RAILROAD ENGINEERING TECHNOLOGY COURSE DESCRIPTIONS

EET* 103 Fundamentals of Electricity
Surveys basic electricity, including generation, measurement, and analysis of networks involving DC and AC sources. The laboratory component includes electrical experiments in basic DC and AC circuits.

EET* 110 Electric Circuits I
Introduces DC and AC circuit fundamentals, including Ohm's Law Kirchoff's Laws power and energy relationships. Students will learn to analyze DC and AC series, parallel, and series-parallel circuits using basic circuit analysis techniques. Students will also learn the fundamentals of capacitors, inductors and transformers and analyze DC and AC circuits with these components. In the lab, students will learn to use instrumentation including power supplies, analog multimeters, digital multimeters, function generators, counters and oscilloscopes. Students will also construct a variety of circuits and utilize basic circuit analysis techniques to analyze these circuits.

MEC* 234 Electromechanical Controls
Introduces the student to the fundamentals of electric circuits and electrical machinery emphasizing DC/AC single and polyphase motors and generators. Presents electrical methods of manual and automatic control of mechanical systems. The laboratory portion covers motors, control systems, digital logic, and applications. Emphasizes the organization, report, and interpretation of test data in a written report for each experiment.

RET* 101 History of Railroading
Covers the history and traditions of railroading and the industry's role in the North American economic development.

RET* 110 Careers in the Railroad
Provides information about technical careers in railroading to assist students to choose suitable career paths. Requires field trips that will demonstrate the relationships among technical work groups in day to day railroad operations.

RET* 120 Railroad Rules, Regulations, Standards & Practices
Provides participants with an overall understanding of governmental rules, regulations, standards, and practices as they apply to a railroad operation. Study includes a review of Code of Federal Regulations, Part 49, Railroad Standards and Practices Manual (AREMA) and various railroads' book of rules.

RET* 220 Safety in the Railroad Workplace
Covers the principles and policies governing railroad safe work practices. Upon successful completion of this course, the student should be able to describe safety policies, including the application of team processes, use and care of personal protective equipment, lockout/tag out procedures, and hearing conservations.

RET* 230 Reading and Interpreting Railroad Diagrams
Provides participants with an overall understanding of how to read and interpret railroad electrical diagrams. Course topics will include a review and discussion of the following: ladder diagrams, contractors, motor starters, motors, programmable logic controller, railroad electrical symbols.

RET* 240 Railroad Pneumatics and Hydraulic Controls
Introduces participants to the basic components, controls and functions of railroad pneumatics and hydraulics. Course topics include standard symbols, pumps, control valves, control assemblies, actuators, maintenance procedures and switching and control devices.

RET* 242 Railroad HVAC Systems
Provides participants with an overview of HVAC systems used on railcars. Basic hand and specialty tools and equipment will be covered as well as basic laws of heat transfer, thermo-dynamics and heat load. The study of the basic refrigeration cycle and its components will be introduced. In addition, students can qualify to obtain certification on the proper handling of refrigerants to include their effects on the environment.

RET* 244 Railroad Electro-mechanical Troubleshooting
Introduces participants to the tools, methods and techniques for troubleshooting electro-mechanical problems in machines and rolling stock equipment (trains).

RET* 250 Railroad Signaling & Switching
Provides participants a basic understanding of a railroad signal system, including track circuits and applicable federal laws/guidelines.

RET* 252 Railroad Communications
Introduces participants to a basic understanding of railroad communications. Course topics include frequency and pulse modulation, AM and FM transmitters and receivers, electromagnetic radiation, digital data communication, and applicable laws and regulations.

RET* 254 Railroad Maintenance, Troubleshooting and Repair
Introduces students to the tools, methods and techniques for troubleshooting signal and communication problems in switch machines and communication equipment.

RET 270 Practicum in Passenger Railroad Technology
Gives the students experience in electric traction motors, catenary wire systems, signaling and track repair using APTA (American Public Transportation Association) standards. Students work closely with railroad employees and under the supervision of a railroad team supervisor.

RET 271 Practicum in Freight Railroad Technology
Gives the students experience in diesel-electric engines, freight railroading logistics and intermodal services, signaling upgrades and track renewal using laser-guided tamping equipment in accordance with Northeast Operating Rules Advisory Committee (NORAC) standards, regularly inspecting and helping with ongoing maintenance of the rail line.

CORE COURSES

COM* 171 Fundamentals of Human Communication (OC)
Emphasizes effective communication skills through a balance of theory and practice in interpersonal, small group, and public speaking contexts. Stresses verbal and non-verbal communication, critical listening, and the processes of preparing and delivering oral presentations.

CET* 116 Computer Applications for Technology

Introduces technology-driven reporting requirements for text, data and graphics, virtual instrumentation, computer simulations for technology problem solving, and determination of computer tools for technology issues. Stresses technical report preparation, including graphical and tabulated analysis of data, with appropriate calculations and conclusions displayed in a variety of formats. Computer skills used to access and apply technical information will also be included.

CET* 126 Computer Servicing

Presents an overview of a microprocessing system with emphasis on hardware design, operation, troubleshooting, and servicing. The lab provides practical experience with electronic troubleshooting techniques. Actual servicing will take place on a basic microcomputing system.

ECN* 101 Macroeconomics

Presents major topics in macroeconomics: markets, households, business, government and foreign sectors, and the effects of the above on employment and national income. Evaluate fiscal and monetary policies and their impact on economic growth of advanced and developing nations.

ENG* 101 Composition

Develops strategies for college-level writing through the critical study of various rhetorical modes. Emphasizes the development of carefully reasoned essays that cite appropriate evidence to support conclusions. Develops library and research skills required for composition and communication. Students will write a number of short expository papers and a longer research paper incorporating MLA documentation techniques.

ENG* 102 Literature and Composition

Emphasizes critical reading and writing by surveying such literary genres as poetry, prose, drama, and fiction. Introduces literary techniques, terminology, conventions, and devices. Students will write a number of short critiques in which they respond to, analyze, and interpret selections from a literature anthology. They will also write a longer literary research paper incorporating MLA documentation techniques.

ENG* 202 Technical Writing

Addresses the conventions of technical writing. Introduces the purposes, developmental strategies, and formats of technical documents. Covers audience analysis and adaptation, document organization and design, graphics, and research documentation methods. Stresses a readable style in all professional writing. Requires a series of short reports, a collaborative project, and a major research paper.

IDS 106 Critical Thinking - Business (CALT)

This thematic Business course meets the Critical Analysis and Logical Thinking competency of the TAP common core. Introduces diverse academic content emphasizing the acquisition of learning strategies to support students in college-level study, while increasing their understanding of community engagement and life-long learning. Focuses on developing creative and critical thinking skills, improving written and oral communication, setting personal and academic goals, and becoming engaged members of the community. This will be accomplished through in-class seminars, workshops, and service-learning initiatives. In addition, students will develop a comprehensive academic and career development plan.

MAT* 115 Mathematics for Science and Technology
Presents basic mathematical concepts needed in the science and technology fields. Includes scientific notation, English and metric systems, solutions to first- and second-degree equations, systems of equations, logarithms, elementary geometry, statistics, graphing, and trigonometry. Introduces the scientific calculator.

PHY* 109 Fundamentals of Applied Physics
Introduces the principles of physics, including measurement, motion, forces in one dimension, concurrent forces, work and energy, simple machines (including mechanical advantage), rotational motion, and nonconcurrent forces. of laboratory.