Automotive Technology

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Automotive Technology Department
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School of Engineering Technology

Associate in Applied Science Degree

The automotive industry provides employment in the experimental development of gasoline, diesel and turbine powered vehicles and equipment, and their sales and service. Other mechanical, electrical, and fluid power oriented industries and operations provide similar employment.

Courses are designed to prepare the technician graduate for direct entry into automotive and other industries or consumer oriented employment. Many past graduates have continued their studies in a Bachelor's Degree program in Automotive Management, Engineering Technology, Industrial Technology, Engineering and other related fields.

Each student is assisted in selecting and achieving his/her goal through guidance provided by a faculty member who has a broad background of experience and technical preparation, and a genuine interest in the student's success.

Typical Employment Opportunities:

Automotive Diagnostician
Equipment Designer and Installer
Warranty Processor
Research and Development Technician
Writer-Technical Literature
Dealership: Parts, Sales and Service
Service Instructor
Insurance Adjuster

Automotive Technology (AAS) Program Outcomes:

• Graduates will have the technical skills, knowledge and ability to enter their chosen Automotive Technology discipline.
• Graduates will have good written and oral communication skills.
• Graduates will develop and be able to maintain the necessary knowledge to operate within all areas of land, sea and air (ground support) vehicles, equipment, facilities, service and operations.

This program is accredited by the Association of Technology, Management and Applied Engineering, 1390 Eisenhower Place, Ann Harbor, MI 48108, 734-677-0720 www.atmae.org

Fall 2017- Subject to Revision
Liberal Arts and Sciences (28 credits)

EGL 101 Composition I: College Writing (GE) 3
EGL 102 Composition II: Writing About Literature 3
Social & Behavioral Science (GE) 3
History Elective 3
MTH 129 Precalculus with Applications (GE) 4
MTH 130 Calculus I with Applications (GE) 4
PHY 135 College Physics (GE) 4
PHY 136 College Physics II (GE) 4

Please refer to the General Education and Writing-Intensive Requirement Sections of the College Catalog and consult with your advisor to ensure that graduation requirements are satisfied.

Support Courses (3 credits)
MET 104 Comp Aided Drafting & Design (CADD) 3

Required: Automotive (33 credits)
AET 101 Internal Combustion Engine Theory and Servicing 3
AET 106 Suspension and Control Systems 3
AET 107 Manual Drivetrains and Driveaxles 3
AET 150 Automotive Computer Applications 2
AET 208 Automotive Electrical Applications 3
AET 215 Diesel Engines 3
AET 217 Applied Mechanics and Engineering Materials 3
AET 218 Applied Manufacturing Processes 2
AET 255 Computerized Engine Controls 3
AET 257 Automatic Transmissions 3
Technical Elective: 5
(AET, EET, IND, MET, BUS)

Total Credits: 64

Degree Type: AAS
Total Required Credits: 64

Course Descriptions

EGL 101 Composition I: College Writing (GE)
This is the first part of a required sequence in college essay writing. Students learn to view writing as a process that involves generating ideas, formulating and developing a thesis, structuring paragraphs and essays, as well as revising and editing drafts. The focus is on the development of critical and analytical thinking. Students also learn the correct and ethical use of print and electronic sources. At least one research paper is required. A grade of C or higher is a graduation requirement. Note: Students passing a departmental diagnostic exam given on the first day of class will remain in EGL 101; all others will be placed in EGL 097. Prerequisite is any of the following: successful completion of EGL 097; an SAT essay score (taken prior to March 1, 2016) of 7 or higher; an SAT essay score (taken after March 1, 2016) of 5 or higher; on-campus placement testing. Credits: 3

**EGL 102 Composition II: Writing About Literature**
This is the second part of the required introductory English composition sequence. This course builds on writing skills developed in EGL 101, specifically the ability to write analytical and persuasive essays and to use research materials correctly and effectively. Students read selections from different literary genres (poetry, drama, and narrative fiction). Selections from the literature provide the basis for analytical and critical essays that explore the ways writers use works of the imagination to explore human experience. Grade of C or higher is a graduation requirement. Prerequisite(s): EGL 101 Credits: 3

