DIESEL TECHNOLOGY-AAS

Program Overview

Associate of Applied Science - Diesel Technology

Student Learning Outcomes

The Associate of Applied Science (AAS) in Diesel Technology program provides advanced training in diesel engine maintenance, repair, and operation, preparing students for successful careers in the diesel industry.

Graduates of the AAS in Diesel Technology program will be able to:

- Diagnose and Solve Complex Problems – Use advanced diagnostic tools to identify and resolve performance issues in diesel engines and heavy equipment.
- Master Diesel Engine Systems – Repair and maintain diesel engine components, demonstrating an advanced understanding of engine design, fuel systems, and emissions controls.
- Operate and Maintain Heavy Equipment – Operate and perform preventative maintenance on a variety of heavy equipment, ensuring optimal performance and durability.
- Work with Hydraulic and Pneumatic Systems – Maintain and repair hydraulic and pneumatic systems on mobile equipment, applying principles of fluid dynamics to improve efficiency.
- Utilize Advanced Tools and Technologies – Use and maintain specialized tools and software for repairing, maintaining, and testing diesel engines and heavy equipment.
- Promote Workplace Safety and Compliance – Follow safety practices and meet local, state, and federal regulations to ensure a safe work environment.
- Develop Professional Skills – Communicate effectively with clients, coworkers, and managers, and demonstrate teamwork and leadership in the workplace.
- Prepare for Continued Professional Development – Commit to lifelong learning, stay updated on technological advancements in diesel technology, and pursue further certifications or education as needed.

Formal admission to this program is required.

For more information about any School of Industrial Technology and Workplace Development programs, contact 775-327-2167.

General Education Requirements

English/Communications (two courses required): ENG 100 or ENG 101 and ENG 102 or ENG 107 and ENG 108

ENG 100 Composition-Enhanced **5 Credits**

Allows students to fulfill their first semester of English while completing the remediation process. Designed for students who did not place into ENG 101 on the placement test/writing sample, but did not score so low that they need ENG 95. Allows a student to refine specific skill deficiencies while completing the first semester of freshman composition (ENG 100 is equivalent to ENG 101). Students will have additional Academic Success Center requirements. Although it is a five-credit course, it does not replace ENG 102. After successful completion of ENG 100, a student must take ENG 102 to complete the general education requirement.

ENG 101 Composition I **3 Credits**

Critical reading and writing of the expository essay. Emphasizes pre-writing, strategies for organization, and revision.

ENG 102 Composition II **3 Credits**

Continuation of English 101. Emphasizes writing from sources, argument, the investigative paper, and research techniques.

ENG 107 Tech Communications I **3 Credits**

Basic skills necessary for successful on-the-job communications including improved letter and report writing, persuasion, interviewing, process, mechanism description, and business and technical grammar.

ENG 108 Tech Communications II **3 Credits**

Advanced letter and report writing techniques including proper word choice, tone, and structure. Business letters, memorandums, formal and informal reports, process, and mechanism descriptions.

Mathematics (one course required): Choose from the courses listed below or any higher-level math course. Excludes MATH 389

MATH 116 Technical Mathematics I **3 Credits**

Provides technical mathematical core material so that the student gains practical problem solving experience. May include arithmetic operation, integers, exponents, scientific notation, algebraic expressions, equations, metric system, trigonometry, and logarithms. This course satisfies the general education requirement for occupational/technical AAS degree. It is recommended that students have completed prerequisites within two years of enrolling in this course.

MATH 116E Technical Mathematics Expanded **3-5 Credits**

Provides technical mathematical core material so that the student gains practical problem solving experience. May include arithmetic operation, integers, exponents, scientific notation, algebraic expressions, equations, metric system, trigonometry, and logarithms. This course satisfies the general education requirement for occupational/technical AAS degree.

MATH 120 Fund of College Math **3 Credits**

Includes set theory, logic, consumer mathematics, measurement, geometry, probability, and statistics. Course is broad in scope, emphasizing applications. It is recommended that students have completed prerequisites within two years of enrolling in this course.

MATH 120E Fund of College Math Expanded **3 Credits**

Fundamentals of College Mathematics with Corequisite Support: Includes real numbers, consumer mathematics, variation, functions, relations, graphs, geometry, probability, and statistics. Course is broad in scope, emphasizing applications. Fulfills the lower-division mathematics requirement for a Bachelor of Arts Degree. Satisfies mathematics requirement for baccalaureate degrees.

MATH 126 Precalculus I **3 Credits**

A third course in algebra that stresses polynomial, quadratic, rational, exponential, and logarithmic functions, including their graphs and applications; complex numbers; systems of equations; and basic operations with matrices and determinants, including Cramer's rule. It is recommended that students have completed prerequisites within two years of enrolling in this course.

