



## **Electrical and Manufacturing G.A.**

Career Community: Electrical and Manufacturing

Curriculum Code: 1856

Effective: Fall 2025 – Summer 2030

### **Purpose of the Major**

The Electrical and Manufacturing General Associate Degree at Lansing Community College introduces students to the expansive world of careers in electrical and manufacturing fields, focusing on key areas such as Electrical Technology, Electrical Utility Lineworker, Mechanical Systems, Mechatronics, Robotics, and Welding. Emphasizing practical applications and industry-relevant training, this degree program equips students with the skills needed to thrive in careers demanding skills in the areas of electrical, manufacturing, and welding fields.

### **Milestone**

In addition to the required General Education courses in Math and English, completion of METD 100 or METD 110 or TECH 102 with a 2.0 or higher is a key component for success in completing this program. Knowledge obtained in these courses is the foundation for learning in other required courses. Students are encouraged to contact their faculty if they need additional assistance with learning the concepts presented in these courses.

### **Additional Information**

The majority of instruction is hands-on laboratory time, and most lab and lectures feature small class sizes to provide generous personal interaction with your instructors. All instructors bring their extensive years of experience working within their respective industry to the classroom, including all related certifications.

Not all courses in this program transfer to all colleges. Students planning to transfer should see an academic advisor before enrolling in any course.

### **Contact Information**

For further information, including about career options, course substitutions and waivers, etc., contact the Trades Technology Department, West Campus, telephone number 517-483-1336, or Student Services, West Campus, telephone number 517-483-5509.

### **Electrical and Manufacturing Career Community Courses**

*These courses are required for all Electrical and Manufacturing programs (Electrical Technology, Electrical Utility/Lineworker, Industrial Manufacturing Engineering Technology, Manufacturing Engineering Technology, Mechanical Systems, Mechatronics – Multiskilled Maintenance Technology, Welding Technology). They should be taken before other Major Required or Limited Choice Courses. Some courses meet General Education requirements for MTA. A minimum of 2.0 is required to meet LCC degree requirements for General Education courses and for all courses to transfer to other colleges (some colleges, and some programs within colleges, require a higher grade in a course).*

Course Code	Course Title	Credit/ Billing Hours
ACAD 100	First-Year Experience	1 / 1
COMM 110 or COMM 120 or COMM 130 or COMM 200 or COMM 240 or COMM 260 or ENGL 122 or ENGL 132	Communication in the Workplace Dynamics of Communication Fundamentals Public Speaking Small Group Communication Interpersonal Communication Nonverbal Communication Composition II Honors Composition II	3 / 3 3 / 3 3 / 3 3 / 3 3 / 3 3 / 3 4 / 4 4 / 4
ELTE 121 or MATH 115 or MATH 119 or MATH 120 or MATH 126	Electrical Mathematics Technical Mathematics Math – Applications for Living College Algebra Precalculus	5 / 6 4 / 4 4 / 4 4 / 4 5 / 5
ENGL 121 or ENGL 124 or ENGL 127 or ENGL 131	Composition I Technical Writing Business Writing Honors Composition I	4 / 4 3 / 3 3 / 3 4 / 4
METD 100 or METD 110 or TECH 102	Basic Mechanical Drafting Mechanical CAD Drafting I General Industry Safety	3 / 4 4 / 6 2 / 3

Notes:

ACAD 100 may be waived when students meet one of the following College-approved waiver criteria:

- Completion of 12 college-level credits with minimum grades of 2.0 shown on the LCC transcript (including transfer, if applicable), or
- Employment in the field of, or a field related to, the degree being sought, or
- For Health Careers students, successful completion of CHSE 100.

Students wishing to waive ACAD 100 should contact their advisor.

Students considering Computer Aided Design or Manufacturing Engineering Technology, choose METD 100 or METD 110 (based on placement testing). All other students should choose TECH 102.

Students considering Industrial Manufacturing Engineering Technology, choose COMM 130, ENGL 121, and MATH 126.

Students considering future transfer, choose MATH 119, MATH 120, or MATH 126.

**Major Required Courses, Limited Choice – Humanities and Fine Arts or Social Sciences or Applied Social Sciences** - *Select one as recommended or select one from [LCC General Education Applied Degrees](#): Humanities and Fine Arts or Social Sciences or Applied Social Sciences. A minimum grade of 2.0 is required for General Education courses.*

Course Code	Course Title	Credit / Billing Hours
GEOG 200	World Regional Geography	4 / 4
MGMT 234	Diversity in the Workplace	3 / 3
SOCL 120	Introduction to Sociology	4 / 4

Note: Students considering future transfer, choose GEOG 200 or SOCL 120.

