGRAM REQUIREMENTS (22 CR)

Engineering (22 cr)

ENGR 110L Introduction to Engineering (2)
EECE 152L Computer Programming I (3)
DRFT 100 Computer Aided Drafting I (4)
MET 201 Applied Mechanics (3)
EET 200 Electrical Systems I (3)
EET 200L Electrical Systems Lab (1)
Engineering/Technical Elective (6)

TOTAL CREDITS: 60

SUGGESTED SEQUENCE OF COURSES

First Semester (16 crs)

ENGR 120 Introductory Mathematics for Engineering Applications (4)
DRFT 100 Computer Aided Drafting I (4)
ENGR 110 Introduction to Engineering (2)
Engineering/Technical Elective (3)
FYE 100 Freshman Year Experience (3)

Second Semester (15 crs)

EECE 152L Computer Programming I (3)
ENG 111 English Composition I (3)
Engineering/Technical Elective (3)
HFA Elective (3)
ECON 201/200 Microeconomics or Macroeconomics (3)

Third Semester (15 crs)

MATH 162E Calculus I (4)
PHYS 215/L Engineering Physics I with Lab (4)
SPCH 130 Public Speaking (3)
EET 200 Electrical Systems I (3)
EET 200L Electrical Systems I Lab (1)

Fourth Semester (14 crs)

Science/Lab		Elective (4)
MATH	163E	Calculus II (4)
MET	201	Applied Mechanics I (3)
ENG	116	Technical Writing (3)

Associate of Engineering in SOFTWARE ENGINEERING

The curriculum in the Associate Degree in Engineering (AEng) in Software Engineering is designed for those who intend to launch a career in the testing, installation, and maintenance of computer software modules and systems. Coursework in the program is hands-on oriented and prepares students to work in a variety of computer-intensive environments that involve engineering support: technical organizations, small or large businesses, manufacturing companies, and data-directed services.

The breadth of training in hardware, software, troubleshooting equipment, and other computer tools will enable the graduate to work in a variety of roles in such occupations as software technician, computer systems technician, data applications or computer technician, or as a test and integration assistant. Graduates of this program will be a software engineering technician versed in mathematics, physics, computer science, software development, and business fundamentals.

The program objectives are the following:

1. Graduates will have demonstrated knowledge and skills to pursue an engineering bachelor program.
2. Graduates will have demonstrated involvement in high-level technical roles.

Completion of this program should result in the following student outcomes:

1. An ability to apply knowledge of mathematics, science, and engineering
2. An ability to function on multidisciplinary teams
3. An ability to communicate effectively
4. Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
5. A knowledge of contemporary issues
6. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

GENERAL EDUCATION (33 CR)

Area I. Communications (9 cr)

ENG	111	English Composition I (3)
ENG	116	Technical Writing (3)
SPCH	130	Public Speaking (3)

Area II. Mathematics (7 cr)

MATH	145	Introduction to Probability & Statistics (3)
ENGR	120L	Introductory Math for Engineering Applications (4)

Area III. Laboratory Sciences (8 cr)

PHYS	215/L	Engineering Physics I with lab (4)

Elective Laboratory Science (4)

You must select a course from the following list*:*

ASTR	110/L	Intro to Astronomy with Lab (4)
PHYS	122/L	Applied Physics II with lab (4)
PHYS	215/L	Engineering Physics I with lab (4)
PHYS	216/L	Engineering Physics II with lab (4)
CHEM	121/L	General Chemistry I with Lab (4)
ES	112/L	Introduction to Environmental Science with Lab (4)
BIOL	110/L	Current Topics in Biology with Lab (4)

GEOL 101/L Physical Geology with Lab (4)

Area IV. Social/Behavioral Sciences (3 cr)

ECON 201 Microeconomics (3)

Area V. Humanities and Fine Arts (3 cr)

Elective (3) Electives in the General Education Common Core are to be chosen from Area IV

Area VI. First Year Experience (3 cr)

FYE 101 Freshman Year Experience (3)

PROGRAM REQUIREMENTS (29 CR)

Computer Science (6 cr)

CS 201 Mathematical Foundations of Computer Science (3)
IT 250 Introduction to Databases (3)

Electrical, Electronic, and Computer Engineering (21 cr)

EECE 105L Microcomputer Systems (3)
EECE 111 Introduction to Web Programming (3)
EECE 132 Computer Networks I (3)
EECE 152L Computer Programming I (3)
EECE 231L Intermediate Programming I (3)
CS/EECE/IT Elective (6)

Support Technologies (2 cr)

ENGR 110L Introduction to Engineering (2)

TOTAL CREDITS: 62

SUGGESTED SEQUENCE OF COURSES

First Semester (15 crs)

FYE 101 Freshman Year Experience (3)
ENGR 110L Introduction to Engineering (2)
EECE 111 Introduction to Web Programming (3)
ENGR 120L Introductory Math for Engineering Applications (4)
EECE 132 Computer Networks I (3)

Second Semester (16 crs)

EECE 105L Microcomputer Systems (3)
ENG 111 English Composition I (3)
EECE 152L Computer Programming I (3)
PHYS 215/L Engineering Physics I with lab (4)
EECE/CS/IT Elective (3)

Third Semester (16 crs)

ENG 116 Technical Writing (3)
MATH 145 Introduction to Probability and Statistics (3)
CS 201 Mathematical Foundations of Computer Science (3)
IT 250 Introduction to Databases (3)
Elective Laboratory Science (4)

Fourth Semester (15 crs)

SPCH 130 Public Speaking (3)
ECON 201 Microeconomics (3)

EECE	231	Intermediate Programming (3)
EECE/CS/IT		Elective (3)
HFA		Elective (3)

V.c) Bachelor Degrees

Bachelor INFORMATION ENGINEERING TECHNOLOGY

The Bachelor of Engineering in Information Engineering Technology Program is accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET, *www.abet.org*. Accreditation is proof that the quality of an academic program meets the standards of the profession.

The curriculum of the Bachelor of Engineering (BEng) in Information Engineering Technology is designed for those students who intend to launch a career in the design, installation, maintenance, and repair of computing technologies. Coursework in the program is practice-orientated and prepares students to work in a variety of computer-intensive environments, such as technical organizations, small or large businesses, product design or manufacturing companies, and data-directed services. The breadth of training in hardware, software, troubleshooting equipment, and other computer tools will enable the graduate to work in a variety of roles in such environments as software, network, database, and web designer. Additionally, the graduate will have the ability to work as network manager and administrator, project manager, applications developer, test and integration manager and technologist in business applications. The graduate of this curriculum will be versed in mathematics, physics, computer science, and business fundamentals, giving him/her the fundamental knowledge for further graduate studies in Computer Science, Computer Engineering, or Telecommunication Systems.

Failure to maintain an overall GPA of 2.00 or better in all coursework will be sufficient cause for being dropped from the program.

The program objectives are the following:

1. Graduates will be situated in growing careers involving design, development, and support of Information Technology Systems.
2. Graduates will perform effectively individually and in teams.
3. Graduates will have demonstrated involvement in high-level technical and leadership roles.
4. Graduates will have accumulated technical expertise to remain globally competitive.

Completion of this program should result in the following student outcomes:

1. An appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines.
2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.
3. An ability to conduct, analyze and interpret experiments, and apply experimental results to improve processes.
4. An ability to apply creativity in the design of systems, components, or processes appropriate to program educational objectives.
5. An ability to function effectively on teams.
6. An ability to identify, analyze, and solve technical problems.
7. An ability to communicate effectively.
8. A recognition of the need for, and an ability to, engage in lifelong learning.
9. An ability to understand professional, ethical, and social responsibilities.
10. A respect for diversity and knowledge of contemporary professional, societal, and global issues.
11. A commitment to quality, timeliness, and continuous improvement.
12. The application of Computer and network hardware, operating systems, system and network administration, programming languages, applications software, and databases in the building, testing, operation, and maintenance of hardware and software systems.
13. The application of electrical, electronic, telecommunications, and digital signal propagation fundamentals in the building, testing, operation and maintenance of hardware and software systems.
14. The ability to design, implement, maintain, and provide for the security of facilities involved with the processing and transfer of information.
15. The ability to apply project management techniques to facilities that process and transfer information.

