

Advanced Manufacturing Technician (AMT) Curriculum Course Descriptions

March 23, 2017

Fall – Semester 1

IET 1020. ENGINEERING TOOLS AND DIMENSIONAL ANALYSIS. Principles and practices of measurement technology; use of tools; dimensional analysis; and the use of all the above in applications of technology.

IET 1400. TECHNICAL DRAFTING I. Introduction to drafting, with computer-aided drafting (CAD) applications. Orthographic projection, geometric construction, sectioning, dimensioning, auxiliary views, and text. Includes display and editing techniques as well as working with drawing files.

EET 1300 / 1301. ELECTRICAL PRINCIPLES I / LAB. Principles governing current, voltage, resistance and power in DC circuits. Series, parallel, and series-parallel circuits. Network theorems.

UNIV 1000. THE UNIVERSITY EXPERIENCE. This course is designed to ease students' transition to the University experience. The focus is primarily on career development, the academic advising process, and academic regulations/requirements. New students will be exposed to a wealth of University programs and services, including, but not limited to: engagement in student affairs, financial aid regulations, Department of Education compliance, and awareness of the numerous student organizations and activities at Northwestern State University.

ENGL 1010. COMPOSITION AND RHETORIC (ON-LINE). The short paper; rhetoric, with emphasis on writing.

MATH 1020. COLLEGE ALGEBRA. A graphing treatment of the essential topics of college algebra with emphasis on functions, graphing, and applications.

ADMT 1100. SAFETY CULTURE. Introduces the importance of cultivating daily safe work habits and the predictable negative results of not being safety conscious in the work place. Instructs the students in basic safety culture and prepares them to participate in, conduct, and lead safety walk-throughs. Introduces the student to Hazard Prediction Training. Prepares the student to conduct risk assessment activities, construct safety boards, and formulate individual safety commitments.

Spring – Semester 2

IET 2400. TECHNICAL DRAFTING II. Continuation of IET 1400, with intermediate CAD applications. Working drawings, limit dimensioning, threads and fasteners, secondary auxiliary views, descriptive geometry, assembly drawings, and production illustrations.

EET 1320 / 1321. ELECTRICAL PRINCIPLES II / LAB. Alternating current. Capacitors, inductors, and impedance. AC circuit analysis theorems and techniques.

MATH 1090. TRIGONOMETRY. Trigonometric functions; relations between functions; solution of triangles with applications to practical problems; trigonometric formulas and identities; radian measure; graphic representation of trigonometric functions; inverse trigonometric functions, trigonometric equations.

COMM 1010. FUNDAMENTALS OF SPEECH. Development of desirable habits for normal speech situations; effective use of voice, oral language, and bodily actions; basic principles of speech composition.

ADMT 1110. WORKPLACE ORGANIZATION (5S). Introduces the fundamental 5S process involving the five-step progression of sort, set in order, shine, standardize and sustain. Instructs the students in the sequence involving classifying and sorting, ordering and aligning, cleaning and sweeping up, standardizing, and developing a process of

sustainable practice in the workplace. Fosters the development of a workplace organization in which safety and efficiency are always paramount.

ADMT 1115. FLUID POWER. Explains the fundamental concepts of fluid power and electro-fluid power systems, primarily with pneumatic and hydraulic systems. Covers the principles of fluid power, calculations of physical properties of fluids and their ability to do work. Introduces the various fluid power components, symbols, circuits. Introduces troubleshooting of fluid power components and systems with an emphasis on safety. Addresses fluids, filters, reservoirs, piping, pumps, actuators, accumulators, control valves, and combination circuits.

Summer – Semester 3

EET 1330 / 1331. DIGITAL ELECTRONICS I / LAB. Logic functions, logic gates, number systems and conversions, Boolean algebra, logic simplification, combinational circuits, programmable logic devices, and flip-flops. Analysis and design of basic digital logic circuits.

ENGL 1020. COMPOSITION AND RHETORIC II (ON-LINE). Writing the longer paper; diction, style, analysis and interpretation of collateral readings leading to the composition of the research paper.

ADMT 1120. INTRODUCTION TO ELECTRIC MOTOR CONTROLS. An introduction to basic manual and push button motor control systems. Topics include an understanding of ladder logic and its various components, and basic motor and control installations.

ADMT 1125. WELDING FOR MAINTENANCE. Provides basic instruction needed for student to weld using SMAW (Stick), GMAW (MIG), GTAW (TIG), and Oxy-Fuel processes.