**Major Required Courses, Limited Choice – Natural Sciences or Applied Sciences and Technology Lab** - *Select one as recommended or select one from [LCC General Education Applied Degrees](#): Natural Sciences or Applied Sciences and Technology Lab. A minimum grade of 2.0 is required for General Education courses.*

Course Code	Course Title	Credit / Billing Hours
BIOL 120	Environmental Science	4 / 6
CHEM 151 and CHEM 161	General Chemistry Lecture I General Chemistry Lab I	5 / 7
METM 190	Metallurgy and Heat Treatment	4 / 6
PHYS 120	The Art of Physics	4 / 5
PHYS 200	Intro to Applied Physics	4 / 5
PHYS 221	Introductory Physics I	4 / 6

Note: Students considering Computer Aided Design, Industrial Manufacturing Engineering Technology, or Welding Technology, choose METM 190.

**Major Required Courses, Limited Choice** - *Select 33 credits. Work with an Academic Advisor or Program Advisor to select the most appropriate courses or to select a field-specific major or transfer major that meets your educational and career goals. A minimum of 2.0 is required to transfer to other colleges (some colleges, and some programs within colleges, require a higher grade in a course.)*

Course Code	Course Title	Credit / Billing Hours
BLDT 120	Structural Framing	4 / 6
CITN 115	IoT & Automation Fundamentals	5 / 6
DCTM 101	Drafting/Intro to CAD	3 / 4
ELTA 105	Elect. Industry Orientation	.5 / .5
ELTA 106	Basic Electrical Calculations	2 / 2
ELTA 120	AC Fundamentals - Electrician	2 / 3
ELTA 155	Transformer Fundamentals	2 / 3
ELTA 160	PLC Overview for Electricians	1 / 2
ELTA 180	Introduction to Fire Alarms	1 / 1
ELTE 104	Employee Worksite Basics	1 / 1

Course Code	Course Title	Credit/ Billing Hours
ELTE 110	Practical Electricity	4 / 6
ELTE 111	Intro to Industrial Automation	4 / 6
ELTE 112	Basic Wiring Installation	2 / 3
ELTE 121	Electrical Mathematics	5 / 6
ELTE 123	Motors and Transformers	5 / 7
ELTE 131	Machine Controls I	4 / 5
ELTE 132	Control Panel Assembly	2 / 3
ELTE 136	Digital Basics	2 / 3
ELTE 141	National Electrical Code I	4 / 4
ELTE 142	National Electrical Code II	4 / 4
ELTE 145	Electrical Prints for Building	4 / 5
ELTE 150	Electric Motor Maintenance	2 / 3
ELTE 154	Utility Prints and Diagrams	3 / 3
ELTE 156	Lineworker/Utility Rigging	3 / 4
ELTE 173	Energy Industry Fundamentals I	2 / 2
ELTE 174	Energy Industry Fundamentals II	2 / 2
ELTE 181	Pole Climbing I	.5 / 1
ELTE 182	Pole Climbing II	.5 / 1
ELTE 185	Pole Climbing Practice I	.25 / .5
ELTE 232	Machine Controls II	4 / 6
ELTE 255	Power Instrumentation	4 / 5
ELTE 260	Programmable Controllers I	4 / 6
ELTE 261	Programmable Controllers II	6 / 8
ELTE 262	Programmable Controllers III	5 / 8
ELTE 270	Lineworker Fundamentals	1 / 1.5
ELTE 272	Electric Basic Line Climbing	4 / 6
ELTE 274	Ground/Utility Worker	6 / 9
ELTE 276	Energized Secondary Worker	5 / 8
ELTE 290	Electrical Internship	2-4 / 2-4
ENGL 122	Composition II	4 / 4
GSCI 210	Global Positioning Systems	3 / 4
METD 110	Mechanical CAD Drafting I	4 / 6
METD 111	Mechanical CAD Drafting II	4 / 6
METD 130	Geometric Dimension/Tolerance	4 / 6
METD 150	Industrial Blueprint Reading	3 / 3
METD 220	Basic Unigraphics/NX	4 / 6
METD 221	Advanced Unigraphics/NX	4 / 6
METD 240	Basic NX Machining	4 / 5
METD 250	Detailing Assembly Drawings	4 / 6
METM 100	Manufacturing Processes	3 / 4.5
METM 108	Machine Tool Operations	4 / 6
METM 112	Introduction to CNC Machining	4 / 6

