

LOCOMOTIVE ELECTRICAL

Associate in Applied Science

<http://www.sandburg.edu/Academics/Degree-Certificates/Locomotive%20Electrical/index.html>

The program is designated to introduce the student to the basic electrical theory and concepts related to locomotive electrical systems, including the operations, maintenance, and troubleshooting of EMD Low Horsepower locomotive electrical systems. Also, it includes the basic operation, maintenance, repair requirements and trouble shooting of EMD diesel engines and support systems, and the GE Dash 8/9 locomotive systems.

Admission to the Program: Open First-Time Enrollees

1. Complete an application for admission and, if desired, apply for financial aid.
2. Send an official high school transcript or GED score report to the Admissions and Records Office.
3. Complete the placement exam.
4. Meet with an advisor/counselor to select classes and complete the registration process.

Department of Career & Corporate Development

2400 Tom L. Wilson Blvd.
Galesburg, IL 61401
Phone: 309.341.5313

For Additional Information Contact:

The Welcome Center
Phone: 309.345.3500
welcomecenter@sandburg.edu

For Graduation Requirements:

See the graduation policies and procedures (http://catalog.sandburg.edu/academicinformation/#graduation_policies_and_procedures) page for details.

BOC.107 Tech Skills for Business Environment 2 2 3

This course provides students with instruction in basic computer skills including keyboarding, 10- key, file management, data storage and retrieval, collaborative technology, and computer hardware and software. Basic formatting rules for letters, memos, reports and tables will be covered as well as basic word processing concepts and proofreading skills. Spreadsheet and database basic terminology and usage will also be introduced. This course is designed for students who are not majoring in an office occupations program.

Offered: Fall or Spring or Summer

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.
General Education – Not Applicable

ELT.100 Electrical Fundamentals 2 3 3

This course introduces the fundamentals of electrical and electronic circuits. Calculation and measurement of voltage, current, and resistance are emphasized. Through the use of lab activities, various wiring and testing methods utilizing multimeters are investigated.

Offered: Fall and Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

ELT.213 Process Control & Instrumentation 2 3 3

This course covers the field of industrial measurement and control. Data acquisition methods, including the sensing, measuring, and transmission of industrial process variables, are introduced. The principles of automatic process control, measurement, programmable controller and distributed control are studied.

Offered: Spring

Prerequisites: ELT.100 with a grade of C or better.

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

ENG.101 Freshman Composition 1 3 3

This course is the first in a sequence of two freshman composition and rhetoric courses. It is designed for individuals planning to pursue a bachelor's degree as well as those who wish to develop proficiency in writing. Emphasis is on critical reading, organization, logical thought, paragraphing, sentence structure, grammar and punctuation. Also studied will be argumentation and inductive/deductive reasoning.

Offered: Fall or Spring or Summer

Prerequisites: The appropriate placement exam score or ENG.097 with a grade of C or better.

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable. *IAI Course No. C1 900*

General Education – Communications

ENG.120 Report Writing 3 3

This course is designed to teach the basic concepts of report writing for the business and industrial environment. Students will be taught techniques for gathering information, audience analysis, expository writing techniques, information organizational procedures, and methods of achieving a clear style of writing. Students will study routine and non-routine reports, business research reports, and business plans, policies and procedures.

Offered: Spring

Prerequisites: The appropriate placement exam score or ENG.097 with a grade of C or better.

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS, and Certificates where applicable.

General Education – Not Applicable

HYD.101 Hydraulics and Pneumatics 2 3 3

This course is designed for persons who desire to become employed, or upgrade their employment, in any area which demands a basic knowledge about hydraulics and pneumatics. It provides an opportunity to learn the fundamental concepts regarding the transmission of power through liquids and gases. Also, the structure and function of the various pieces of equipment which are used to contain or transfer those liquids or gases are studied, such as pumps, valves, hoses, etc.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

ICT.110 Computer Software Applications 3 3

This course in software applications will provide students with an overview of a computer operating system and commonly used computer software. Students will gain experience with word processing and database management tasks, presentation software, and spreadsheets. Additional software programs associated with the Windows environment will be explored. This course may be used to satisfy the computer requirement common for students planning to transfer to a four-year college or university.

Offered: Fall or Spring or Summer

Prerequisites: AOP.101 or BOC.107 or appropriate articulated high school credit.

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AA, AS, AAS, AGS, and Certificates where applicable.

