



| <b>DEGREE SHEET / 2020-2021 CATALOG</b>   |                 |              |
|---|-----------------|--------------|
| Student name:   |                 |              |
| Eagle ID:   |                 |              |
| Eagle Email:  |                 |              |
| Phone:  |                 |              |
| <p><b>BACHELOR OF ENGINEERING (BEng)<br/>ELECTROMECHANICAL ENGINEERING TECHNOLOGY</b></p> <p>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.</p> <p>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.</p> |                 |              |
| <b>GENERAL EDUCATION REQUIREMENTS (32 Credits)</b>  | <b>SEMESTER</b> | <b>GRADE</b> |
| <b>AREA I: COMMUNICATIONS (6 Credits)</b>   |                 |              |
| ENGL 1110 Composition I (3)<br><i>Pre-requisites: ENGL 109 or adequate score on the Course Placement Evaluation</i>   |                 |              |
| ENGL 1210 Technical Communications (3)<br><i>Pre-requisite: ENGL 1110</i>   |                 |              |
| <b>AREA II: MATHEMATICS (4 Credits)</b>   |                 |              |
| ENGR 121L and ENGR 122L Introduction to Math for Engineering Applications I and II (2 credits each for engineering majors)<br><i>Pre-Requisite: Math 1215</i>   |                 |              |
| <b>AREA III: LABORATORY SCIENCES (4 Credits)</b><br><i>You must select one science course with a lab</i>  |                 |              |
| ENGR 101/L Computer Science for All (4)   |                 |              |
| <b>AREA IV: SOCIAL/BEHAVIORAL SCIENCES (3 Credits)</b><br><i>Pre-requisite: ENGL 109 or adequate score on the Course Placement Evaluation<br/>You must select one Area IV course.</i>   |                 |              |
| Area IV Course (3)  |                 |              |

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| <b>AREA V: HUMANITIES (3 Credits)</b><br><i>Pre-requisite: ENGL 109 or adequate score on the Course Placement Evaluation</i><br><i>You must select one Area V course.</i>   |  |  |
| Area V Course (3)   |  |  |
| <b>AREA VI: FINE ARTS (3 Credits)</b><br><i>You must select one Area VI course</i>  |  |  |
| Area VI Course (3)  |  |  |
| <b>ADDITIONAL NINE CREDIT HOURS (9 Credits)</b>   |  |  |
| COMM 1130 Public Speaking (3)<br><i>Pre-requisite: ENG 109</i>  |  |  |
| <b>Choose one of the following Civics Courses (3)</b><br><br>POLS 1100 Introduction to Political Science (3)<br>POLS 1120 American National Government (3)<br>CJUS 1110 Introduction to Criminal Justice (3)<br>HIST 1110 United States History I (3)<br>HIST 1120 United States History II (3) |  |  |
| <b>Choose one of the following STEMH recommended Courses (3)</b><br><br>ENVS 2130 Critical Thinking in Science (3)<br>PSYC 2120 Developmental Psychology (3)  |  |  |
| <b>SUPPORT COURSES (16 Credits)</b>   |  |  |
| MATH 1510 Calculus I (4)<br><i>Pre-requisites: MATH 1250 or adequate score on the Course Placement Evaluation</i>   |  |  |
| MATH 1520 Calculus II (4)<br><i>Pre-requisites: MATH 1510</i>   |  |  |
| ENGR 215 Physics for Engineers I (2)<br><i>Pre-requisite: ENGR 121L</i>   |  |  |
| ENGR 216L Physics for Engineers II (3)<br><i>Pre-requisites: ENGR 215</i>   |  |  |
| ENGR 217L Physics for Engineers III (3)<br><i>Pre-requisite: ENGR 215</i>   |  |  |
| <b>PROGRAM REQUIREMENTS (72 Credits)</b>  |  |  |
| ENGR 110L Introduction to Engineering (3)<br><i>Pre-requisite: None</i>   |  |  |
| DRFT 100 Computer Aided Drafting I (4)<br><i>Pre-requisite: None</i>  |  |  |
| EECE 152 Computer Programming I (3)<br><i>Pre-requisite: None</i>   |  |  |
| MET 201 Applied Mechanics I (3)<br><i>Pre-requisite: ENGR 215</i>   |  |  |
| MET 301 Applied Mechanics II (2)<br><i>Pre-requisite: MET 201</i>   |  |  |
| MET 302 Strength and Properties of Materials (3)<br><i>Pre-requisite: MET 201</i>   |  |  |