**MTH 129 Precalculus with Applications (GE)**
This is a precalculus course with applications from various disciplines including technology, science, and business. Topics include families of functions, mechanics of functions, exponential and logarithmic functions, trigonometric functions and complex numbers. The emphasis is on applications and problem solving. A graphing calculator is required. Note: Students completing this course may not receive credit for MTH 117. Prerequisite(s): MP3 or MTH 116 Credits: 4

**MTH 130 Calculus I with Applications (GE)**
This is a calculus course for those not majoring in Mathematics, Engineering Science or Computer Science. Topics include the derivative, differentiation of algebraic, trigonometric, exponential and logarithmic functions, applications of the derivative and the definite integral. Applications are taken from technology, science, and business. Problem solving is stressed. A graphing calculator is required. Note: Students completing this course will not receive credit for MTH 150. Prerequisite(s): MP4 or MTH 117 or 129 Credits: 4

**PHY 135 College Physics (GE)**
An integrated theory/laboratory general college physics course without calculus. Topics will include fundamental concepts of units, vectors, equilibrium, velocity and acceleration in linear and rotational motion, force, energy, momentum, fluids at rest and in motion, and oscillatory motion. Laboratory problems, experiments and report writing associated with the topics studied in the theory are performed. Prerequisite(s): MTH 129 Corequisite(s): PHY 135L Credits: 4

**PHY 136 College Physics II (GE)**
A continuation of PHY 135. Topics will include heat, electricity, magnetism, light and optics. Prerequisite(s): PHY 135 Corequisite(s): PHY 136L Credits: 4

**MET 104 Comp Aided Drafting & Design (CADD)**
This course introduces computer aided drafting and design (CADD) in 2D drafting and 3D solid modeling. Students will learn traditional drafting techniques, such as orthographic projection, dimensioning, and tolerancing, and apply their drafting skill though 2D CAD software. Students will also learn 3D solid modeling based on parametric constraints, dimensions and features such as extrude, revolve, sweep, loft, hole, fillet and shell. In addition, the course teaches students how to create assemblies and 2D engineering drawings from the existing 3D solids. Laboratory exercises will be assigned to the students for hands-on experience with the related topics. This course is equivalent to the combination of GPH103, GPH104, and MET211. Corequisite(s): MET 104L Credits: 3
AET 101 Internal Combustion Engine Theory and Servicing
This is a theory/laboratory course designed to introduce the student to basic heat engine types, their physical configurations and various engine operating cycles. Analytic pressure-volume diagrams are utilized to illustrate the effects of gasoline engine design on performance and combustion requirements. Topics discussed include design, construction, inspection techniques and servicing of the internal combustion engine and its components. Laboratory activities are performed to provide relevant hands-on experience to the students. Also engine aspiration, combustion using the principles of fluid dynamics and thermodynamics, volumetric efficiency and fuel metering systems will be discussed in this course. Corequisite(s): AET 101L Credits: 3

AET 106 Suspension and Control Systems
This is a theory/laboratory course designed to provide a thorough understanding of the design, construction and operation of automotive chassis and suspension systems. Topics will include a study of the vehicle frame, suspension, steering, wheels, tires and braking systems. Emphasis is directed to the analysis of the vehicle's systems during operation. Related laboratory activities and demonstrations are included in the required laboratory section (AET106L). Credits: 3

AET 107 Manual Drivetrains and Driveaxles
This is a theory/laboratory course designed to provide a thorough understanding of the vehicle's drive train. Topics will include the design, construction, inspection techniques, and service and associated repair operations of the drivetrain and driveaxle components. The topics will include clutches, propeller shafts, universal joints, CV joints, manual transmissions, differentials and other components used in both front and rear wheel drive systems. Related laboratory activities and demonstrations are included in the required laboratory section. Corequisite: AET 107L Credits: 3