Course Code	Course Title	Credit / Billing Hours
METM 190	Metallurgy and Heat Treatment	4 / 6
METM 195	Quality /Metrology/Inspection	4 / 6
METM 220	Basic Mastercam	4 / 6
METM 221	Advanced Mastercam	4 / 6
METS 110	Mechanical Power Transmissions	4 / 6
METS 115	Intro to Mechanical Systems	4 / 6
METS 120	Industrial Pneumatics	4 / 6
METS 125	Intro to Hydraulics/Pneumatics	4 / 6
METS 130	Industrial Hydraulics	4 / 6
METS 140	Rigging	3 / 4.5
METS 145	Automated Systems	3 / 4.5
METS 160	Introduction to Robotics	3 / 4.5
METS 161	Intro to FANUC Robotics	3 / 4.5
METS 162	Intro to ABB Robotics	3 / 4.5
METS 210	Lubrication and Bearings	4 / 6
METS 250	Gen. Prevent/Predictive Maint	3 / 4.5
METS 260	Advanced Robotics Capstone	3 / 4.5
PFFT 182	Lineworker Fitness B	1 / 2
PFFT 183	Lineworker Fitness C	2 / 4
WELD 103	Combination Welding	4 / 6
WELD 105	Advanced ARC Welding	4 / 6
WELD 110	Gas Metal ARC Welding	4 / 6
WELD 111	Gas Tungsten ARC Welding	4 / 6
WELD 115	Robotic MIG Welding	4 / 6
WELD 125	Structural Print Reading/Weld	2 / 2
WELD 201	Tool and Die Welding	3 / 4.5
WELD 205	Pipe Welding	4 / 6
WELD 220	Structural Fab & Inspection	4 / 6
WELD 250	Welding Internship	3 / 3

### **General Education – Applied Degrees**

- English Composition or Applied English  
Career Community Courses meet this requirement.
- English Composition (second course)/Communication  
Career Community Courses meet this requirement.
- Humanities and Fine Arts or Social Sciences or Applied Social Sciences  
Major Required Limited Choice Courses meet this requirement.
- Mathematics or Applied Mathematics  
Career Community Courses meet this requirement.
- Natural Sciences Lab or Applied Science and Technology Lab  
Major Required Limited Choice Courses meet this requirement.

## Additional Credits

After completing the course and credit requirements as noted on this pathway, students who fall short of the 60-credit minimum required for an Associate Degree may select any course(s) needed to reach 60 credits, except those courses noted in number 7 in the [Institutional Requirements for Associate Degrees](#). Students are encouraged to use Degree Works and meet with an Advisor to ensure all requirements are met and for course recommendations.

## Minimum Total Credit Hours

60 credits / 62 billing hours

## Recommended Course Sequence

### Full-time

Semester I
ACAD 100
ENGL 098 and NCAS 103 (if needed) or ENGL 099 (if needed), ENGL 121 or ENGL 124 or ENGL 127 or ENGL 131
GEOG 200 or MGMT 234 or SOCL 120
METD 100 or METD 110 or TECH 102 – Milestone
Limited Choice course for students completing the Electrical and Manufacturing GA

Semester II
COMM 110 or COMM 120 or COMM 130 or COMM 200 or COMM 240 or COMMM 260 or ENGL 122 or ENGL 132
ELTE 121 or MATH 115 or MATH 119 or MATH 120 or MATH 126
Limited Choice course(s) for students completing the Electrical and Manufacturing GA

Semester III
BIOL 120 or (CHEM 151 and CHEM 161) or METM 190 or PHYS 120 or PHYS 200 or PHYS 221
Limited Choice course(s) for students completing the Electrical and Manufacturing GA
Students who have decided on an academic program within the Electrical and Manufacturing Career Community should select that program through the Change of Program Request form and follow the coursework outlined for the associated pathway.

Semester IV
Limited Choice course(s) for students completing the Electrical and Manufacturing GA
Students who have decided on an academic program within the Electrical and Manufacturing Career Community should select that program through the Change of Program Request form and follow the coursework outlined for the associated pathway.

### Part-time

Semester I
ACAD 100

Semester I
ENGL 098 and NCAS 103 (if needed) or ENGL 099 (if needed), ENGL 121 or ENGL 124 or ENGL 127 or ENGL 131
GEOG 200 or MGMT 234 or SOCL 120
METD 100 or METD 110 or TECH 102 - Milestone

Semester II
COMM 110 or COMM 120 or COMM 130 or COMM 200 or COMM 240 or COMMM 260 or ENGL 122 or ENGL 132
ELTE 121 or MATH 115 or MATH 119 or MATH 120 or MATH 126
Limited Choice course(s) for students completing the Electrical and Manufacturing GA

Semester III
BIOL 120 or (CHEM 151 and 161) or METM 190 or PHYS 120 or PHYS 200 or PHYS 221
Limited Choice course(s) for students completing the Electrical and Manufacturing GA
Students who have decided on an academic program within the Electrical and Manufacturing Career Community should select that program through the Change of Program Request form and follow the coursework outlined for the associated pathway.

Semester IV
Limited Choice course(s) for students completing the Electrical and Manufacturing GA
Students who have decided on an academic program within the Electrical and Manufacturing Career Community should select that program through the Change of Program Request form and follow the coursework outlined for the associated pathway.

Semester V
Limited Choice course(s) for students completing the Electrical and Manufacturing GA
Students who have decided on an academic program within the Electrical and Manufacturing Career Community should select that program through the Change of Program Request form and follow the coursework outlined for the associated pathway.

*LCC makes every effort to limit revisions to the pathways during their effective timeframe. However, the College reserves the right to update certificate and degree titles, and make course changes as needed, without prior notice. The College also reserves the right to discontinue programs when warranted.*