MATH 126E Precalculus I Expanded **3 Credits**

Precalculus I Expanded with Co-requisite support: Includes equations, relations, functions, graphing; polynomial, rational, exponential, logarithmic, and circular functions with applications; coordinate geometry of lines and conics; analytic trigonometry; matrices and determinants; and binomial theorem. It is recommended that students have completed prerequisites within two years of enrolling in this course.

STAT 152 Intro to Statistics **3 Credits**

Includes descriptive statistics, probability models, random variables, statistical estimation and hypothesis testing, linear regression analysis, and other topics. Designed to show the dependence of statistics on probability. It is recommended that students have completed prerequisites within two years of enrolling in this course.

Science (one course required)

ANTH 102 Physical Anthropology **3 Credits**

Introduction to the study of how humans, Homo sapiens, have emerged as a species and come to dominate the planet by examining processes of human biological and cultural evolution. Topics include inheritance, the emergence of primates, fossil hominids, the development of technology, and biological variability among modern humans. Satisfies general education science.

AST 101 General Astronomy **3 Credits**

An introductory examination of the solar system, stellar systems, and stellar and galactic evolution according to currently accepted concepts. Introduces astronomical instruments and light theory.

BIOL 100 General Biology/Non Major **3 Credits**

Basic biological concepts, interpretation and application of scientific methods, and effects of biological advances on society. Core curriculum science course; cannot be used for credit toward field of concentration in biology.

BIOL 190 Intro Cell/Molecular Biology **4 Credits**

Structure and function of cells. Major molecules of life; composition and physiology of cellular organelles; cell metabolism, reproduction, motility, and gene function of both plant and animal cells. Required for biology majors. Concurrent enrollment in a corresponding lab section is required for this course.

CHEM 100 Molecules/Life Modrn Wrld **3 Credits**

Introduction to chemistry in its many forms and applications, physical and organic, with consideration of environmental and social issues. Includes laboratory activities.

CHEM 121 General Chemistry I **4 Credits**

Fundamentals of chemistry including reaction stoichiometry, atomic structure, chemical bonding, molecular structure, states of matter, and thermochemistry.

ENV 100 Humans and the Environment **3 Credits**

Introduction to the relationship of man and his environment. Current thinking and research concerning the impact of industrialization and urbanization on environmental quality, including the population explosion; the potential decline of the affluent society by the depletion of natural resources; the pollution of air, land surface, and water; and the public agencies and policies designed to solve environmental problems.

GEOG 103 Physical Geog Earth Environmnt **3 Credits**

Physical elements of the earth's natural features and their significance to man. Topics include earth form and motion, landforms, weather, climate, vegetation, and soils. Four laboratory experiences required.

GEOL 101 Exploring Planet Earth **3-4 Credits**

Fundamental principles of geology including tectonic and surficial processes, oceans, atmosphere, environmental applications, and resources. Includes a laboratory component.

NUTR 121 Human Nutrition **3 Credits**

An introductory nutrition course for the beginning student. Course will center on the major nutrients and their roles in maintaining good health. Students will learn to recognize well-balanced diets and acquire shopping tips and preparation techniques for optimum utilization of food dollars. Class includes four required labs.

PHYS 100 Introductory Physics **3 Credits**

A concise treatment of the basic principles of physics. Includes mechanics, matter, electricity, magnetism, heat, sound, light, relativity, and nuclear physics.

PHYS 107 Technical Physics I **3 Credits**
Investigates traditional topics of physics. Topics include mechanics, electricity, basic solid state components, optics, gases, hydraulics, fluids, and thermodynamics. This course provides a basic understanding of how physical systems are related and their technical applications. Hands-on labs, demonstrations, and calculations are an integral part of the course.

PHYS 152 Gen Physics II **4 Credits**
A continuation of PHYS 151. Topics include electrostatics, circuits, magnetism, induction, AC circuits, electronics, light optics, special relativity, and an introduction in quantum theory. Lab included.

U.S. and Nevada Constitutions: HIST 101 and HIST 102 or PSC 101
HIST 101 U.S. History to 1877 **3 Credits**

Survey of U.S. political, social, economic, diplomatic, and cultural development from colonial times through Reconstruction. When taken with HIST 102 satisfies the GBC General Education American Constitutions and Institutions Requirement. HIST 101 and 102 need not be taken sequentially. Either class may be taken alone.
HIST 102 U.S. History Since 1877 **3 Credits**

Survey of U.S. political, social, economic, diplomatic, and cultural development from 1877 to the present. Course satisfies the Nevada Constitution Requirement. When taken with HIST 101 satisfies the GBC General Education American Constitutions and Institutions Requirement. Can be used to satisfy the Nevada Constitution Requirement for out-of-state transfer students who have previously satisfied the United States Constitution Requirement. HIST 101 and 102 need not be taken sequentially. Either class may be taken alone.
PSC 101 Intro American Politics **3 Credits**

A survey of United States, national, state, and local governments with emphasis on the cultural aspects of the governing process. Satisfies the legislative requirement for the United States and Nevada Constitutions.
Humanities or Fine Arts (one course required)
ART 100 Visual Foundations **3 Credits**
A beginning art class that includes a survey of art and the basic components of design. The class explores visual concepts as they relate to the history of art through class presentations, discussions, and a variety of media. Students should plan for three hours of studio work outside the class.