AET 150 Automotive Computer Applications
This is a theory/laboratory course designed to introduce the student to basic computer utilization and programming. Topics include a thorough introduction to personal computers, instruction in and development of basic programming. Students will be required to develop basic programs for technical automotive problem solving and practical automotive applications. Extensive use of the computer laboratory will be provided in the required laboratory section (AET150L). Credits: 2

AET 208 Automotive Electrical Applications
This is a theory/laboratory course designed to introduce the student to basic automotive-oriented electrical principles as they relate to both A.C. and D.C. circuits utilized in contemporary automotive electrical systems. The course also covers automotive electrical and electronic systems and their application. The student is required to utilize and understand the operation of various types of electronic equipment, including both computerized engine and emissions analyzers. Related laboratory activities and demonstrations are included in the required laboratory section (AET 208L). Prerequisite(s): AET 150 or MET 109 Credits: 3

AET 215 Diesel Engines
This is a theory/laboratory course emphasizing in the diesel engine operations and servicing. Topics will include the study of current high-pressure diesel fuel-injection systems and the diesel engine combustion process with respect to fuel injection and combustion changer design. Specific examination of design and performance characteristics of diesel engine air induction, scavenging, supercharging and turbo-charging systems will be covered. Students will also analyze engine governing methods and devices necessary for control, as well as current methods and devices utilized in solving common diesel engine starting problems. Relevant laboratory activities and demonstrations are provided to support the trainings provided during the lecture hours. Prerequisite(s): AET 101 or AET 104 Corequisite: AET 215L Credits: 3

AET 217 Applied Mechanics and Engineering Materials
This course is designed to introduce the fundamental principles of applied engineering mechanics and materials. Topics include forces, couples, equilibrium, friction, kinematics of rectilinear and rotational motion, work, energy and power.
Principles and applications of hydraulics are also discussed. Engineering materials topics include classifications, structure, properties, phase transformation and heat treatment of metals, inspection and testing techniques of automotive engineering materials. Related problem-solving activities are included. Prerequisite(s): PHY 135 and MTH 130 Credits: 3

**AET 218 Applied Manufacturing Processes**
This is a theory/laboratory course designed to introduce the student to basic manufacturing processes and machine tool operations. Topics covered are casting, cold and hot metal forming, machining and joining processes. Related laboratory activities include projects and experiments with technical reports. Individual laboratory projects will be assigned to each student to reinforce the topics covered in the theory. NOTE: Students completing this course may not receive credit for MET 117. Prerequisite(s): AET 101 and AET 107 Credits: 2

**AET 255 Computerized Engine Controls**
This is a theory/laboratory course developed to provide the student with a working understanding of automotive electronics and computerized engine control systems. The course includes computerized fuel and emission control systems, with emphasis on the diagnosis of basic engine malfunctions. The student will also analyze the principles and operation of feedback type systems. Electronic diagnostic equipment is used to identify system malfunctions in order to indicate necessary corrective actions. Laboratory activities provide an opportunity for a practical application of diagnostic procedures on current vehicles which is covered in the laboratory section (AET255L). Prerequisite(s): AET 208 Credits: 3

**AET 257 Automatic Transmissions**
This is a theory/laboratory course dealing with the transmission of power in automobiles, emphasizing contemporary automatic transmissions. Topics covered include applications of the principles of the planetary gear systems, fluids, seals, hydrodynamic drives, hydraulic controls and application devices. The power flow within selected automatic transmissions is discussed and is supported with related activities in the required laboratory section (AET257L). Prerequisite(s): AET 107 Credits: 3

Admission to Farmingdale State College - State University of New York is based on the qualifications of the applicant without regard to age, sex, marital or military status, race, color, creed, religion, national origin, disability or sexual orientation.