

# APPLIED INDUSTRIAL TECHNOLOGY (OPERATING ENGINEERS) (ATOE)

## ATOE-1100 Operating Engineering Concepts 4 Credits

Basic concepts of compaction, compaction equipment, design of paving operations, and design concepts of asphalt and skid steer loaders. Tractor-scraper and oiler responsibilities also included.

*Lecture: 4 hours*

*Prerequisite(s): Departmental approval: admission to any Applied Industrial Technology program.*

## ATOE-1200 Basic Mechanical Concepts 3 Credits

Introduction to analysis of fuels, components and principles of fuel systems, common units, air intake systems, cooling system designs and maintenance, hydraulic systems including Pascal's law, basics of engine electrical systems, history, development and theory of internal combustion engines. Discussion on function of clutches, basics of power train, use of brakes, and components of tracks and tire construction, selection, maintenance and storage.

*Lecture: 3 hours*

*Prerequisite(s): Departmental approval: admission to any Applied Industrial Technology program.*

## ATOE-1650 Graders and Plans 2 Credits

Introduction to graders operations, safety information fundamentals, terminology and various support grader operations, pre and post operations, methods of finish grading, and fundamentals of construction leveling. Topics include terminology of laser and laser machine controls; proper set-up procedures; safe work practices in the use of lasers and components of laser machine controls; and common highway plans for construction projects including introduction to basic plans, their purpose, and learning how to interpret them.

*Lecture: 2 hours*

*Prerequisite(s): Departmental approval: admission to any Applied Industrial Technology program.*

## ATOE-1700 Paving, Tractor, Backhoe Operations 3 Credits

Introduction to design concepts of paving, identifying operation controls of any hydraulic and loader equipment, basic operations and maintenance safety of equipment, standard and conventional scraper, differentiate one-engine and two-engine scrapers, inspection and start-up, and safety procedures.

*Lecture: 3 hours*

*Prerequisite(s): Departmental approval: admission to any Applied Industrial Technology program.*

## ATOE-2100 Mobile Crane 2 Credits

In-depth focus on mobile cranes. Topics include components and parts, crane signals, communications, operational safety in set-up and OSHA standards and regulations, and using load charts to calculate load weight. Also includes wire rope and rigging, and electrical hazards.

*Lecture: 2 hours*

*Prerequisite(s): ATOE-1100 Operating Engineering Concepts, or departmental approval.*

## ATOE-2200 Mechanical Repair 3 Credits

Study of major mechanical systems. Detailed troubleshooting practice and procedures. Clutch diagnosis and repair, types of power trains and undercarriage maintenance also included.

*Lecture: 3 hours*

*Prerequisite(s): ATOE-1200 Basic Mechanical Concepts, or departmental approval.*

## ATOE-2600 Bulldozer Practice 3 Credits

Study of standard features, standard procedures, tools, inspection, and controls of bulldozers. Topics include attachments, terminology, inspection and controls.

*Lecture: 3 hours*

*Prerequisite(s): ATOE-1650 Graders and Plans, or ATOE-2640 Advanced Grader Practice or concurrent enrollment; or departmental approval.*

## ATOE-2620 Backhoe Practice 3 Credits

Study of standard features, standard procedures, tools, inspection, and controls of backhoes. Topics include attachments, terminology, inspection, and controls.

*Lecture: 3 hours*

*Prerequisite(s): ATOE-1700 Paving, Tractor, Backhoe Operations, or departmental approval.*

## ATOE-2640 Advanced Grader Practice 3 Credits

Study of standard features, standard procedures, tools, inspection, and controls of graders. Topics include attachments, terminology, inspection and controls.

*Lecture: 3 hours*

*Prerequisite(s): ATOE-1650 Graders and Plans, or ATOE-1700 Paving, Tractor, Backhoe Operations; or departmental approval.*

## ATOE-2650 Safety Training Passport 1 Credit

Introduction to the Occupational Safety and Health Act (OSHA). Topics include employee responsibilities and rights, standards, and basic hazard training.

*Lecture: 1 hours*

*Prerequisite(s): ATOE-1100 Operating Engineering Concepts, or departmental approval.*

## ATOE-2660 Grader Safety 2 Credits

Application of safety operations of graders. Topics include reading warning signs and labels, avoiding general hazards, monitoring systems and cab features, operation techniques and towing.

*Lecture: 2 hours*

*Prerequisite(s): ATOE-1650 Graders and Plans, or ATOE-2640 Advanced Grader Practice or concurrent enrollment; or departmental approval.*

**ATOE-2670 Rough Terrain Forklift Operation**

**2 Credits**

In-depth focus on OSHA regulations regarding industrial trucks, specifically OSHA 1910.178. Also includes characteristics of forklifts, identification of components of a truck and their functions, safety operations and safety equipment used on forklifts.

*Lecture: 2 hours*

*Prerequisite(s): ATOE-1100 Operating Engineering Concepts, and ATOE-1650 Graders and Plans; or departmental approval.*

**ATOE-2680 Hazardous Material Handling and Field Safety**

**2 Credits**

Introduction to governmental laws and agencies involving worker's health and safety protection. In-depth study of hazardous waste and emergency response operations, including the formation of Occupational Safety and Health Administration (OSHA). Regulations pertaining to specific rights to Code of Federal Regulations - OSHA 29 CFR 1910.120 (The Access to Exposure and Medical Records Standard), and decontamination procedures. Includes advanced concepts in informational programs, heat and cold stress, normal cooling mechanisms, heat-related illnesses, identifying signs of heat and cold stress and their prevention, diesel exhaust risks, asphalt emissions, Respiratory Standard Act 1910.134 and respiratory protection.

*Lecture: 2 hours*

*Prerequisite(s): ATOE-1100 Operating Engineering Concepts, and ATOE-1650 Graders and Plans; or departmental approval.*