16. The ability to apply discrete mathematics, and probability and statistics in the support of facilities that process and transfer information.

Students are advised not to attempt upper division coursework (300 and 400-level classes) unless they have earned a GPA of 2.50 or better in all IT, CS, and CT coursework taken at the 100 and 200-level.

GENERAL EDUCATION (38 CR)

Area I. Communications (9 cr)

ENG 111 English Composition I (3)
ENG 116 Technical Writing (3)
SPCH 130 Public Speaking (3)

Area II. Mathematics (3 cr)

MATH 145 Introduction to Probability and Statistics (3)

Area III. Laboratory Sciences (8 cr)

PHYS 215/L Engineering Physics I with lab (4)
Elective Laboratory Science (4)
You must select a course from the following list*:*
ASTR 110/L Intro to Astronomy with Lab (4)
PHYS 122/L Applied Physics II with lab (4)
PHYS 216/L Engineering Physics II with lab (4)
CHEM 121/L General Chemistry I with Lab (4)
ES 112/L Introduction to Environmental Science with Lab (4)
BIOL 110/L Current Topics in Biology with Lab (4)
GEOL 101/L Physical Geology with Lab (4)

Area IV. Social/Behavioral Sciences (6–9 cr)

ECON 201 Microeconomics (3)
Elective (3-6)* Electives in the General Education Common Core are to be chosen from Area IV

Area V. Humanities and Fine Arts (6–9 cr)

Second Language (3)
Electives (3-6) Electives in the General Education Common Core are to be chosen from Area V

Area VI. First Year Experience (3 cr)

FYE 101 Freshman Year Experience (3)

SUPPORT COURSES (8 CR)

MATH 162E Calculus I (4)
MATH 163E Calculus II (4)

PROGRAM REQUIREMENTS (77 CR)

Computer Science (3)

CS 201 Math Foundations of Computer Science (3)

Electrical, Electronic, and Computer Engineering (37 cr)

EECE 105L Microcomputer Systems I (3)
EECE 111 Introduction to Web Programming (3)
EECE 132 Computer Networks I (3)
EECE 152L Computer Programming I (3)
EET 200/L Electrical Systems I with Lab (4)
EECE 230 Introduction to Routing and Switching (3)

EECE 231L Intermediate Programming (3)
EECE 329 Human Computer Interaction (3)
EECE 330 Computer Networks II (3)
EECE 351 Advanced Programming I (3)
EECE 355 Web Engineering (3)
EECE 440 Advanced Computer Networks (3)

Information Technology (15 cr)

IT 250 Introduction to Databases (3)
IT 350 Database Management (3)
IT 410 Information Assurance/Security (3)
IT 490 IT Capstone I (3) (WIC)
IT 491 IT Capstone II (3)

Business (4 cr)

ENGR 480 Engineering Management and Project Management (4)

Support Technologies (18 cr)

ENGR 110L Introduction to Engineering (2)
ENGR 120L Introductory Math for Engineering Applications (4)
Electives EECE/CS/IT/MATH/ENGR courses (at least 9 upper division) (12)

TOTAL CREDITS: 123

SUGGESTED SEQUENCE OF COURSES

HFA = Humanities & Fine Arts (Area V)
SBS = Social/Behavioral Science (Area IV)

First Semester (15 crs)

FYE 101 Freshman Year Experience (3)
ENGR 110L Introduction to Engineering (2)
EECE 111 Introduction to Web Design (3)
ENGR 120L Introductory Math for Engineering Applications (4)
EECE 132 Computer Networks I (3)

Second Semester (17 crs)

ENG 111 English Composition I (3)
EECE 152L Computer Programming I (3)
EET 200 Electrical Systems I with Lab (4)
PHYS 215/L Engineering Physics I with lab (4)
EECE 230 Introduction to Routing and Switching (3)

Third Semester (16 crs)

EECE 105L Microcomputer Systems (3)
ENG 116 Technical Writing (3)
MATH 145 Introduction to Probability and Statistics (3)
IT 250 Introduction to Databases (3)
Elective Laboratory Science (4)

Fourth Semester (15 crs)

SPCH 130 Public Speaking (3)
ECON 201 Microeconomics (3)
EECE 231 Intermediate Programming (3)
EECE/IT/CS/MATH/ENGR Elective lower or upper division (3)
HFA Elective (3)

Fifth Semester (16 crs)

MATH	162	Calculus I (4)
CS	201	Math Foundations of Computer Science (3)
EECE	329	Human Computer Interaction (3)
EECE	330	Computer Networks II (3)
IT	350	Database Management (3)

Sixth Semester (16 crs)

MATH	163	Calculus II (4)
EECE	350	Advanced Programming (3)
EECE	355	Web Engineering (3)
ENGR	480	Engineering Management and Project Management (3)

EECE/CS/IT/MATH/ENGR Elective 3XX/4XX (3)

Seventh Semester (16 crs)

EECE	440	Advanced Computer Networks (3)
IT	490	Capstone I (4)
SBS		Elective (3)

Second Language (3)

EECE/CS/IT/MATH/ENGR Elective 3XX/4XX (3)

Eighth Semester (12 crs)

IT	410	Information Assurance/Security (3)
IT	491	Capstone II (3)
SBS or HFA		Elective (3)

EECE/CS/IT/MATH/ENGR Elective 3XX/4XX (3)

Bachelor ELECTROMECHANICAL ENGINEERING TECHNOLOGY

The Bachelor of Engineering in Electromechanical Engineering Technology (BEng. EMET) program is offered in response to a growing demand from industrial and consulting companies for engineering staff members with a wide range of technical knowledge. At Northern, this program will provide a clear pathway towards a bachelor degree for students completing Career and Technical Education associates in Drafting, Electricity and Renewable Energy and Pre-engineering. The primary aim of the BEng. EMET program is to provide graduates with the knowledge and skills necessary to apply current methods and technology to the development, design, operation, and management of electro-mechanical systems, particularly in those industries where automated systems are prevalent. The program will offer a concentration in Solar Energy and will provide the knowledge and skills for this two growing technical fields. Students are advised not to attempt upper division coursework (300 and 400-level classes) unless you have earned a GPA of 2.5 or better in all coursework taken at the 100 and 200-level. Failure to maintain an overall GPA of 2.0 or better in all coursework will be sufficient cause for being dropped from the program.

The program objectives are the following:

1. Graduates will be situated in growing careers involving design, development, and support of Electro-Mechanical Engineering Systems.
2. Graduates will demonstrate involvement in significant technical roles and beginning leadership roles.
3. Graduates will perform effectively both individually and in teams and demonstrate oral and written communication skills in the working environment.
4. Graduates will continue personal and professional growth to remain globally competitive and develop a beginning understanding of business and ethical aspects of work.
5. Graduates will demonstrate an ability to creatively use science and technology to solve problems.

