Credit Information

Practical Fluid Mechanics

This webinar offers 6.0 PDHs to professional engineers and 6.0 HSW continuing education hours to architects licensed in all states.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida (Provider No. 0004647), Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700) and North Carolina (S-0130). HalfMoon Education is deemed an approved continuing education sponsor for New York engineers and architects via its registration with the American Institute of Architects Continuing Education System (Regulations of the Commissioner §68.14(i)(2) and §69.6(i)(2)). Other states do not preapprove continuing education providers or courses.

The American Institute of Architects Continuing Education System has approved this course for 6.0 LU|HSW (Sponsor No. J885). Only full participation is reportable to the AIA/CES.

The International Code Council has approved this event for .6 CEUs in the specialty area of Building (Preferred Provider No. 1232).

Completion certificates will be awarded to participants who complete this event, respond to prompts and earn a passing score (80%) on the quiz that follows the presentation (multiple attempts allowed).

Pumping and Piping Systems

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Live, Interactive Webinars
- Practical Fluid Mechanics
- Pumping and Piping Systems

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Live, Interactive Webinars

Practical Fluid Mechanics
- Tuesday, February 8, 2022 | 8:30 am - 3:30 pm CST

Pumping and Piping Systems
- Thursday, February 10, 2022 | 11:00 am - 2:15 pm CST
- Friday, February 11, 2022 | 11:00 am - 2:15 pm CST

To register, view detailed presenter biographies, and see other learning opportunities, please visit:
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Practical Fluid Mechanics

Tuesday, February 8, 2022 | 8:30 am - 3:30 pm CST (incl. a 30-min break)

Tuition: $289 per registrant, $239 per registrant for three or more

Credits: Professional Engineers: 6.0 PDHs Architects: 6.0 HSW CE Hours
AIA: 6.0 LU|HSW International Code Council: .6 CEUs (Building)

Agenda

Exploring Applications of Fluid Mechanics

- Flow measurement
- Meteorology
- Medical
- Automotive
- Marine applications
- Other applications
- Aircraft
- Pipelines
- Rivers and streams
- Submerged surfaces
- Pumps and compressors

Fluid Mechanics – Basics and Definitions

- Definition of a fluid
- Fluid properties
- Dimensions and units

Fluid Statics – Theory

- Hydrostatic pressure
- Archimedes principle
- Forces on submerged surfaces

Fluid Statics – Applications

- Hydrostatic pressure
- Forces on curved surfaces
- Forces on flat inclined surfaces
- Archimedes principle

Fluid Dynamics – Theory

- Continuum assumption
- Viscosity and shear stress
- Newtonian versus non-Newtonian fluids

Examples and Equations

- Shear stress examples
- Journal bearing example
- Velocity vectors and streamlines
- Volumetric flowrate versus velocity
- Conservation of mass
- Bernoulli effect
- Siphon example
- Venturi meter example
- Pipe flow
- Work-energy equation
- Gravity flow example
- Pump power example
- Viscometer example
- Closed system versus control volume
- Bernoulli's equation
- Water pipeline example
- Sluice gate example
- Laminar versus turbulent flow
- Major and minor loss
- Pressure drop in a pipeline example
- Turbine power example

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Agenda Day One

Introduction to Pumps: Operations, Principles and Calculations

Operation of centrifugal pumps
- Intro, terms, definitions
- Centrifugal pump construction, components, impeller, motor, volute
- Incompressible fluid, pumping equations
- Closed system, open system, parallel and series pumping applications

Reviewing hydraulic principles and calculations
- Fixture units and GPM
- Friction losses/allowable pressure drop
- Static pressure vs. dynamic pressure
- Equivalent lengths

Design Standards and Codes

IPC – International Plumbing Code – state amendments NFPA
UFC – Unified Facilities Criteria (military requirements)
WBDG – Whole Building Design Guide
AHJ – Authority Having Jurisdiction
The interpreter of the Code, Plumbing Inspector, Fire Marshall
LEED – Leadership in Energy & Environmental Design
USGBC