ART 101 Drawing I **3 Credits**
A disciplined foundation in drawing concepts based on visual observation skills.

ART 107 Design Fundmntls I (2-D) **3 Credits**
Explores the fundamentals of design using various media focusing on 2-D design.

ART 160 Art Appreciation **3 Credits**
Introduction to the visual arts, illustrating the place of art in its social and cultural setting.

ENG 203 Intro to Literary Study **3 Credits**
Introduction to the elements of fiction, poetry, and drama used in the analysis of literature.

ENG 205 Intro to Creative Writing **3 Credits**
A creative writing course designed to introduce students to the production of fiction and poetry.

ENG 223 Themes of Literature **3 Credits**
Themes and ideas significant in literature.

FIS 100 Introduction to Film **3 Credits**
Introduction to the historical development of film as art. Considers the development of cinematic techniques (i.e., cinematography, editing, sound, etc.), cinematic genres (i.e., the western, romantic comedy, etc.) and narrative elements (i.e., plot, character, conflict, etc.) as exemplified by the work of major American and international directors.

FREN 111 First Year French I **3-4 Credits**
Development of language skills through practice in listening, speaking, reading, writing, and structural analysis. Language practice required.

FREN 112 First Year French II **3-4 Credits**
A continuation of FREN 111. Language practice required.

HIST 208 World History I **3 Credits**
Survey of world civilizations to 1600. Examines societies, cultures, and issues relative to Africa, the Americas, Asia, Europe, the Middle East and Oceania.

HIST 209 World History II **3 Credits**
Survey of world civilizations since 1600. Examines historical societies, cultures, and issues relative to Africa, the Americas, Asia, Europe, the Middle East, and Oceania.

HUM 101 Intro to Humanities I **3 Credits**
An introduction to humanities through a study of seven major arts including film, drama, music, literature, painting, sculpture, and architecture. Each of these arts is considered from the perspective of historical development, the elements used in creating works of art, meaning and form, and criticism and critical evaluation.

HUM 210 Communicating Diversity **3 Credits**
Communicating Diversity is a lower division course designed to familiarize students with the fundamentals of diversity and how those are expressed through communication. Students will develop a deep understanding of the way in which we communicate race, gender, class, sexual orientation, nationality, religion, and physical/mental ability and how it impacts our daily lives. This course will take an intersectional approach to understanding diversity and seek communication strategies for inclusivity. Emphasis will be placed on defining and developing the critical thinking skills necessary to push past oppression, marginalization, and other issues centralized around diverse populations. Students will be encouraged to investigate and discover diversity issues, solutions, and concepts at the local and global level using case studies, current events, and other significant moments in history.

MUS 101 Music Fundamentals **3 Credits**
Notation, terminology, intervals, and scales. Designed to furnish a foundation for musicianship. Recommended for teachers in public schools and all others desiring a basic music background.

MUS 121 Music Appreciation **3 Credits**
The historical and cultural background of music and origins to the twentieth century.

PHIL 101 Intro to Philosophy **3 Credits**
Basic problems in different areas of philosophy such as ethics, political theory, metaphysics, and epistemology.

PHIL 102 Critical Thinking **3 Credits**
Covers non-symbolic introduction to logical thinking in everyday life, law, politics, science, advertising; common fallacies; and the uses of language, including techniques of persuasion.

PHIL 135 Introduction to Ethics **3 Credits**
Introduction to Ethics: critical introduction to classical and modern ethical theories such as utilitarianism, deontology, and virtue ethics. Emphasis throughout on applying the theories in various contexts such as social, political, or interpersonal. The ultimate goal will be to allow students to clarify their own thinking and positions on important ethical issues confronting society today.

SPAN 111 First Year Spanish I **3 Credits**
Development of language skills through practice in listening, speaking, reading, writing, and structural analysis. Language practice required.

SPAN 112 First Yr Spanish II **3 Credits**
A continuation of SPAN 111. Language practice required.

SPAN 211 Second Year Spanish I **3 Credits**
Considers structural review, conversation and writing, and readings in modern literature.