Completion of this program should result in the following student outcomes:

1. An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
2. An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
3. An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply

experimental results to improve processes;
4. An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
5. An ability to function effectively as a member or leader on a technical team;
6. An ability to identify, analyze, and solve broadly-defined engineering technology problems;
7. An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
8. An understanding of the need for and an ability to engage in self-directed continuing professional development;
9. An understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
10. A knowledge of the impact of engineering technology solutions in a societal and global context;
11. A commitment to quality, timeliness, and continuous improvement;
12. Use computer-aided drafting or design tools to prepare graphical representations of electromechanical systems;
13. Use circuit analysis, analog and digital electronics, basic instrumentation, and computers to aid in the characterization, analysis, and troubleshooting of electromechanical systems;
14. Use statics, dynamics (or applied mechanics), strength of materials, engineering materials, engineering standards, and manufacturing processes to aid in the characterization, analysis, and troubleshooting of electromechanical systems;
15. Use appropriate computer programming languages for operating electromechanical systems;
16. Use electrical/electronic devices such as amplifiers, motors, relays, power systems, and computer and instrumentation systems for applied design, operation, or troubleshooting electromechanical systems;
17. Use advanced topics in engineering mechanics, engineering materials, and fluid mechanics for applied design, operation, or troubleshooting of electromechanical systems.
18. Use basic knowledge of control systems for the applied design, operation, or troubleshooting of electromechanical systems;
19. Use differential and integral calculus, as a minimum, to characterize the static and dynamic performance of electromechanical systems; and
20. Use appropriate management techniques in the investigation, analysis, and design of electromechanical systems.

PROGRAM REQUIREMENTS

Area I. Communications (9 cr)

ENG	111	English Composition I (3)
ENG	116	Technical Writing (3)
SPCH	130	Public Speaking (3)

Area II. Mathematics (3 cr)

MATH	162E	Calculus I For Engineers (4)

Area III. Laboratory Sciences (8 cr)

PHYS	215/L	Engineering Physics I with lab (4)

Elective Laboratory Science (4)

Select one class from the following list:

PHYS	216/L	Engineering Physics II with lab (4)

OR

CHEM	121/L	General Chemistry I with Lab (4)

OR

Other Science Class with the approval of the advisor (4)

Area IV. Social/Behavioral Sciences (6–9 cr)

ECON	201	Microeconomics (3)
Elective (3-6)*		Electives in the General Education Common Core are to be chosen from Area IV

Area V. Humanities and Fine Arts (6–9 cr)

Second Language (3)	
Electives (3-6)	Electives in the General Education Common Core are to be chosen from Area V

Area VI. First Year Experience (3 cr)

FYE 101 Freshman Year Experience (3)

SUPPORT COURSES (8 CR)

ENGR 120L Introductory Mathematics for Engineering Applications (4
MATH 163E Calculus II For Engineers (4)

PROGRAM REQUIREMENTS (76 CR)

Electromechanical Engineering Technology Courses (64)

ENGR 110L Introduction to Engineering (2
DRFT 100 Computer Aided Drafting I (4)
EECE 152 Computer Programming I (3)
MET 201 Applied Mechanics I (3)
MET 301 Applied Mechanics II (2)
MET 302 Strength and Properties of Materials (3)
MET 310 Manufacturing Processes and Automation (3)
EET 200/L Electrical Systems I with Lab (4)
EET 300/L Electrical Systems II with Lab (4)
EET 400/L Control Systems and Instrumentation with Lab (4)
EMET 400 Advanced Electro-Mechanical Design (3)
MET 420 Thermal-Fluid Engineering (4)
ENGR 480 Engineering Management and Project Management (4)
EMET 490 Capstone I (3)
EMET 491 Capstone II (3)
Lower/Upper Division Engineering or Technical Elective (15)

Solar Energy Concentration (12)

MET 421 Heat Transfer (3)
ME 403 Solar Thermal Applications (3)
EECE 453 Electric Energy Storage Devices (3)
EECE 472 Photovoltaic Devices (3)

TOTAL CREDITS: 123
SUGGESTED SEQUENCE OF COURSES

First Semester (16 crs)

ENGR 120L Introductory Mathematics for Engineering Applications (4)
ENGR 110L Introduction to Engineering (2)
DRFT 100 Computer Aided Drafting I (4)
Elective Lower Division Engineering or Tech (3)
FYE 101 Freshman Year Experience (3)

Second Semester (15 crs)

ENG 111 English Composition I (3)
EECE 152L Computer Programming I (3)
Elective Lower Division Engineering or Tech (3)
Elective Lower Division Engineering or Tech (3)
Elective Lower/Upper Division Engineering or Tech (3)

Third Semester (15 crs)

MATH 162E Calculus I for Engineers (4)
PHYS 215/L Engineering Physics I with Lab (4)
EET 200/L Electrical Systems I with Lab (4)
Elective Lower/Upper Division Engineering or Tech (3)

Fourth Semester (17 crs)

MATH	163E	Calculus II for Engineers (4)
MET	201	Applied Mechanics I (3)
ENG	116	Technical Writing (3)
EET	300/L	Electrical Systems II with Lab (4)
SBS		Elective (3)

Fifth Semester (16 crs)

EET	400/L	Control Systems and Instrumentation with Lab (4)
MET	302	Strength and Properties of Materials (3)
MET	301	Applied Mechanics II (2)
SPCH	130	Public Speaking (3)
Science Elective (4)		

Sixth Semester (17 crs)

MET	420	Thermal-Fluid Engineering (4)
HFA		Elective (3)
EMET	400	Advanced Electro-Mechanical Design (3)
MET	310	Manufacturing Processes and Automation (3)
ENGR	480	Engineering Management and Project Management (4)

Seventh Semester (15 crs)

Second Language (3)

EMET	490	Capstone I (3)
EECE	472	PV Devices (3)
MET	421	Heat Transfer (3)
Economics Elective		(3)

Eight Semester (12 crs)

ME	403	Solar Thermal Applications (3)
EECE	453	Electric Energy Storage Devices (3)
EMET	491	Capstone II (3)
SBS		Elective (3)

V.d) Post Baccalaureate Certificate

Post Baccalaureate Certificate in Information Engineering Technology

The curriculum for the Post Baccalaureate Certificate in Engineering in Information Technology is a practice-oriented professional program, meant to extend students' undergraduate education. The program will provide high-quality and affordable education to engineers who want to master their knowledge in networks used for critical data entry, transfer, retrieval, and management of information systems. Coursework in the program is practice-oriented and prepares students to work as leaders in a variety of computer-intensive environments, such as technical organizations, small or large businesses, product design or manufacturing companies, and data-directed services. Coursework in the program consists of gateway courses towards pursuit of a master's program in the field.

Completion of this program should result in the following student outcomes:

1. Graduates will have gained the theoretical and hands-on experience needed to pursue a Master's Program in the field.
2. Graduates will encompass a deeper understanding of management solutions for professionals in information systems and information technology.
3. Graduates will excel in highly technical leadership roles.

Completion of this program should result in the following student outcomes:

1. An ability to apply knowledge of Information Engineering Technologies.

2. An ability to function on multidisciplinary teams.
3. An ability to communicate effectively.
4. The ability to design, implement, provide, and supervise the security of facilities involved with the processing and transfer of information.

PROGRAM REQUIREMENTS

Electrical, Electronic, and Computer Engineering (3)

EECE	547	Routing and Switching (3)

Information Technology (9)

IT	510	Information Assurance and Security (3)
IT	530	Network Administration (3)
IT	599	Topics in IT (3)

Support Technology (3)

ENGR	578	Engineering Ethics (3)

TOTAL CREDITS: 15

V.e) Course Descriptions.

