

Course Name	Pumps Part 1		
Credit Hours	3 Hours		
Course Description	This course introduces operators to pumping systems, hydraulics, basic pumping terminology, and pump curves. We will also look at a number of pump types, including end-suction centrifugal pumps, propeller pumps, turbine pumps, and rotary pumps. For each pump type, we'll discuss internal parts, construction, and operation. This course has no prerequisites.		
Course Objectives	After completing this course, the licensee should be able to:		
	 Describe dead-end and recirculating hot water distribution systems. List several special considerations involved in chemical pumping systems. Define the term viscosity and give examples of high-viscosity materials. Describe suction head and suction lift pumping conditions. Tell what three elements make up total dynamic head. Define static suction head. Contrast liquid, brake, and electrical horsepower. Tell what information can be gained from pump curves. Describe the function of the following: pump casing, shaft, impeller, wear rings, and stuffing box. Contrast frame-mounted and close-coupled end- suction pumps. Give characteristics of fluids pumped with open, semiopen, and closed impellers. Name an advantage and a disadvantage each for stainless steel and brass shaft sleeves. Explain the construction of a lineshaft turbine pump. Name the two types of flow in a propeller pump. Tell the function of diffuser vanes in an axial-flow propeller pump. Define electrochemical corrosion and state its cause. Describe fluids that can be pumped by a regenerative turbine pump. 		

	 Describe the fluids that can be pumped by a rotary pump. Explain the operation of external- and internal-gear pumps. Describe the parts and construction of a lobe pump. Compare/contrast timed- and untimed-screw pumps. Tell why sealed bearings might be used in a vane pump. 			
Course Timed Syllabus	Attached			
Method of Presentation	This online course uses instructor-led video, animation, text, and images. Multiple choice questions are used to test how well the student understands the material between each section. Each answer choice has a response which tells the student whether the selected answer is correct or not.			
Schedule and Location	This course may be taken at any time at www.aypotech.com. The student may sign in and out of the course as many times as needed to complete the course.			
Attendance Verification	Licensees can only access the training course using a secure username and password, linked to their unique email address.			
Method of Evaluation	The licensee must complete all multiple-choice questions between sections correctly to get credit for the course. If their first response is incorrect, students will have to try again until they choose the correct answer. Question choices are randomized, so each participant will have a unique testing experience.			
	The course is also timed; participants will not get credit until they spend at least 180 active minutes in the course.			
	After successful completion of the course, the licensee is required to complete and submit a questionnaire in order to access their certificate of completion.			
Instructor(s)	Ralph Stevens			
Cost	\$30			

Section	Торіс	Questions	Word Count	Minutes
	Pump Development and Application			
1	The Development of Pumps	1	504	5.2
2	Pumping Systems	1	116	2.0
3	Water Pumping Systems	3	576	7.8
4	Chemical Pumping Systems	3	510	7.3
5	Waste Pumping Systems	1	534	5.5
6	High-Viscosity Material Pumping Systems	4	472	7.9
7	Solids Pumping Systems	1	292	3.4
	Basic Pump Hydraulics			
8	Pumping Terminology	3	836	10.0
9	Calculating Total Head	1	407	4.4
10	Horsepower Calculations	2	452	5.8
11	Total Energy vs Available NPSH	1	355	4.0
12	Available NPSH vs Required NPSH	1	174	2.5
13	Pump Performance Curves	1	200	2.7
14	Head Capacity Curves	1	503	5.2
15	Curve Families	1	494	5.1
16	Pump Selection	1	255	3.1
	End-Suction Centrifugal Pumps			
17	Centrifugal Pumps	1	657	6.5
18	Pump Parts	3	636	8.3
19	End-Suction Casing Configurations	2	252	4.1
20	Split-Case Centrifugal Pumps	1	410	4.4
21	Double-Volute Pumps	1	176	2.5
22	Impeller Types	2	517	6.3
23	Wearing Rings	1	231	2.9
24	Shafts, Bearings, and Sleeves	2	304	4.5
Propeller and Turbine Pumps				
25	Turbine Pumps Overview and Lineshaft Turbines	2	743	8.2
26	Can Turbines	1	114	2.0
27	Submersible Turbines	1	137	2.1
28	Flow Patterns	1	182	2.5
29	Axial-Flow Propeller Pumps	1	203	2.7
30	Mixed-Flow Propeller Pumps	1	276	3.3
31	Special Propeller Pumps and Turbine Pump Construction	1	637	6.3
32	Vertical Turbine Pump Application	1	158	2.3
33	Regenerative Turbine Pumps	2	492	6.1
	Rotary Pumps			
34	Introduction to Rotary Pumps	1	262	3.2
35	External-Gear Pumps	2	599	7.0
36	Internal-Gear Pumps	2	341	4.8
37	Lobe Pumps	1	134	2.1
38	Screw Pumps	2	534	6.5
39	Vane Pumps	1	629	6.2
40	Rotary Piston Pumps	1	269	3.2
41	Flexible-Member Pumps	1	341	3.8
42	Rotary Pump Installations	1	210	2.8
Totals: 62			16124	196.4
Time Required to Complete Course:				180.0

Pumps Part 1 Timed Syllabus

Ralph Stevens

Certificates/Licenses

- Certified Maintenance Reliability Professional
- Grade 4 Electrical/Instrumentation & Grade 3 Water Treatment Operator Licenses (CA)
- Grade 3 Operator, Maintenance Technician, & Grade 1 Collection Operator Licenses (AZ)

Instructional Experience

TPC Training/JADE Learning/American Safety Council

Conducts training seminars, assessing the training needs and comprehension of the students, preparing training material and agenda, continually enhancing technical instructional delivery and presentation skills, adjusting course content in accordance with business needs and regulatory requirements, and ensuring the quality of the course content throughout a course life cycle. Over 600 hours of classroom instructional experience per year.

California Water Environment Association

Class trainer for Electrical/Instrumentation licensees. Workshop trainer for Reliability Centered Maintenance.

Technical Experience

Maintenance Reliability Supervisor (CCWRD)

Helping leadership enhance the district into RCM, RCD, and Operational Excellence.

Planner/Scheduler (Clark County Water)

Planned, scheduled, inspected work performed along with mentoring staff at the WWTP, lift stations and lagoons. Instructed staff on the install, repair, and maintenance of motors, pumps, SCADA, controls, plant facilities and project management. Used Maximo EMS to monitor and control work flow, budgets, assets, and cost roll up. Served as onsite safety trainer, odor compliant person, and site inspector. Performed root cause analysis and predictive maintenance on plant equipment.

Electrical Supervisor (Metropolitan Water Reclamation)

Supervised Electrical Department in all wastewater processes, SCADA control wave, lift stations, deep tunnel, power plant sub-stations, control structures, disinfection, ozone, pumps, tide gates, and day-to-day operations. Supervised 4 WWTP operators, 24 electricians, support trades and contract workers. Setup the Mainsaver CMMS system, asset management, job and safety plans, and RCM implementation. Used CMMA and SAP to track progress, order parts, schedule work, and oversee work order completion. Worked on general construction from the sub-contractor side of the Deep Tunnel Storm Water Collection Systems.

2012 - 2014

1978 - 2012

2017 - present

2017 - 2020