DIESEL TECHNOLOGY (DESL)

DESL S101 Introduction to Heavy Duty Mechanics
3 credits (2+2)
This introductory course gives the student a look into the world of heavy duty mechanics. Students rebuild a diesel engine, operate heavy duty equipment, and take field trips to local shops. Note: Only accepted for elective credit if completed before applying to the Diesel program.

DESL S102 Lubrication, Preventative Maintenance, and Inspections
2 credits (1+2)
Prepares students to effectively perform visual inspections and preventative maintenance operations at different levels on machines. Also covers proper lubricants, fluids, and fittings. Types and uses of machines, proper tooling, basic mechanical systems, and safety are stressed. Introduction to various machine systems and adjustments are included.

DESL S106 Diesel Engines Simplified
3 credits (2.5+1.5)
Designed for the owner/operator of a diesel engine in a boat, pick-up, or other application, this course will familiarize students with diesel engine operation, maintenance, and minor repairs. At least half of each class period is spent working on real diesel engines in our well equipped lab. No tools or previous mechanical experience is needed. Learn to be comfortable owning or operating your diesel engine.Pass/Fail grading.

DESL S107 Diesel Fuel Systems
4 credits (3+2)
Diesel injection systems will be covered in detail including mechanical pumps and injectors through current electronic common rail fuel systems. Diesel emission control systems and diesel intake air systems will also be covered. Introduction to essential electronic theory including use of scan tools in the diagnostic process combined with use of Internet-based service information systems.
Prerequisite: DESL S121 or instructor permission.

DESL S110 Diesel Engines
6 credits (2.5+7)
This course covers all aspects of diesel engines that are used in modern heavy equipment including marine, truck and stationary applications. Troubleshooting, repair, parts reuse, and engine rebuilding are included. One full day each week is spent in the lab rebuilding a diesel engine. Students can bring their own diesel engine to rebuild with the permission of the instructor.

DESL S121 Basic Electrical Systems
3 credits (2+2)
Covers history and origins of electrical theory through the generation of electricity. Includes diagnosis, minor repair and general service of alternators, starters and batteries.

DESL S125 Basic Hydraulics
3 credits (2.5+1)
Basic laws governing hydraulic design, layout and application. Introduction to components to include: disassembly and reassembly of pumps, motors, control valves and cylinders. Understanding of hoses, pipe fittings, seals and gaskets.

DESL S130 Refrigeration and Air Conditioning
2 credits (1+2)
This class will cover application, system operations, maintenance and safety principals of refrigeration. Students will learn about components making up a refrigerant. Troubleshooting and avoiding common problems included.

DESL S131 Electrical II
3 credits (2+2)
Theory, diagnosis, and repair of automotive electrical systems, to include testing tools, schematics, and computers.
Prerequisite: DESL S121 or concurrent enrollment.

DESL S140 Construction Drawing Interpretation
3 credits (3+0)
Students will learn to read all aspects of construction drawings including but not limited to: site and floor plans, elevation, electrical and mechanical drawings. Details within construction drawings will be covered extensively such as scale and scales, exploded drawings, dimensions, lines, notes and symbols. An introduction to computer-aided drafting (CAD) will also be taught.

DESL S141 Precision Measuring Tools
2 credits (1+2)
Provides the fundamentals for using precision measuring tools such as micrometers and dial indicators, as well as lasers used in leveling and alignment. Also covers the use of testing instruments including digital multimeters, tachometers, with an introduction to thermal imaging.

DESL S142 Piping Systems
3 credits (2+2)
Pipe types and piping systems identification are taught. Safety around high pressure systems is stressed. Installation and repair of pipe components including pumps, valves, gaskets, seals, and coupling systems will be covered. Basic pipe layout and routing will be practiced.

DESL S143 Industrial Rigging Principles
2 credits (1+2)
Learn the industrial skills needed for safely lifting and moving heavy objects and equipment of different shapes, sizes and weights. The different tools and equipment needed to perform this type of work safely will be taught in theory and practice.

DESL S144 Conveyor and Drive Systems
3 credits (2+2)
Covers all aspects of mounting and installing drive and driven equipment and machines: location and setting of baseplates, prealignment and mounting of the equipment, installing and adjusting of the different types of drive coupling systems, and final adjustment and alignment. Conveyor belt systems will also be covered with an emphasis on conveyor safety. The student will learn the uses, installation, adjustment and maintenance of the different types of conveyor systems.

DESL S180 AC Power Generation
3 credits (2+2)
Study of AC power generation methods used in marine and industrial applications. The interface of diesel engines to power generation is strongly emphasized. Covers AC generation theory, safety, regulation, installation, troubleshooting, and repair of the types of units commonly used in Southeast Alaska.
Prerequisite: DESL S121.

DESL S225 Advanced Hydraulics
3 credits (2+2)
Advanced hydraulics systems incorporating variable displacement pumps, proportional control valves, hydraulic load sensing systems, and hydrostatic power trains. Schematic interpretation, testing, and adjusting of hydraulic and electronic controls are emphasized. Course includes classroom and hands-on labs.
Prerequisite: DESL S125 or concurrent enrollment.

DESL S250 Heavy Duty Brakes
2 credits (1+2)
An in-depth study of the various types of braking systems used in current trucks and heavy equipment applications.

DESL S255 Heavy Duty Suspension and Alignment
2 credits (1+2)
A thorough study of heavy equipment frames and suspension systems and their components. Adjustments, repairs and cautions along with tire and track alignments.

DESL S260 Heavy Duty Power Trains
3 credits (2+2)
Basic operation and repair of heavy equipment components from the flywheel to the wheels or tracks: clutches, transmissions, transfer cases, differentials, multi-speed rear ends, and final drives.

DESL S261 Marine Auxiliary Systems
3 credits (3+0)
Mechanical and electrical systems on pleasure and commercial vessels. Includes engine installation, shaft alignment, propeller calculation, fuel and water systems, and other marine system design and installation. Should be taken concurrently with DESL S262.

DESL S262 Marine Auxiliary Systems Lab
2 credits (0+4)
Supplements DESL S261 with specific exercises. Engine, shaft and propeller, exhaust, electrical and other systems are designed, installed and tested. Should be taken concurrently with DESL S261.

DESL S263 Marine Transmissions
3 credits (1+4)
A study in the operation, maintenance and repair of marine transmissions and other shipboard gearing units like winches and stern drives.

DESL S291 Diesel Technology Internship
1-9 credits (variable 0+0+4-36)
An Internship in Diesel Technology that is experience based. Students are placed with an organization with both a professional within the organization and a faculty member from the academic department. Students are required to satisfactorily complete four hours per week for each credit registered for the duration of the semester.