COMPUTER SCIENCE (CS)

201 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE You will study the formal mathematical concepts of computer science, including such topics as elementary logic, induction, algorithmic processes, graph theory, and models of computation. (Fall) Prerequisite: EECE 231L. (3, 3T+0S)

DRAFTING (DRFT)

100 COMPUTER AIDED DRAFTING I You will develop basic drafting skills using computer-aided drafting software (AutoCAD), including lettering, scales, line types, line weight, 2- and 3-view orthographic projection, dimensioning, and sectioning. (4, 3T+1S)

ELECTRICAL, ELECTRONIC, AND COMPUTER ENGINEERING (EECE)

105L MICROCOMPUTER SYSTEMS In this introductory course on microcomputers, you will study the characteristics and nature of modern-day computer systems, including hardware and software components. Among the principal software components, the course describes the roll of operating systems, and then focuses on Linux. The course provides the background knowledge and skills in Linux you will require for any type of engineering, technology or computer science related career. The course also includes an introduction to scripting languages and their benefits to automate operating systems tasks. (Fall, Spring) (3, 2T+1L)

111 INTRODUCTION TO WEB PROGRAMMING In this course, you will be introduced to web design and to the standards and languages for the Web. You will gain hands-on experience on design issues specific to the Web, learn webpage layout, and effective navigation. You will learn the process of webpage publishing and develop an understanding of the technologies that support the Web. No prerquisite. (3, 2T, +1S).

132 COMPUTER NETWORKS I Students will learn both practical and conceptual skills that build the foundation of networking. They will examine the OSI and TCP/IP layers in detail to understand their functions and services. Students will become familiar with the various network devices, network addressing schemes, and types of media used to carry data across the network. They will gain experience designing and deploying inter-networks of WAN and LANS using static routing. (3, 2T+1S)

152L COMPUTER PROGRAMMING This is an introductory programming class. No programming experience is assumed for students taking this course. Topics include problem solving, program design, implementation, testing and basic object-oriented concepts including classes, object, and encapsulation. (Fall and Spring) (3, 2T+1L)

203L CIRCUIT ANALYSIS I You will study basic electrical elements and sources; energy and power; Ohm's and Kirchhoff's Laws; resistive networks, node and loop analysis; network theorems; first and second order circuits; sinusoidal sources and complex representations; impedance, phasors' complex power; and three-phase circuits. Prerequisite: PHYS 216/L. (Fall) (3, 2T+1L)

230 INTRODUCTION TO ROUTING AND SWITCHING This course describes the architecture, components, and operations of routers and switches. Students learn how to design Local Area Networks (LANs), Wide Area Networks (WANs), and inter-networks using modern intermediate devices, including Layer 2 and multi-layer switches and routers. Be the end of this course, students are able to design and deploy networks and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. Prerequisite: EECE 132. (3, 3T+0L)

231L INTERMEDIATE PROGRAMMING This class teaches hoe to write medium complex computer programs that make use of structured decomposition, basic data structures, strings, recursion, files and dynamic memory. Knowledge of basic programming concepts is assumed. Prerequisite: EECE 152L (3, 2T+1L)

329 HUMAN COMPUTER INTERACTION This course covers the development of IT products considering the human-computer interaction, including human factors, performance analysis, usability studies, environment, and training. The course also covers the development of effective interfaces and accessibility. Prerequisite: EECE 251L. (3, 3T+0L)

330 COMPUTER NETWORKS II This course focuses on learning network design and operation from a layer 3 perspective, including both intra-domain static routing and dynamic routing protocols. Students will describe how routers discover remote

networks and determine the best path to them. They will design addressing schemes and deploy WANs, LANs and inter-networks using static routing as well as RIPv1, RIPv2, EIGRP, and OSPF protocols. Based on these protocols, students will identify the characteristics of distance vector and link state routing protocols. They will learn fundamental tools for routing scalability, and will design hierarchical routing schemes with OSPF. Students will describe the concept of traffic engineering and apply multi-path schemes. Prerequisite: EECE 132. (3, 2T+1S)

355 WEB ENGINEERING This course covers the design, implementation and testing of web-based applications including related software, database, interfaces and digital media. It also covers social, ethical and security issues arising from the web and social software. Prerequisites: IT 250 and EECE 231L. (3, 2T+1S).

440 ADVANCED COMPUTER NETWORKS Students will research, design, and implement a variety of WANs considering different technologies and protocols such as Frame Relay and PPP. Students will also implement multimedia applications over WANs, and develop knowledge and expertise in network security and management. Prerequisites: EECE 330 and EECE 342, (Fall, Spring, Summer) (3,2T+1S).

447 ROUTING AND SWITCHING You will learn how to connect computers in a network and how to connect the separate networks together to form an inter-network, through examination and implementation of bridging, switching concepts, and routing protocols and algorithms. Prerequisite: EECE 330. (3, 2T+1S)

453 ELECTRIC ENERGY STORAGE DEVICES Student will study electrochemical, electrostatic, and electromechanical processes for storage of electrical energy; design of storage systems; storage efficiency measures. Prerequisite: EET 220/L. (3, 3T+0L)

461 SOFTWARE AND DESIGN This course introduces software design and software configuration management (SCM). Design concepts, design strategies, architectural design and human computer interface design etc., will be covered. SCM principles, advanced topics and implementation procedures in one accessible resource will also be covered. It maps the integration of SCM activities within the software development life cycle. It explores the latest advances in SCM tools, SCM organization, operation and maintenance of SCM systems. (Fall) Prerequisite: EECE 435 (3T+0L)

472 PHOTOVOLTAIC DEVICES Student will study Photovoltaic effect in semiconductors; electrical and mechanical design of photovoltaic cells, panels, and systems; use of lenses and mirrors in PV systems; manufacturing methods of PV devices. Prerequisite: EET 200/L. (3, 3T+0L)

547 ROUTING AND SWITCHING Computer networking principles and operational structures of bridges, routers, routers. Packet switching techniques, routing protocols and packet processing algorithms. EECE 547 has higher standards and different deliverables than EECE 447. (3, 2T+1S)

ELECTRICAL ENGINEERING TECHNOLOGY (EET)

200 ELECTRICAL SYSTEMS I Study basic DC electrical elements and sources; energy and power; Ohm's and Kirchhoff's Laws; resistive networks; nodal and mesh analysis; and network theorems. Students will also be introduced to digital circuits and will learn Boolean logic, logic gates, combinational and sequential circuits. Prerequisite: ENGR 120L, Co-requisite: EET200L. (3, 3T+0L)

200L ELECTRICAL SYSTEMS I LAB Students will perform hands-on experiments related to DC circuits and digital circuits. This will include voltage, current, resistance measurement. First order and second order circuits will be analyzed as well as Thevenin's equivalency. Students will learn to implement and analyze digital circuits using VDHL to develop combinatorial and sequential circuits. Prerequisite: ENGR 120L, Co-requisite: EET 200. (1, 0T+1L)

300 ELECTRICAL SYSTEMS II Study basic AC electrical elements; sinusoidal sources and complex representations; impedance, phasor, analysis, complex power, three-phase circuits, and transformers. Students also will be introduced to electronic devices: diode, transistor, thyristors, rectifiers, OPAMPs and its applications. Prerequisites: EET 200/L. Co-requisite: EET 300L. (3, 3T+0L)

300L ELECTRICAL SYSTEMS II LAB Students will perform hands-on experiments related to AC circuits and electronic circuits. This will include sine wave and power factor measurement. Implementation of three-phase circuits and transformers. The labs will also expose the student to electronics including rectifies, amplifiers, and applications of thryristors, TRIACA and OPAMPS. Prerequisites: EET 200/L, Co-requisite: EET 300. (1 0T+1L)

400 CONTROL SYSTEMS AND INSTRUMENTION The course covers control systems terminology, analog and digital feedback

control system, PID and relay controls, data-acquisition system, stability, actuators and sensors. Prerequisites: EET 300/L. Co-requisite: EET 400L. (3, 3T+0L)

400L CONTROL SYSTEMS AND INSTRUMENTATION LAB The course covers experiments, design and implementation of control systems. Control systems will be developed in discrete time using digital PID and also for discrete events using PLCs. Prerequisites: EET 300/L, Co-requisite: EET 400 (1, 0T+1L)