Agenda Day Two

Piping System Components, Materials and Calculations

Piping System Components and Materials
- Copper vs. plastics, galvanized steel and stainless steel
  - When, where, why
- BFP, PRV, meters
- Valves, ball valves, gate valves, butterfly valves, flow-balancing valves

Making Basic System Calculations
- Pipe sizing
- Pump sizing
- Friction loss calculation

Handling Pump and Piping System Problems

Booster pumps
Circulating pumps, chilled water, hydronic heating, domestic hot water
Fire pumps

22 USPMPPS1 2 10 WEBR AM - 22 USPMPPS2 2 11 WEBR AM

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Faculty

Practical Fluid Mechanics

Gregory H. Nail, PhD, PE *Associate Professor, University of Tennessee at Martin*

Dr. Nail is an associate professor in the Engineering Department at the University of Tennessee at Martin where he teaches a variety of courses including fluid mechanics, hydraulics and hydrology, and hydraulic and hydrologic modeling. He holds a professional engineer's license based on having passed both the Civil and Mechanical discipline-specific exams. Prior to coming to UT-Martin in 2002 he worked as a research hydraulic engineer for the United States Army Corp of Engineers for 11 years. He is a former member of the Executive Committee of the Tennessee American Water Resources Association, and he has lectured on various HEC-RAS modeling topics at the Annual Tennessee Water Resources Symposium and at other venues. Dr. Nail earned his B.M.E. degree from Auburn University and his M.S. and Ph.D. degrees from Texas A&M University.

Pumping and Piping Systems

George Walters III, PE, CPD *Mechanical Engineer at BMH Engineering LLC*

Mr. Walters is a professional engineer and is certified in plumbing design through the American Society of Plumbing Engineers. His responsibilities overlap into the professional engineering areas of civil engineering, mechanical engineering, chemical engineering, fire protection engineering, and process engineering. He performs calculations, sizes equipment, and prepares plumbing design and construction documents. Mr. Walters is a member of the Atlanta Chapter of the American Society of Plumbing Engineers (ASPE). He earned his B.S. degree in Mechanical Engineering from Georgia Tech.

Additional Learning

Designing for Accessibility under ADA Standards and 2021 IBC
- Tues, Jan 11, 2022|8:30 am - 4:30 pm CST

Technical Writing Workshop for Design Professionals
- Wed, Jan 12, 2022|8:30 am - 5:00 pm CST

IRC Significant Changes – Chapters 1-10
- Thurs, Jan 13, 2022|11:00 am - 3:30 pm CST

Focus on New Developments in Solar PV Technology
- Fri, Jan 14, 2022|1:00 - 3:00 pm CST

Handling Ethical Issues in Construction
- Tues, Jan 18, 2022|3:00 - 5:00 pm CST

How to Design Accessible Parking
- Wed, Jan 19, 2022|11:00 am - 1:00 pm CST

Timber Frame Design and Construction
- Wed, Jan 19, 2022|9:00 am - 4:30 pm CST

Construction Cost Estimating
- Thurs, Jan 20, 2022|8:30 am 4:30 pm CST

IRC Significant Changes – Chapters 11-44
- Thurs, Jan 20, 2022|11:00 am - 3:30 pm CST

Erosion and Sediment Control
- Tues, Jan 25, 2022|8:30 am - 5:00 pm CST

A Drainage Technology Update
- Tues, Jan 25, 2022|10:00 am - 12:00 pm CST

Air-Source Heat Pumps, Mini-Splits, and Heat Pump Water Heaters
- Wed, Jan 26, 2022|12:00 - 3:30 pm CST
- Thurs, Jan 27, 2022|12:00 - 3:30 pm CSTT

Seismic Design and Construction
- Thurs, Jan 27, 2022|8:30 am - 5:00 pm CST

Stormwater Best Management Practices
- Thurs, Jan 27, 2022|8:30 am - 5:00 pm CST

Cogeneration System Principles and Practices
- Mon, Jan 31, 2022|8:30 am - 4:30 pm CST

Introduction to HEC-HMS Modeling
- Mon, Jan 31, 2022|8:30 am - 5:00 pm CST

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