THTR 100 Introduction to Theatre **3 Credits**
A survey of the basic principles, facts, and theories providing an understanding of the art of theatre. Course also includes a special focus on the practical technical aspects of the theatre and on live theatre experiences.

THTR 105 Introduction to Acting I **3 Credits**
Examines acting fundamentals and focuses on development of vocal, physical, and creative tools to be used on stage.

THTR 121 Stage Makeup **3 Credits**
This course focuses on the history of makeup and basic approaches to applying make-up for the stage and screen. Make-up supplies will be studied, as well as techniques for corrective, old-age, character, stylized, and special effects makeup.

THTR 204 Theatre Technology I **3 Credits**
Lecture and discussion encompassing the philosophy and techniques of technical theatre.

WELD 200 Metal Art **3 Credits**
This course is designed to give the student the basic understanding of two dimensional 2D and three-dimensional 3D metal art. Also covered in this course we will discuss different Cutting, Welding and metal finishing techniques that are used in this discipline as it relates to metal art.

Technology (embedded into the diesel curriculum)
DT 101 Basic Diesel Engines **1-6 Credits**

A review of basic engine operation with an emphasis on operating principles, nomenclature, components, and design, and terminology. May be repeated up to 18 credits.
Program Requirements

DT 100 Shop Practices **.5-4 Credits**

An introduction to hand tool identification and proper use, shop safety, and other topics including screw thread, hydraulic hose, and fitting identification. Also covers measuring devices.
DT 101 Basic Diesel Engines **1-6 Credits**

A review of basic engine operation with an emphasis on operating principles, nomenclature, components, and design, and terminology. May be repeated up to 18 credits.
DT 102 Basic Vehicle Electronics **1-9 Credits**
A lecture and laboratory course study of AC and DC electricity as used in mobile equipment. Emphasis on charging systems, starting systems, lighting systems, and wiring diagrams. Troubleshooting and repairing of electrical components, electronic controls systems, and voltage drops analysis will be covered. May be taught in modules.

DT 105 Mobile Air Conditioning 1-5 Credits

A lecture and laboratory course covering heating and refrigeration theory. Includes heating and air conditioning components, control systems, service evacuation, charging, overhaul, and replacement of major components.

DT 106 Heavy Duty Trans/Power Tr 1-8 Credits

The theory and operation of heavy equipment power trains will be covered in detail with emphasis on power shift transmissions. Students will become familiar with driveline angle calculations, gear ratios, clutches, differentials, and transmission electronic control systems. May be repeated up to eight credits.

DT 201 Diesel Brakes/Pneumatics 2.5 Credits

The principles of pneumatic brake systems are discussed in detail, with emphasis on cam-operated brakes. Pneumatic brake valves, schematic drawings, and foundation brake troubleshooting will be included in this technical course.

DT 215 Electronic Diesel Engines 1-9 Credits

Designed to give individuals knowledge of electronic diesel engine controls as they apply to major diesel engine manufacturers. Emphasis is placed on engine sensors, electronic injection systems, and engine operating systems. No prerequisite but students having experience with diesel engines and basic electronics will find it helpful. Course may be taught in modules.

IT 208 Fluid Power 1-9 Credits

A review of fluid power mechanics with an emphasis on schematic symbols, circuit operation and design, hydraulic component theory and operation, and hydraulic terminology. Course may be taught in modules.

WELD 136 Welding Maintenance Tech I 1-3 Credits

In this course the Maintenance Technician will learn safety in welding and Oxy-Fuel Cutting operations. Also covered in this course, the Maintenance Technician will gain an understanding of electrodes and electrode selection as well as develop an understanding on Shielded Metal Arc Welding equipment that is used in the shop and field environments. The Maintenance Technician will perform the operation of using high alloy electrodes to extract broken bolts. The Maintenance Technician will become knowledgeable in the MSHA and OSHA fabrication regulations regarding hand railing. Repeatable up to three times. (Formerly WELD 135, Welding for the Maintenance Technician I)

WELD 235 Welding Maintenance Tech II 1-3 Credits

The course is designed to give the Maintenance Technician a basic understanding of the principles of the Flux Cored Arc Welding process with hands-on training. The course will also cover the Carbon Arc Cutting process, joint designs, welding symbols, weld testing and inspection. Repeatable up to three times.
Suggested Course Sequence

1st Semester - Fall

Course Credits DT 100 3 DT 102 8 IT 208 8 English/Communications* 3 Mathematics* 3 PSC 101 3 WELD 136 3 Humanities/Fine Arts* 3 TOTAL 34

2nd Semester

Course Credits DT 101 5.5 DT 105 2 DT 106 8 DT 201 2.5 DT 215 8 English/Communications* 3 Science* 3 WELD 235 3 TOTAL 35