ELECTRICAL TECHNOLOGY (ELEC)

110 INTRO TO SOLAR ELECTRICITY You will study the basics of electrical wiring technology found in photovoltaic systems, including direct current (DC) and alternating current (AC) circuits. You will review basic electrical theory and the current National Electrical Code (NEC) requirements. You will be introduced to the components found in grid-tied systems and stand-alone systems and given the opportunity to compare these systems. (1, 1T+0S)

110L INTRO TO SOLAR ELECTRICITY LAB In this course, you will have laboratory experiences which apply to the theoretical material covered in ELEC 110. You will work with AC and DC components, methods, tools, and materials needed to connect photovoltaic systems from collector module wiring to panels to batteries to inverters to grid-tie equipment. Safety in the electrical environment is stressed. (2, 0T+2S)

140 ELECTRICAL THEORY I Basic electrical theory, OHMs Law, series and parallel circuits, electrical symbols, AC and DC circuits. (3, 3T+0S)

141 ELECTRICAL CODE I National Electrical Code (NEC) requirements for single and multi-family dwellings, use of NEC tables and calculations. (3, 3T+0S)

142L RESIDENTIAL WIRING LAB Practical applications and operations in wiring techniques and codes for residential projects; tool safety, hardware use and identification. (6, 0T+6S)

150 ELECTRICAL THEORY II Basic principles of electromagnetic induction as applied to electric motors, transformers, and solenoid coils. (3, 3T+0S)

151 ELECTRICAL CODE II Code interpretation for commercial, industrial, and hazardous locations; load calculations, over-current protection and grounding. (3, 3T+0S)

152L COMMERCIAL WIRING LAB Practical applications and operations using field work: wiring techniques and codes for assigned commercial and industrial projects. (6, 0T+6S)

160 MOTOR CONTROLS Theory in across-the-line starters, solid-state control, programmable control, pilot devices, line and wiring diagrams, troubleshooting, repair techniques. Co-requisite: ELEC 160L. (3, 3T+0S)

160L MOTOR CONTROLS LAB Co-requisite: ELEC 160. (3, 0T+3S)

190 SOLAR AND WIND SYSTEMS IN THE ELECTRICAL CODE Starting with a review of DC electrical circuits, you will cover Sections 690 and 695 of the National Electrical Code, which deals with photovoltaic and wind-generated electrical systems. You will discuss conductor sizes, circuits, outlets, disconnects and over-current protection between the energy source and the service entrance. Recommended Co-requisites: RE 207 or 208. (2, 1T+1S)

ELECTROMECHANICAL ENGINEERING TECHNOLOGY (EMET)

400 ADVANCED ELECTRO-MECHANICAL DESIGN This course is integration of mechanical disciplines, controls, electronics and computers in the design of high-performance machines, devices or processes. Hands-on lab exercises and design projects will provide extensive coverage of mechanical components and assembly, sensors and actuators, electrical drive. Prerequisites: EET 200/L, DRFT 100 and MET 302. (3, 3T+0L)

490 CAPSTONE I(WIC) In this project course, students will exercise their knowledge of Electromechanical Engineering Technology, design and associated course work. EMET 490 is a Writing, Intensive Course (WIC). (3, 1T+2L)

491 CAPSTONE II In this project course, student will exercise knowledge of Electromechanical Engineering Technology, design and associated course work. Prerequisite: Senior Standing. (3, 1T+2L)

ENGINEERING (ENGR)

110L INTRODUCTION TO ENGINEERING This course is intended to provide an introduction to the engineering discipline. The course also provides a learning community experience for the mechanical engineering and information technology engineering students. Topics discussed include: departmental policies, code of ethics in engineering, history of engineering, introduction to writing technical reports, time management, introduction to concepts and techniques in computer programming. Students are exposed to intensive hands-on experiences that are assessed through a final project. Fall & Spring (2, 1T+1S)

115 BASIC MATH FOR ENGINEERING APPLICATIONS This is an accelerated math program for engineering students. Students will learn in a self-paces way, then typical concepts in Math 102, Math 130, Math 150 and Math 155 but in addition will concentrate in engineering applications and laboratory experiences. Upon mastering of the adequate concepts, students will receive a certificate/letter from the Department of Engineering. Student will take this certificate/letter to the Math department in case it is needed to override the student information system. Students will get as many certificate/letters as they demonstrate competency on the different level and this will depend on the progress each student makes. Students will be eligible to repeat this course if they want to advance more levels. The grading will be credit/no credit. Prerequisite: MATH 100 (4, 4L)

120L INTRODUCTORY MATHEMATICS FOR ENGINEERING APPLICATIONS Students will learn the basic algebraic manipulations, trigonometry, 2-D vectors, complex numbers, 3-D vectors and matrices, sinusoids, basics of differentiation, basics of integration, and linear differential equations with constant coefficients from the point of view of engineering applications. Students will learn the fundamental and minimum of these topics in order to understand the engineering applications. Prerequisite: MATH 150. (4, 3T+1L)

470 ENGINEERING MANAGEMENT I You will study engineering management and business principles for first-time engineering, science, or technology managers. You will cover time and budget management, employee and organizational management, team building and rewards, and project strategy. Prerequisite: ENG 111, with Senior standing recommended. (3, 3T+0L)

471 ENGINEERING MANAGEMENT II You will study advanced engineering management principles for mid-level and executive engineering managers, focusing on technology and science strategies at the organization or corporate level. Topics will also include technology transfer, valuation, and transactions. Prerequisite: ENGR 470. (3, 3T+0L)

472 ENGINEERING ENTREPRENEURSHIP You will study the principles of engineering/technology entrepreneurship, marketing, people management, and team building for technology-based start-ups, focusing on best practices in the formation of a company which is focused on product and service innovations. As a member of a team, you will train in business plan assembly, presentation, and defense. Prerequisite: ENG 111, with Senior standing recommended. (Spring) (3, 3T+0L)

473 FINANCING ENGINEERING COMPANIES You will study the evaluation, financing, and the investor oversight of technology or engineering start-ups; the investment principles applied to technological innovation, the interaction between entrepreneurial teams, investors, and private/public financing markets. Prerequisite: ENG 111, with Senior standing recommended. (Fall) (3, 3T+0L)

474 ENGINEERING PROJECT MANAGEMENT In this introduction to the methods underlying modern project management in the development of engineering software, hardware, or systems products, you will study team formation, status reporting, project management tools, and management of cross-disciplinary teams. Prerequisite: ENG 111, with Senior standing recommended. (Spring) (3, 3T+0L)

475 DEVELOPING ENGINEERING PRODUCTS You will study the art and science of managing engineering product development from the requirements phase to the testing phase and customer delivery and support while reviewing rapid time to market principles, along with product platform design processes. Prerequisite: ENG 111, with Senior standing recommended. (Fall) (3, 3T+0L)

476 MARKETING ENGINEERING PRODUCTS You will study marketing principles of science, technology, or engineering products and services, reviewing best practices in product research, competitive analysis, sales/marketing incentives, and the acquisition of technology products. Prerequisite: ENG 111, with Senior standing recommended. (Spring) (3, 3T+0L)

477 TECHNOLOGY TRANSFER – EAST/WEST You will study the historical, political, financial, and cultural aspects of technology transfer between countries in the western hemisphere and those in the eastern hemisphere, with particular emphasis on India and China in Asia and the United States. Your review of bargaining strengths held by parties in the negotiation will be followed by a study of subsequent development of technology through financial transactions, joint

ventures, and licensing agreements. Prerequisite: ENG 111, with Senior standing recommended. (Fall) (3, 3T+0L)

478 ENGINEERING ETHICS You will review the impact of engineering decisions in product design, testing and marketing in light of cases which depict appropriate and inappropriate ethical behavior in engineering organizations. You will also review cultural, ethnic, and historical factors in the formation of ethical systems. Prerequisite: ENG 111, with Senior standing recommended. (Spring) (3, 3T+0L)