ADMT 1200. LEAN MANUFACTURING. Instructs the student in the concepts of value-added product, maintenance value-added product, value-added work and necessary work. Explains the process of how a business earns profit. Demonstrates the Toyota Production System for Maintenance using the House framework. Describes and explains Muda (waste), Muri (overburden) and Mura (unevenness) as well as the seven Muda waste areas (overproduction, waiting, transporting, inappropriate processing, unnecessary inventory, unnecessary / excess motion and defects) and their relationship to maintenance and production.

Fall – Semester 4

IET 2920. SPECIAL PROBLEMS. Problem Solving I. Introduces the Toyota Business Practice model, the 8 step Toyota Problem Solving method, and the 10 part Toyota Drive and Dedication model. Instructs the students to clarify the problem, break it down to analyze it, set achievable targets, analyze the root cause, develop countermeasures, evaluate results and the process, standardize the results, and learn from failures. Fosters the development of a customer first philosophy involving all the stakeholders.

EET 2320 / 2321. BASIC ELECTRONICS / LAB. Principles of semi-conductor devices and circuits. Design and analysis of diode and bipolar junction transistor in switching and amplifier circuits.

FA 1040. FINE ARTS. The fine arts (music, visual art, drama, and dance) as they relate to the human experience.

SCI 1010. BASIC CONCEPTS OF PHYSICAL SCIENCE I. Basic concepts of physics and chemistry.

ADMT 1210. PROGRAMMABLE LOGIC CONTROLLERS. Introduces Programmable Logic Controllers (PLC) and elements needed for an automated industrial control system. Introduces memory and project organization within a PLC and provides instruction in basic numbering systems, computer and PLC terminology. Introduces PLC control functions, program structures, language standards, wiring and troubleshooting methods, as well as, real world

communications. Requires the student to program a PLC which may include a combination of ladder logic, structured text, sequential function chart and/or function block languages. Includes various protocols of industrial communications used between PLC controlled machines, PLC to PLC, PLC to computer, and computer to computer.

Spring – Semester 5

IET 2020. METALS MACHINING I. Machine tool technology; operator control and computer numerical control (CNC) machining, computer-aided manufacturing (CAM), and production centers. Precision measurement and layout. Survey of nontraditional machining processes.

EET 3320. ELECTRIC MOTOR CONTROLS. Theory of operation of electric motors with emphasis placed on ac motors in terms of circuit diagrams and safety. Basics of industrial motor controls, sensors and control devices, electronic control of direct-current (DC) motors, electronic control of alternating-current (AC) motors, manual contactors, magnetic motor starters, and installation of control devices and maintenance procedures.

SCI 1020. BASIC CONCEPTS OF BIOLOGICAL SCIENCE I. Chemical basis of life, cell structure and specialization, cellular respiration, photosynthesis, patterns of inheritance, nature and action of genes, simplified classification and evolution of plants, and organismic processes.

PSYC 1010. GENERAL PSYCHOLOGY. Principles of psychology; human behavior; shaping of behavior and personality by interaction between individual and environment.

ADMT 1230. INTEGRATED CONTROL SYSTEMS. Develop skills on the manufacturing cell line to integrate the function and application of hydraulic, pneumatic, mechanical, electrical and robotic components with the use of programmable logic controllers and other control devices, including Human Machine Interface (HMI) operator display panels.

ADMT 1240. PROBLEM SOLVING II. Student teams apply their technical, problem solving, presentation and communication skills to address a manufacturing process improvement and present their project to a panel of manufacturing officials. Successful presentations will incorporate prior learning outcomes into a single integrated learning experience.

ADMT 1250. MAINTENANCE RELIABILITY. Introduces the Toyota Maintenance Reliability training. Describes the difference between corrective maintenance and preventive maintenance. Breaks down proactive maintenance and the underlying tools and constituent processes. Instructs the students in the various individual units in a system and the steps in evaluating failure mode risks and countermeasures.

Courses noted with ADMT are provided through the Central Louisiana Technical Community College. All other course content is provided through Northwestern State University (NSU). Enrollment for all courses in the Advanced Manufacturing Technician (AMT) program curriculum is with NSU.

These course descriptions are considered unofficial and subject to change. These descriptions are provided in this format to allow for ease of use and understanding of the course content for the AMT program. For the official updated course descriptions, please review to the NSU course catalog which can be found on-line through www.nsula.edu.