General Education – Not Applicable Elective Only

MAT.101 Technical Mathematics 1 3 3

This course is designed to serve students enrolled in vocational or technical programs. The emphasis is on skill-building and the applications of mathematics. Topics studied include a review of arithmetic, measurement, approximations, basic algebra, applied geometry, and right triangle trigonometry. Scientific calculators are used and are required of students.

Offered: Fall

Prerequisites: Appropriate placement exam score or MAT.080 with a grade of C or better.

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS, and Certificates where applicable.

General Education – Math AGS Only

MAT.102 Technical Mathematics 2 3 3

This course is a continuation of MAT 101. Topics include linear functions and graphs, laws of sines and cosines, systems of linear equation, exponents and radicals, complex numbers, quadratic equations, logarithms, and other topics from trigonometry. The emphasis is on skill-building and applications of mathematics. A scientific calculator is needed.

Offered: Fall or Spring

Prerequisites: MAT.101

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS, and Certificates where applicable.

General Education – Math

MFG.130 Industrial Safety 1.5 .5 2

This course provides the student with specific instruction to facilitate safe work practices in industrial environments. Students will be introduced to different safety philosophies and terminology. Students will also become acquainted with OSHA policy and with the Right-to-Know laws. Also covered are units specific to fire safety, pressurized gases and welding, electrical hazards, and safe machine usage. Students will have the opportunity to earn the OSHA ten-hour safety certification.

Offered: Fall or Spring or Summer

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

MTL.101 Machine Tool Fundamentals 1 2 2 3

This course provides a basic introduction to machine tools with the primary emphasis on the engine lathe, drill press and hand tools common to the machinist trade.

Offered: Fall

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS, and Certificates where applicable.

General Education – Not Applicable

MTL.103 Manufacturing Processes 2 2

This course is designed to familiarize the student with the basic processes that are common to industry and the techniques used in the manufacturing of a product.

Offered: Fall

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS, and Certificates where applicable.

General Education – Not Applicable

PSY.101 Introduction to Psychology 3 3

This course is designed to provide an understanding of a variety of topics within the field of psychology. It is not only designed for students planning on majoring in psychology, but for those who have an interest in the scientific basis of behavior, thought, and the physiological processes that underlie each.

Offered: Fall or Spring or Summer

Prerequisites: The appropriate placement exam score, or ENG.097 with a grade of C or better or an ACT Reading score of 20 or higher.

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable. *IAI Course No. S6 900*

General Education – Social Science

PSY.107 Positive Psychology 3 3

Positive Psychology will encourage students to develop their potentials through research-based applications found in the areas of resiliency, adjustment, and positive emotions. This course will provide insights into strength-based behaviors by examining biological, psychological and sociocultural origins.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits: AA, AS, AAS AGS and Certificates where applicable.

General Education – Not Applicable Elective Only

RDG.120 Strategies for Success in College 3 3

This course will introduce students to strategies that promote success in college. Students will explore internal factors that influence success in college, including learning styles, educational objectives and personal expectations. External factors, including locus of control and generational influences will also be explored. Students will also be introduced to the specific skill sets necessary for success in college, including time-management skills, critical thinking and reading skills, test-taking skills, goal-setting skills and problem solving skills. Students will also be introduced to college resources when appropriate.

Offered: Fall or Spring

Prerequisites: The appropriate placement exam score, or ENG.097 with a grade of C or better, or an ACT Reading score of 20 or higher.

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AA, AS, AFA, AAS, AGS, and Certificates where applicable.

General Education – Not Applicable Elective Only

RRT.101 History of Railroading 3 3

This course covers the history and traditions of railroading and the industry's role in North American economic development. Upon successful completion of this course, students will be able to list and explain the significance of major events in North American railroading.

Offered: Fall

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

RRT.120 Introduction to Railroading 1 1 1.5

This course introduces the learner to the different classes of railroad operations, the railroad environment to include terminology and railroad language, and the overall railroad workplace environment.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

RRT.137 Locomotive Air Brakes 2 3 3

This is one in a series of courses in the Locomotive Mechanical certificate and AAS programs. It is designed to provide the student an introduction to the operation, testing, maintenance, and troubleshooting for 26L and 30 ACDW locomotive air brake systems.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

RRT.138 Locomotive FRA 2 3 3

This is one in a series of courses in the Locomotive Mechanical certificate and AAS programs. This course is designed to introduce the student to the Federal Railway Administration and Department of Transportation Code of Federal Regulations Title 49, Parts 209, 218, 229, 231, and 232.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

RRT.142 Locomotive Electricity 2 3 3

This course is designed to introduce the student to the basic electrical theory and concepts related to locomotive electrical systems.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate - AAS, AGS and Certificates where applicable.