479 ENGINEERING FACTORS IN CORPORATE STRATEGY You will study the influence, contributions and interdependency of engineering innovation on financing and market needs as these relate to corporate strategy and advancement. You will review the concepts of core competencies, engineering equity, and high performance in terms of corporate assets. Prerequisite: ENG 111, with Junior/Senior standing recommended. (Spring) (3, 3T+0L)

480 ENGINEERING MANAGEMENT AND PROJECT MANAGEMENT Student will learn Engineering management and business principles for first-time engineering, science or technology managers. Topics covered include time and budget management, employee and organization management, team building and rewards, and project strategy. Students will also be exposed to an introduction to the methods underlying modern project management in the development of engineering software, hardware or systems products. Specific topics include team formation, status reporting, project management tools and management of cross-disciplinary teams. Prerequisites: Junior standing or permission of Engineering academic adviser. (4, 4T+0L)

578 ENGINEERING ETHICS You will review the impact of engineering decisions in product design, testing and marketing in light of cases which depict appropriate and inappropriate ethical behavior in engineering organizations. You will also review cultural, ethnic, and historical factors in the formation of ethical systems. (Spring) (3, 3T+0L)

INFORMATION TECHNOLOGY (IT)

250 INTRODUCTION TO DATABASES Through an introduction to database software, you will study the Entity-Relationship model, basic database tables, queries, forms, and report creation and management. Prerequisite: EECE 152L. (3, 3T+0S)

350 DATABASE MANAGEMENT You will study current trends in data management, studying topics which include database theory and architecture, normalization, query languages, security and Web applications, focusing primarily on a study of database structures and design, hierarchical and relational models, and database access using Oracle SQL. Prerequisite: IT 250. (3, 2T+1S)

410 INFORMATION ASSURANCE AND SECURITY This courses introduces students to the principles of assurance and security, and then applies those principles to industrial and enterprise networks and information systems. The course provides a theoretical background of traditional and modern cryptographic techniques to provide for confidentiality, integrity, and availability. Concepts are then applied to secure and assure information, using a variety of techniques and frameworks such as AAA architecture, firewall technologies, intrusion prevention systems, and virtual private networks and secure management. Prerequisites: EECE 230 and 330 (3, 2T+1S)

490 IT CAPSTONE I (WIC) Capstone I is a project-oriented course where students work in teams to design and implement a large IT-related project. Projects are prepared in response to an industrial or in-house sponsor. Engineering ethics and project management skills such as communication and team management are reinforced through modules during the semester, and are applied to the different stages of the project. The course finalizes with oral presentations, written reports and/or student demonstrations which are judged by a panel composed of faculty members and external guests. IT 490 is a designated Writing Intensive Course (WIC). Prerequisite: senior standing, Information Engineering Technology major. (3, 2T+1S)

491 IT CAPSTONE II Capstone II is a project-oriented course where students work in teams to design and implement a large IT-related project. Projects are prepared in response to an industrial or in-house sponsor and may be a continuation of the project developed in Capstone I. Project management skills such as communication and team management are applied to the different stages of the project. The course finalizes with oral presentations, written reports and/or student demonstrations which are judged by a panel composed of faculty members and external guests. Prerequisite: IT 490. (3, 2T+1S)

510 INFORMATION ASSURANCE AND SECURITY You will study the background of information systems-security fundamentals and tools, emphasizing the role of general and application systems controls in protecting data and computing resources, the identification of threats, and the administrative and technological tools and techniques used to audit and monitor access and access control. Prerequisites: EECE 355 and IT 350. (3, 2T+1S)

530 NETWORK ADMINISTRATION The practice of network administration in organizations in which security, application control, software updates, hardware inventory control and operational costs are of paramount importance. Economic

modeling of organizational tasks in capital outlay, operational budgets and expense savings. (3, 3T+0S)

599 TOPICS IN IT Special topics in the IT field. (3, 3T+0S)

MECHANICAL ENGINEERING (ME)

160L GENERAL ENGINEERING DESIGN I You will be introduced to experiments in a variety of sub-disciplines of Mechanical Engineering such as engineering mechanics, mechanics of materials, thermodynamics, heat transfer, fluid mechanics solar energy applications etc. Students will have experience in laboratory/technical report writing.(3, 2T+1L)

202 ENGINEERING STATICS You will study force analysis of particles and rigid bodies in two and three dimensions using vector algebra as an analytical tool; centroids, distributed loads, trusses, frames, friction. (Cross-listed with CE 202] Prerequisites: PHYS 215/L. (Fall) (3, 3T+0L)

260L ENGINEERING DESIGN II You will study the design process, project management, shop practice, CNC and rapid prototyping, design economics, and engineering ethics. Prerequisites: ME 160L (Fall, Spring) (3, 2T+1L)

301 THERMODYNAMICS You will study thermodynamic equilibrium, thermodynamic properties and equations of state; first and second laws of thermodynamics and their applications to engineering systems; reversibility and irreversibility, and their application to second law analysis. Prerequisites: CHEM 121/L, PHYS 216/L (Spring) (3, 3T+0L)

302 MECHANICS OF MATERIALS You will study stresses and strains in members subjected to tension, compression, torsion, shear and flexure; combined and principal stresses; Mohr's circle construction; buckling, introduction to statistically indeterminate members. Prerequisites: ME 202. (Fall) (3, 3T+0L)

303 INTRODUCTION TO SOLAR ENERGY TECHNOLOGY As a junior- and senior-level science and engineering student, you will study the principles behind solar energy, preparing yourself for more advanced study. You will study solar energy resources on the earth, principles of heat transfer and optics, solar thermal systems, and solar photovoltaic conversion systems. Prerequisite: PHYS 216/L. (Fall) (3, 3T+0L)

306 DYNAMICS Principles of particle dynamics. Kinematics and kinetics of particles, systems of particles and rigid bodies. Prerequisite: ME 202 (Spring) (3, 3T+0S)

317 FLUID MECHANICS Fluid statics; control volume forms of continuity, momentum, and energy; pipe flow and turbomachinery You will be introduced to boundary layers and turbulent flow. Laboratory experiments and demonstrations of basic concepts. Prerequisite: ME 306 (Fall) (3, 3T+0L)

318L MECHANICAL ENGINEERING LAB You will be introduced to experiments in a variety of sub-disciplines of Mechanical Engineering such as engineering mechanics, mechanics of materials, thermodynamics, heat transfer, fluid mechanics, solar energy applications etc. Students will have experience in laboratory/technical report writing. Prerequisites: ME 301 and 317. (Fall) (3, 1T+2L)

320L HEAT TRANSFER Students will be introduced to the principles and engineering applications of heat transfer by conduction, convection and radiation. Students will learn to perform heat exchangers performance calculations and will be exposed to laboratory experiments and demonstrations of fundamental heat transfer concepts. Prerequisites: ME 301, ME 317. (4, 3T+1L)

357 MECHANICAL VIBRATIONS You will study free and forced vibrations of one and two degrees of freedom systems for both steady state and transient forcing, and vibrations of selected continuous systems and balancing. (Cross-listed with CE 357] Prerequisites: ME 306 and MATH 316. (Spring) (3, 3T+0L)

380 ANALYSIS AND DESIGN OF MECHANICAL CONTROL SYSTEMS You will study automatic control systems, using classical control methods in the frequency domain; classical stability and performance analysis methods including the root locus as well as the Bode and Nyquist diagrams. You will also study control design based on complex plane and frequency performance specifications. Prerequisite: MATH 316. (Fall) (3, 3T+0L)

