



## Course Description for Basic Centrifugal Pump Hydraulics

### Who is this course for?

This course is meant for operators in water and wastewater operations, who need Continuous Education Units towards their certification with the state and want to add useful & practical information to their professional knowledge base.

### What is the Course Structure?

1. The course is divided into a number of chapters- see chapter details on the next page.
2. Animations and simulations are provided to augment learning – this allows the student to interact with the learning materials and get a feeling for the dynamism of technical or scientific concepts.

### What is the course availability?

This is a totally web-based online course – no physical classroom attendance is required. Prospective students may enroll at any time, from anywhere, and start the course at any time, from anywhere.

### How do I Register?

Go back to the page where you opened this document and pick one of these easy options:

**ENROLL  
NOW**

Enroll online!

**OR**

**EMAIL US**

Get more info or  
ask us to enroll you!

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Centrifugal pumps are a key part of water and wastewater plants. In this course, we will discuss various concepts about the operation of these pumps and the science behind it. Topics that will be discussed include Pressure & Energy in terms of head; common pumping configurations, such as simple static suction lift; dynamic behavior of pumps during suction & discharge; typical performance curves & how to read them.

## Chapters & Learning Outcomes in this Course

### Pressure In Terms of Head, for Pumping Applications

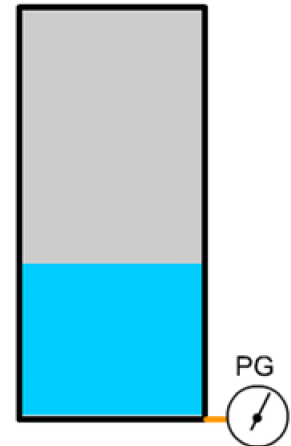
Standard Time to Complete: 10 mins

#### Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** how pressure can be considered in terms of "head" for pumping applications.
2. **CALCULATE** the pressure created based on the static level of water and vice versa.

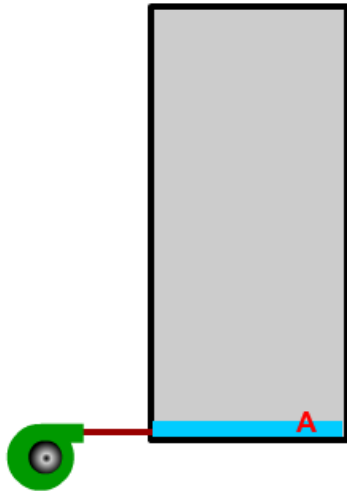
You will also use our interactive simulations to learn the concepts described above in detail. You will also do visual experiments, via our interactive slides, to learn the relationship between "head" and pressure.



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## Energy In Terms of Head, for Pumping Applications

Standard Time to Complete: 10 mins

### Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** how “head” can be used to express energy content, for pumping applications.
2. **DESCRIBE** the relationship between pressure and potential energy.

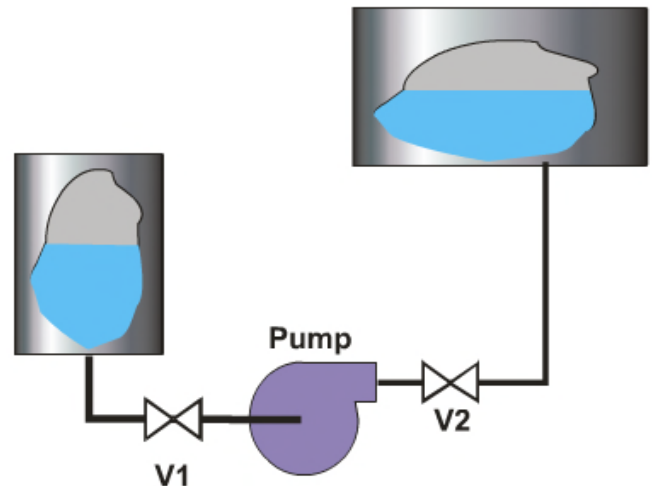
## Common Pumping Configurations

Standard Time to Complete: 20 mins

### Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** the simple static suction head pump configuration.
2. **DESCRIBE** what is meant by the terms “static suction head” and “static discharge head” for the static suction head pump configuration.
3. **DESCRIBE** the simple static suction lift pump configuration.
4. **DESCRIBE** what is meant by the terms “static suction lift” and “static discharge head” for the static suction lift pump configuration.



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## Dynamic Behavior of Pumps

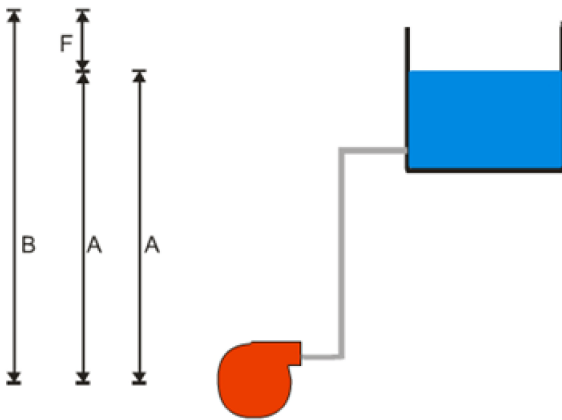
Standard Time to Complete: 90 mins

### Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** how a centrifugal pump transfers energy to water.
2. **DESCRIBE** the role of atmospheric pressure in centrifugal pump operations.
3. **DESCRIBE** the following concepts for both the suction and discharge of pumps: vapor pressure; friction loss; static lift; velocity head loss; Net Positive Suction Head.
4. **DESCRIBE** the difference between available vs required Net Positive Suction Head.

You will also use our interactive simulations to do experiments and learn the concepts described above in detail.



## Pump Performance Curves

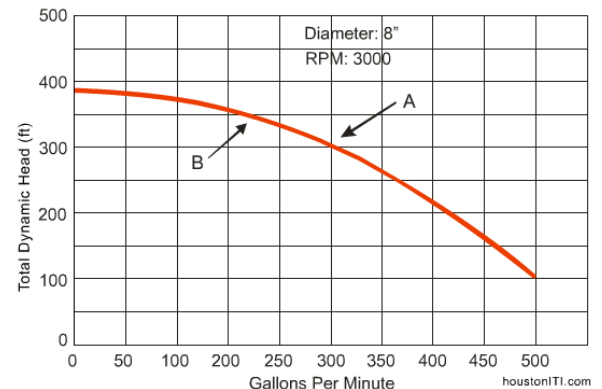
Standard Time to Complete: 70 mins

### Learning Outcomes

On successful completion of this learning module, you will be able to:

1. **DESCRIBE** the factors that influence the behavior of a pump in an industrial installation.
2. **DESCRIBE** what a Head-Capacity Pump Curve is and how it may be utilized.
3. **DESCRIBE** what a Pump Efficiency Curve is and how it may be utilized.
4. **DESCRIBE** what a Horsepower Curve is and how it may be utilized.

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## Course Quiz

Standard Time to Complete: 40 mins

Student will complete a multiple choice quiz. Pass mark is 75% or higher.

## Questions?

Email [Registrar@HoustonIndustrialTraining.com](mailto:Registrar@HoustonIndustrialTraining.com) or click the **Contact Us** button located in the header menu.

## Course Accreditation



Houston Industrial Training Institute has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102. In obtaining this approval, HITI has demonstrated that it complies with the ANSI/IACET 1-2007 Standard which is widely recognized as the Standard of good practice internationally. As a result of their Authorized Provider membership status, HITI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET 1-2007 Standard."

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