General Education – Not Applicable

RRT.143 Low Horsepower Electrical 2 3 3

This is one in a series of courses in the Locomotive Electrical certificate and AAS programs. This course is designed to introduce the student to the operation, maintenance, and troubleshooting of EMD Low Horsepower locomotive electrical systems.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate - AAS, AGS and Certificates where applicable.

General Education – Not Applicable

RRT.144 EMD Basic Electrical 2 3 3

This course is designed to introduce the student to the basic operation, maintenance, repair requirements and trouble shooting of EMD diesel engines and support systems.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS, and Certificates where applicable.

General Education – Not Applicable

RRT.145 GE Dash 8/9 Electrical System 2 3 3

This course is designed to introduce the student to the basic operation, maintenance, repair requirements and trouble shooting of GE Dash 8/9 locomotive systems.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

RRT.165 Rail Safety Quality & Environment 3 3

This course discusses safety, quality, personal health and environmental awareness as it relates to the railroad industry. Emphasis is placed on the basic tools and techniques for improving these conditions on the job. Discussion will include the management of a hazardous materials handling program.

Offered: Fall or Spring

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AAS, AGS and Certificates where applicable.

General Education – Not Applicable

SOC.101 Introduction to Sociology 3 3

The purpose of this course is to acquaint the student with the discipline of sociology as it applies to contemporary American society. This course provides an orientation to the student interested in social science or the helping professions. Among specific topics to be studied are: how the sociologist gathers information, the importance of culture and symbols, personality development, the changing structure of the family, social class and inequality, race and ethnicity, and deviant behavior.

Offered: Fall or Spring or Summer

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate; AA, AS, AFA, AAS, AGS, and Certificates where applicable. *IAI Course No. S7 900*

General Education – Social Science Human Relations

SPE.110 Interpersonal Communication 3 3

This course attempts to develop an awareness of, and an insight into, the choices that are made by participation in face-to-face, non-public, human communication. The text and lectures are designed to create an understanding of theories and principles. Experiential exercises encourage the student to apply this understanding, and to use it in interpreting his/her own and other people's attempts at communication. Among the topics covered are the communication process, the self as a communicator, verbal and nonverbal language, cooperation and conflict, etc. This course is intended for persons planning to pursue a baccalaureate degree and those who desire to improve their verbal communication.

Offered: Fall or Spring or Summer

Applicable toward graduation at Sandburg where program structure permits:

Degree or Certificate: AA, AS, AAS, AGS, and Certificates where applicable.

General Education – Not Applicable Elective Only Human Relations

Course	Title	Semester Hours
First Year		
Fall Semester		
ELT.100	Electrical Fundamentals	3
MAT.101	Technical Mathematics 1	3
MFG.100	Introduction to Welding	3
MFG.130	Industrial Safety	2
MTL.101	Machine Tool Fundamentals 1	3
MTL.103	Manufacturing Processes	2
Spring Semester		
HTH.130	First Aid	2

RRT.142	Locomotive Electricity	3
RRT.143	Low Horsepower Electrical	3
RRT.144	EMD Basic Electrical	3
RRT.145	GE Dash 8/9 Electrical System	3
Total Semester Hours		30

Kellogg, David M

associate dean of career & corporate development

The Center for Manufacturing Excellence (CME) offers classroom space, a computer lab, and houses Carl Sandburg College's industrial programs. Students may take courses in the following subject areas: welding, biofuels, rail, machine tooling, manufacturing or electrical. The electrical lab features a host of components to aid in student learning including AC/DC trainers. In 2014, Sandburg became a designated National Academy of Railroad Sciences (NARS) training site offering courses in locomotive electrical and locomotive mechanical. Instruction is delivered by individuals with industry-specific expertise and includes specialized coursework using technical equipment. Two diesel engines inside the CME are available for training opportunities. The College's welding lab offers 16 bay stations and soon will have an additional ten working spaces. The welding area offers a welding simulator, as well as state of the art multi-process welding machines.