390 POWER SYSTEMS You will study mechanical and electrical properties of machinery for power generation or deployment; network or grid design of distribution of power; sources of electric power and their characteristics of energy conversion efficiency, cost, and environmental impact; introduction to electric energy storage. (Cross-listed with EECE 390] Prerequisites: ME 306 and 317, and EECE 203L (Fall) (3, 3T+0L)

401 ADVANCED MECHANICS OF MATERIALS You will study state of stress and strain at a point, stress-strain relationship; topics in beam theory, such as asymmetrical bending, curved beams, and elastic foundations; torsion of non-circular cross

sections; energy principles. Prerequisite: ME 306. (Spring) (3, 3T+0L)

403 SOLAR THERMAL APPLICATIONS The focus of this course is on learning the fundamentals of Solar thermal engineering. Students will study thermal processes of solar energy conversion in solar engineering through topics such as solar radiation, solar harnessing equipment and systems, solar materials and properties, solar heat transfer theory, solar economics, solar applications, and solar system design. Prerequisite: MET 421. (3, 2T+1L

459 ADVANCED MECHANICAL ENGINEERING DESIGN Students will study common engineering materials and their properties and stress-strain analysis. Students will apply the concepts of statistical considerations and factor of safety to design machine elements such as shaft, permanent and non- permanent joints etc. from the point of view of static and fatigue strength. Prerequisite: ME 302. (3, 3T+0L)

490 CAPSTONE IN MECHANICAL ENGINEERING I (WIC) In this project course, you will exercise your knowledge of mechanical engineering, design, and associated coursework. (Fall) (4, 2T+2L)

491 CAPSTONE IN MECHANICAL ENGINEERING II In this project course, you will exercise your knowledge of mechanical engineering, design, and associated coursework. Prerequisite: ME 490. (Spring) (4, 2T+2L)

MECHANICAL ENGINEERING TECHNOLOGY (MET)

403 SOLAR THERMAL APPLICATIONS You will study thermal processes of solar energy conversion in solar engineering through topics such as solar radiation, solar harnessing equipment and system, solar materials and properties, solar heat transfer theory, solar economics, solar applications, and solar system design. Prerequisite: PHYS 216/L (Spring) (3, 3T+0L)

VI) College Processes and Policies

VI.a) Course Transfer and Substitution Process.

(a) For bachelor programs, no more than 90 credits from another institution will be accepted; for associate programs, no more than 30 credits from another institution will be accepted.
(b) Students should request a course transfer or course substitution in writing to their advisor and Dean.
(c) If a course belongs to any transfer module for the state of New Mexico, it will be transferred or substituted automatically.
(d) If a course belongs to a set of courses approved under a Memorandum of Agreement (MOA) between NNMC and another institution, it will be transferred/substituted automatically.
(e) If the course does not belong to any transfer module for the state of New Mexico or if it is not part of a MOA between NNMC and other institution then:
    1. A student should submit the syllabus of the course to be transferred and/or substituted.
    2. The advisor will review the catalog description and/or syllabus of the course. Its content must be similar in a minimum of 80% in order to be accepted.
    3. The advisor will submit the recommendation to the Dean for final approval.
    4. After the Dean's approval, the advisor will submit a memorandum to the Registrar to formalize the transfer or substitution. This formal process may wait until the petition to graduate is submitted.
(f) The ENGR 110 (Introduction to Engineering) course may be waived for transfer students that have completed 30 or more credits in engineering at another institution. In this case, the course will be replaced by another engineering class either from a previous transcript or an engineering class at Northern.
(g) It is NNMC policy that FYE 101 (Freshman Year Experience) may be waived for transfer students that have completed 30 or more undergraduate college credits. In this case, the FYE 101 course will be replaced by any 3-credit college course.

VI.b) Course Transfer Agreements with NM Institutions.

Northern has signed transfer agreements with the following institutions:

1) Santa Fe Community College (SFCC). Transfer agreement from SFCC Associate of Science in Computer Science to NNMC Bachelor of Information Engineering Technology, and transfer agreement from SFCC Associate of Science in General Engineering to NNMC Bachelor of Electromechanical Engineering Technology.
2) Southwestern Indian Polytechnic Institute (SIPI). Transfer agreement from SIPI Associate of Science in Network Management to NNMC Bachelor of Information Engineering Technology, and transfer agreement from SIPI Associate of Science in Pre-engineering to NNMC Bachelor of Electromechanical Engineering Technology.
3) University of New Mexico (UNM). Transfer agreement from NNMC Post-baccalaureate Certificate in Information Engineering Technology to UNM Master of Science in Computer Engineering.
4) Eastern New Mexico University – Ruidoso (ENM-Ruidoso). Transfer agreement from ENM-Ruidoso Associate of Applied Science to NNMC Bachelor of Information Engineering Technology.

If you are part of any degree mentioned above and you are planning to transfer to/from those institutions, please contact your academic advisor to review the transfer agreements. You may save time and money by learning the transferability of courses that have already been negotiated in these institutional agreements. For transfers to NNMC, those agreements cover the minimum, you can always get more courses transferred to NNMC if the College of Engineering and Technology approves them.

VI.c) Course Pre-requisites and Waivers.

Many courses in the programs have pre-requisite courses as a requirement for enrollment. The courses were selected to guarantee a minimum background for the students to understand and to learn the new course content.

In very special circumstances, the academic advisor may waive a prerequisite after consulting and getting approval from the appropriate Dean. It is actually the Dean who manually overwrites the Banner system to waive the pre-requisite and enroll the student.

VI.d) Senior Standing Definition

This definition was approved starting in Spring 2013 and updated in Fall 2015.

Full-time faculty members of the Bachelor of Engineering in Information Engineering Technology program agreed upon defining the "Senior Standing" for the program as follows:

A student earns "Senior Standing" status if:

The student has been admitted to the Bachelor in Information Engineering Technology and has passed the following courses:

- EECE 329 Human Computer Interaction
- EECE 330 Computer Networks II
- IT 350 Database Management
- EECE 355 Web Engineering
- ENG 116 Technical Writing
- SPCH 130 Public Speaking

Faculty members agreed that any senior student is required to have a degree of knowledge in the 5 pillar areas (defined by the ACM/IEEE joint committee for IT undergraduate programs) of IT. These areas are covered by the courses listed in the Table I.

Course	Programming	HCI	Networks	Databases	Web Systems
EECE 329	X	X			
EECE 330			X		
IT 350				X	
EECE 355					X

Table I. Courses that cover pillar areas of IT that are required by students to be considered as senior students.

For the Bachelor of Engineering in Electromechanical Engineering Technology program faculty agreed upon defining the Senior Standing for the program as follows:

A student earns "Senior Standing" status if:

The student has been admitted to the Bachelor in Electromechanical Engineering Technology and has passed the following courses:

- MET 302 Strength and Properties of Materials
- MET 420 Fluid Mechanics (3)
- EECE 472 Photovoltaic Devices
- EET 400/L Control Systems and Instrumentation
- ENG 116 Technical Writing
- SPCH 130 Public Speaking

Faculty members agreed that any senior student is required to have a degree of knowledge in the four pillar areas of EMET program at NNMC. These areas are covered by the courses listed in the Table II.

Courses	Electromechanical Design	Fluid Thermal Sciences	Control Systems	Solar Energy Application
MET 302	X			
MET 420		X		

EET 400/L			X	
EECE 472				X

Table II. Courses that cover pillar areas of EMET that are required by students to be considered as senior students.

The importance of Senior Standing definition is to regulate eligibility for Capstone courses. Only senior students, under these definitions, are eligible to take Capstone courses.