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|--|-------------|--|
| MET 310 Manufacturing Processes and Automation (3)<br><i>Pre-requisite: DRFT 100</i>   |             |  |
| EET 200/L Electrical Systems I with Lab (2)<br><i>Pre-requisite: ENGR 217L</i>   |             |  |
| EET 201/L Digital Systems I (2)<br><i>Pre-requisite: ENGR 121L</i>   |             |  |
| EET 300/L Electrical Systems II with Lab (4)<br><i>Pre-requisite: EET 200/L</i>  |             |  |
| EET 400/L Control Systems and Instrumentation with Lab (4)<br><i>Pre-requisite: EET 300/L</i>  |             |  |
| EMET 400 Advanced Electro-Mechanical Design (3)<br><i>Pre-requisite: DRFT 100, EET 200/L, and MET 302</i>  |             |  |
| MET 303 Thermodynamics (3)<br><i>Pre-requisite: ENGR 216L</i>  |             |  |
| MET 317 Fluid Mechanics (3)<br><i>Pre-requisite: MET 301</i>   |             |  |
| EMET 402 Robotics (3)<br><i>Pre-requisite: EET 400</i>   |             |  |
| MET 421 Heat Transfer (3)<br><i>Pre-requisite: MET 317</i>   |             |  |
| MATH 296 Introduction to Applied Ordinary Differential Equations (3) OR<br>MATH 316 Applied Ordinary Differential Equations (3)<br><i>Pre-requisite: MATH 163E</i> |             |  |
| ENGR 480 Engineering Management and Project Management (4)<br><i>Pre-requisite: Junior status or permission of academic advisor</i>                                |             |  |
| EMET 490 Capstone I (3)<br><i>Pre-requisite: Senior status</i>   |             |  |
| Lower/Upper Division Engineering or Technical or MATH Elective (14)<br>At least 6 upper division credits.  |             |  |
| Elective (3)   |             |  |
| Elective (3)   |             |  |
| Elective (3)   |             |  |
| Elective (3)   |             |  |
| Elective (2)   |             |  |
| <b>TOTAL CREDITS 120</b>   |             |  |
| <b>ADVISOR APPROVAL</b>  | <b>DATE</b> |  |

## SUGGESTED SEQUENCE OF COURSES

### **FIRST SEMESTER (15 Credits)**

ENGR 121L Introductory Mathematics for Engineering Applications I (2)  
ENGR 215 Physics for Engineers I (2)  
ENGR 110L Introduction to Engineering (3)  
DRFT 100 Computer Aided Drafting I (4)  
Elective Laboratory Sciences (4)

### **SECOND SEMESTER (17 Credits)**

EECE 152L Computer Programming I (3)  
ENGR 122L Introductory Mathematics for Engineering Applications II (2)  
MET 201 Applied Mechanics I (3)  
Elective Lower Division Engineering or Tech or Math (3)  
Elective Lower Division Engineering or Tech or Math (3)  
Elective Additional 9 Credit Hours (3)

### **THIRD SEMESTER (16 Credits)**

MATH 1510 Calculus I (4)  
ENGR 216L Physics for Engineers II (3)  
ENGR 217L Physics for Engineers III (3)  
Elective Humanities (3)  
ENGL 1110 Composition I (3)

### **FOURTH SEMESTER (16 Credits)**

MET 301 Applied Mechanics II (2)  
EET 200L Electrical Systems I with Lab (2)  
EET 201L Digital Systems with Lab (2)  
MATH 1520 Calculus II (4)  
ENGL 1210 Technical Communications (3)  
Elective Social/Behavioral Sciences (3)

### **FIFTH SEMESTER (16 Credits)**

MET 303 Thermodynamics (3)  
EET 300/L Electrical Systems II with Lab (4)  
MET 302 Strength and Properties of Materials (3)  
COMM 1130 Public Speaking (3)  
MATH 296 Introduction to Applied Ordinary Differential Equations (3)

### **SIXTH SEMESTER (17 Credits)**

MET 317 Fluid Mechanics (3)  
EET 400/L Control Systems and Instrumentation with Lab (4)  
Elective Additional 9 Credit Hours (3)  
ENGR 480 Engineering Management and Project Management (4)  
Elective Lower/Upper Division Engineering or Tech or Math (3)

### **SEVENTH SEMESTER (12 Credits)**

EMET 402 Robotics (3)  
EMET 400 Advanced Electro-Mechanical Design (3)  
MET 421 Heat Transfer (3)  
MET 310 Manufacturing Processes and Automation (3)

**EIGHT SEMESTER (11 Credits)**

Elective Lower/Upper Division Engineering or Tech or Math (3)

Elective Lower/Upper Division Engineering or Tech or Math (2)

EMET 490 Capstone I (3)

Elective Fine Arts (3)

# EDUCATIONAL PLANNING FORM (Semester)

| FALL SEMESTER | SPRING SEMESTER | SUMMER      |
|---------------|-----------------|-------------|
|               |                 |             |
| Total Units   | Total Units     | Total Units |
| FALL SEMESTER | SPRING SEMESTER | SUMMER      |
|               |                 |             |
| Total Units   | Total Units     | Total Units |
| FALL SEMESTER | SPRING SEMESTER | SUMMER      |
|               |                 |             |
| Total Units   | Total Units     | Total Units |
| FALL SEMESTER | SPRING SEMESTER | SUMMER      |
|               |                 |             |
| Total Units   | Total Units     | Total Units |