TOTAL PUMP

3-DAY TRAINING COURSE

- **Are you confused by the variety of pump types?**
- **Do you know how to properly size pumps?**
- **Do you understand what causes cavitation in pumps, & how it can be avoided?**
- **Learn to deal with systems involving multiple pumps, variable speed, or viscous liquids?**

Phone: 1.800.786.8545 www.FluidFundamentals.com Fax: 360.412.0672

Proper pump selection can reduce maintenance AND energy costs!

www.FluidFundamentals.com

Fluid Fundamentals Training
4529 Intelco Loop SE
Lacey, WA 98503

Attendee Information

Name *Title*

Company

Address

City/State/Zip

Phone *Fax*

Email

Billing Contact Info If Different

Name *Title*

Company

Address

City/State/Zip

Phone *Fax*

Email

Payment Method

○ Visa ○ AMEX ○ MasterCard

Card Number

Expiration Date

Name on Card

Signature

○ Bill PO No._____

○ Check Enclosed

Indicate Class Date & Location

Class Date *Class Location*

Our classes are scheduled for the dates and times above, please select one. If you find that these dates or locations do not work for you please contact our Training Consultants as we will take your suggestions for future locations as well as discuss On-site Training possibilities.

Course Overview

Our Total Pump Training course is an in depth look at common pump applications, including selection, operation, troubleshooting, and maintenance. Individuals in the pump and piping system industries will find this to be a valuable course for learning the importance of proper pump operation and typical behavior in application.

This course is taught by a recognized industry expert, who can answer any questions about how system changes can alter pump operation and the best way to respond to system modifications. This is the most comprehensive pump training available in a short course!

Our Total Pump Training is designed to provide you with practical knowledge and skills needed to address common concerns involving pumps. This training will give you the ability to take what you've learned and apply it immediately back into your workplace.

Who Should Attend?

Total Pump Training is designed for a wide variety of industries, skill levels, and job titles. Unsure if you will fit in or benefit from this class? Don't worry, if you work with pumps, you will.

Attendees come from a variety of fields and skill levels including but not limited to:

- Design Engineers
- Plan or Facility Managers
- Maintenance Technicians
- Mechanics
- Building Owners
- Plant Operators
- Safety Engineers
- Recent College Graduates
- Pump Sales Representatives
- Anyone who needs centrifugal pump knowledge.

Materials Included

Pump Characteristics & Applications: This critically acclaimed, hands-on reference offers a practical introduction to pumps and provides the tools necessary to select, size, operate, and maintain pumps properly. It highlights the interrelatedness of pump engineering from system and piping design to installation and startup.

Comprehensive Course Workbook:
To maximize the value of your learning experience during and after the training course, your extensive course manual has been designed with many useful guidelines and key points of information covered in the course.

You'll find this manual to be an excellent resource for retrieving concepts taught during the seminar and applying them back on the job.

2.0 Continuing Education Credits:
2.0 Continuing Educational Units (CEU) or 20 Professional Development Hours will be awarded to course participants.

Course Certificate:
At the conclusion of the training course, you will be awarded an attractive Certificate of Completion with course content description included for confirmation of your continued education credits.

Course Outline

Introduction to Pumps
- Basic Definitions of Pumps Pressure & Head
- Classification of Pumps

Positive Displacement Pumps
- Intro to Positive Displacement (P.D.) Pumps
- Selection Criteria for P.D. Pump

Hydraulics, Selection & Curves
- Pump Capacity
- Head – Explanation of Elements
  Performance Curves – Read & Understand
- Horsepower & Efficiency
- How to Size Motors
- NPSH & Cavitation

Advanced Hydraulic Considerations
- Specific Speed & Suction Specific Speed
- Affinity Laws
- System Head Curves
- Parallel & Series Operation
- Performance Optimization
- Over-Sizing Pumps
- Pumping Viscous Liquids
- Piping Layout
- Field Testing Pumps

Energy Conservation in Pump Selection
- Selecting Pumps to Minimize Energy
- Life Cycle Pump Costs

Sealing Systems
- Stuffing Box/Packing Assembly
- Mechanical Seals
- Seal-less Pumps – Magnetic Drive & Canned
- Motor

Other Topics
- Impellers
- Wear Rings
- Thrust & Thrust Balance
- Pump Configuration Types
- ANSI & API Pump Standards
- Minimum Flow
- Suction Recirculation
- Pump Installation & Startup
- Maintenance
- Trouble Shooting
- Root Cause Failure Analysis
- Pump Repair

Why Should I Attend?

Here are 4 reasons why you'll want to attend the Piping System Fundamentals Training.

1. Learn to Identify Pump & System Problems - Attendees will learn to identify the real problems causing pump failures, instability, excessive power consumption and how to avoid these problems, increasing efficiency.

2. Locate areas where you can save your company money— Gain an understanding of how to minimize operating and maintenance cost by avoiding unplanned equipment failures.

3. Earn up to 20 Professional Development Hours— Earn continuing education units to apply toward licensure renewal or just brush-up on your piping system operational knowledge and principles.

4. Combine theoretical knowledge and practical experience to gain a total picture of pump operation.

5. Gain the confidence to carry out root cause failure analyses on pumps thus avoiding repetitive failures instead of just changing the parts.

About the Instructor

Course instructor, Michael Volk, P.E., has been a consultant on pumps for the past 30 years, after working in engineering and operations with one of the world's leading pump manufacturers. He authored *Pump Characteristics and Applications*, a highly acclaimed pump applications book now in its second edition.

Volk has taught hundreds of pump courses worldwide, including the most successful course ever held at the prestigious International Pump Users Symposium in each of the past ten years.

On-Site Training

We offer flexible onsite training opportunities where ever and whenever you need it. Our on-site training features curriculum designed to build core competencies, develop essential skill sets, promote best practices, and get measurable, sustainable results. We can even customize the courses for your specific facility.

All our training courses can be conducted on your site for up to 25 attendees, saving you time away from the office. Our expert instructors deliver onsite training to you and your plant staff. To schedule an onsite training course for your company, please call (360) 412-0702 or Toll Free (800) 786-8545. You may also email us at sales@fluidfundamentals.com.

Cancellation Policy

You may cancel your registration up to 30 business days before the seminar. Your registration fee will be refunded less a cancellation fee. If you need to cancel less than 30 business days prior to the seminar, you may (1) send a substitute from your organization or (2) transfer your registration fee within 12 months to another seminar or conference of your choice. Please note that if you do not cancel and do not attend, you are still responsible for payment. Substitutions may be made at any time.

Registration Rates

Early Registration, Single Seat: $1295
Day of Class, Single Seat: $1395

Group Discount:
Based on Number of attendees*

Onsite Training:
Call For Details (800) 786-8545

* Group Discount Only available via mail, phone or fax. All registrants must register at the same time to received group discount. Group discounts cannot be combined with any other discount and/or offer.

Ways to Register:

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