VI.e) Work in Lieu of Courses

If a student wants to claim work in lieu of courses the following policy applies:

a) If a student claims experience in the content of a course, the policy for the student is to test-out (the testing-out policy is explained below).

b) Students who want to substitute a real life on-the-job project for a Capstone course must submit a project proposal for evaluation to the faculty leading the course. The faculty will decide if the external project is adequate and equivalent to an internal project. If the project proposal is approved, the student will still be mentored by a Northern faculty member in addition to any other mentors.

VI.f) Student Advisement

(a) Every student that has declared a degree in Engineering/CTE must have an academic advisor.
(b) New students go to the Advisement Center as the first point of contact and then are sent to the Dean. The Dean is the advisor during the weeks previous to enrollment.
(c) Academic Advisors are assigned to new students during the first three weeks of the semester by the Dean, and the assignments are discussed in a faculty meeting for final approval.
(d) After the faculty meeting, advisors are linked to the advisee in the College's Banner System by the Administrative Assistant.
(e) During the fourth week of the semester, an email is sent to all new students informing them of their academic advisor.
(f) Before early registration starts, the Registrar and Records Office will assign an alternate Personal Identification Number (PIN) for each student.
(g) Before early registration starts, a list of each student's academic advisor will be posted on doors and bulletin boards of the Engineering Buildings.
(h) Students are required to visit their advisor to discuss their progress and to begin their next semester's registration any time during the semester. This is a mandatory visit as it provides the student with an alternate PIN.
(i) After the advisee meets with their advisor, the latter will provide the alternate PIN to the student for registration.
(j) It is recommended that every student meet at least two times per semester with his/her academic advisor to discuss the academic progress.

VI.g) Grade Appeal

The College of Engineering and Technology at Northern New Mexico College applies the present grade appeal process to all classes offered by the College of Engineering and Technology.

When a student believes that his or her final grade for a course was unfair, the student can use the process described herein to seek resolution of the matter. The burden of proving a claim of an unfair grade rests with the student. Grades are awarded or changed only by the course instructor or through this appeals process. An appealed grade may be raised or lowered during the course of this appeals process. The parties should make every effort to achieve consensus and to resolve conflicts at the lowest level and as quickly as possible.

Time Schedule

The student must direct an appeal in writing to the course instructor involved no later than the first 30 days of the starting day of the next semester, as stated below:

- Appeal of a grade obtained in a Spring semester course: the student must appeal in writing no later than the first 30 days of the following Fall semester.

- Appeal of a grade obtained in a Fall semester course: the student must appeal in writing no later than the first 30 days of the following Spring semester.
- Appeal of a grade obtained in a Summer semester course: the student must appeal in writing no later than the first 30 days of the following Fall semester.

Grade Appeal Process

Step 1. If a student has a reason to believe that a grade he/she has received is incorrect, the student should first meet with the instructor of the class and attempt to solve the grading issue with him/her. Step 1 must be completed within the time schedule above (no later than the first 30 days of the following semester).

Step 2. If no satisfactory resolution is reached in Step 1, the student should attempt to resolve the matter by consultation with the appropriate Dean. Before consulting with the Dean, the student must file a written summary explaining the case. The written summary should be submitted to the Administrative Assistant or directly to the Dean. Step 2 must be completed within the next 15 days after the resolution of Step 1.

Step 3. If no satisfactory resolution has been reached in Step 2 through the consultation with the Dean, the student shall initiate a grade appeal process with the Scholastic Standards Committee of the College. This last process is initiated by filling the form "Student Petition for Grade Appeal" and providing a written summary of the situation and a detailed, specific statement of what the student want (e.g., change a grade from F to C). The form and summary must be submitted to the Chair of the Scholastic Standards Committee. The Scholastic Standards Committee Chair will schedule the appeal time and date. Submission of the "Student Petition for Grade Appeal" and summary of situation must be submitted within the next 15 days after the resolution of Step 2.

VI.h) Policies for Student Employed at the College of Engineering and Technology

(a) Employee will need to be a student enrolled at NNMC on a full-time or part-time basis.
(b) Employee will prepare bi-weekly reports with a bullet list of activities performed in the previous two weeks and email it to his/her supervisor every other Friday, starting in the second week after been hired.
(c) Employee must complete a PAN request form three weeks prior to the first day of employment. Once contract has expired and accepted for rehired employee must complete another PAN request. (Note: this process applies for each semester and must meet the PAN request timeline which is seven day prior to Time Sheet due date.)
(d) Employee is responsible for following up on PAN contract with the Human Resources department prior to the first day of employment.
(e) Employee will prepare and sign time sheets (if required) every other week by the deadline. The timesheet schedule can be obtained from the payroll office.
(f) Employee will prepare and sign Time and Effort Report forms every tenth of the month.
(g) A two week advance notice for resignation is expected from a student employee.
(h) A student employee may be terminated due to lack of work, lack of funding, unsatisfactory performance, misconduct, or violation of NNMC rules.
(i) The supervisor or Dean should give two weeks advance notice of termination. A student employee who is found in gross violation of NNMC rules or misconduct may be terminated without advance notice.

The minimum salary schedule for students working on peer-tutoring activities is described in the following two tables and the amounts are expressed in USD per hour.

Peer Tutoring	**3.0<GPA<3.5**	**GPA > 3.5**
Freshman	$8	$8.5
Sophomore	$8.75	$9
Junior	$9.5	$10
Senior	$11	$12

The minimum salary schedule for students working on research or other activities (different from tutoring) is described in the following two tables and the amounts are expressed in USD per hour.

Research and/or Others	
Freshman/Sophomore	$12 (minimum)
Junior/Senior	$15 (minimum)
Graduate Assistant	$1100 **per month**

VI.i) Curriculum Changes

(a) Every program will meet its External Advisory Committee (EAC) at least one time per year.
(b) The curriculum change will be presented before the EAC for discussion.
(c) New required competencies recommended by the EAC will be documented.
(d) New courses will be generated by faculty members and will include the recommended competencies.
(e) A leader in the field will be responsible for the course planning, administration and updates.
(f) The leader will prepare the standard syllabus including the course description, textbook, course outcomes, student learning outcomes, and propose an evaluation plan.
(g) The faculty leader will present to the College of Engineering and Technology faculty.
(h) The faculty of the program will approve the curriculum chagne for final presentation before the Undergraduate Curriculum Committee.
(i) The faculty leader will prepare buck sheet and the syllabus and present them to the Undergraduate Curriculum Committee.

VI.j) Independent Study Policy

This policy was approved starting in Spring 2013. For some special cases, a student may enroll in credits of Independent Study and substitute those for other classes with a maximum of 6 credits. The following criteria apply:

- The Independent study serves two main purposes:
  - The student may decide to study the material for a particular class in the degree plan that it is not offered and test-out at the end of the term. The test-out policy is defined in the following section.
  - The student may perform an internal or external project. In this case, the project should be approved previously according to the criteria used for Capstone projects.

VI.k) Testing-Out Courses Policy

This policy was approved starting in Spring 2013. Students may opt to test-out of courses that they consider unnecessary due to previous experiences and/or knowledge in the topics covered in the course. However, certain courses cannot be tested-out.

In order to test-out, the student needs to submit a Request for Course Test-Out to their advisor. The College of Engineering and Technology will determine a date/time for the test. The request cannot be submitted later than the 8th week of the semester (Spring or Fall), and the test will be scheduled within the last 4 weeks of the semester. A test is rarely offered during the summer.

For the Bachelor in Information Engineering Technology Program the following courses cannot be tested-out.

- EECE 329
- EECE 355
- IT 410
- IT 490
- IT 491
- 6 Credits of Technical Electives (IT/CS/EECE/MATH)

For the Bachelor of Engineering in Electromechanical Engineering Technology Program the following courses cannot be tested-out.

- EET 200L (lab)
- EET 300L (lab)

- EECE 472
- MET 310
- EMET 490
- EMET 491
- 6 Credits of Elective in CS/EECE/IT/ME