

Agenda

Presented by Gregory H. Nail, PhD, PE

Introductions and Exploring Open Channel Hydraulics

Introduction and overview Exploring open channel hydraulics

Steady One-Dimensional Open Channel Hydraulics Background and Theory

Conservation of energy: steady one-dimensional
Conservation of momentum Conservation of energy: energy losses
Conservation of energy: computational enhancements
Bernoulli's equation Computer-based analysis and computations

HEC-RAS and Water Surface Profiling

Required data and boundary conditions
Backwater and forewater calculations
Bridge and culvert modeling

History and Development of HEC-RAS

Demonstration 1 – Building a HEC-RAS Model Without GIS

HEC-RAS user interface Building a hydraulic model without geo-referenced data
Steady flow computational simulation
Viewing of results Trapezoidal channel example

Demonstration 2 - GIS Basics

Introduction and overview Geographic versus projected coordinate systems
Raster versus vector files ArcMap versus ArcCatalog
ArcMap interface basics Digital elevation model
Other files

Demonstration 3 – Building a HEC-RAS Model with GIS

RASMapper interface and the projection file
Digital elevation models and geometry creation
Building a hydraulic model with geo-referenced data
Steady flow computational simulation
Display and interpretation of results

Demonstration 4 – Typical HEC-RAS River Reach and Mixed Flow

Subcritical flow Mixed flow

Demonstration 5 – Typical HEC-RAS Bridge Model

Cross section locations Expansion and contraction coefficients
Implementing the bridge Steady flow simulation
Viewing and interpreting results

Demonstration 6 – Typical HEC-RAS Culvert Model

Cross section locations Implementing the culvert
Steady flow simulation Viewing and interpreting results

Demonstration 7 – Typical HEC-RAS Encroachment Model

Encroachment methods Steady flow simulation
Viewing and interpreting results

Introduction to HEC-RAS Modeling
Roanoke, VA - Thursday, March 26, 2020

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Learning Objectives

You'll be able to:

Discuss the principles of open channel hydraulics, including conservation of momentum, conservation of energy and Bernoulli's Equation.

Discuss the history and development of HEC-RAS and get tips on building models with and without GIS.

Learn about modeling bridges in HEC-RAS, using expansion and contraction coefficients and steady flow simulation.

Create a typical HEC-RAS culvert model using steady flow simulation.

Create a typical HEC-RAS encroachment model, and be able to view and interpret the results.



Introduction to HEC-RAS Modeling

Roanoke, VA - Thursday, March 26, 2020



Explore open channel hydraulics background and theory

Understand the history and development of HEC-RAS

Learn about building a HEC-RAS model with and without GIS

Discuss typical HEC-RAS river reach and mixed flow

Learn about typical HEC-RAS bridge, culvert, and encroachment models

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Floodplain Managers
7.0 ASFPM CECS

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Faculty

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.

Here's what past attendees had to say about the program and presenter Gregory Nail:

"Good seminar." – *Architect*

"Very knowledgeable speaker." – *Landscape Architect*

"Great presenter." – *Civil Engineer*

Seminar Information

Hyatt Place Roanoke Airport/ Valley View Mall

5040 Valley View Blvd. North
Roanoke, VA 24012
(540) 366-4700

Registration	Lunch (On your own)
8:00 - 8:30 am	12:00 - 1:00 pm
Morning Session	Afternoon Session
8:30 am - 12:00 pm	1:00 - 5:00 pm

Tuition

\$299 for individual registration

\$279 for three or more simultaneous registrations.

Included with your registration:

Complimentary continental breakfast and printed seminar manual.

Receive a reduced tuition rate of \$101 by registering to be our on-site coordinator for the day. For availability and job description, please visit www.halfmoonseminars.org.

How to Register

- Visit us online at www.halfmoonseminars.org
- Mail-in or fax the attached form to 715-835-6066
- Call customer service at 715-835-5900

Cancellations: Cancel at least 48 hours before the start of the seminar, and receive a full tuition refund, minus a \$39 service charge for each registrant. Cancellations within 48 hours will receive a credit toward another seminar. You may also send another person to take your place.

Additional Learning

Webinar Series

Foundations in Cold Regions

- **Introduction to Foundations in Cold Regions**
Thurs., Feb. 20, 2020, 11:00 AM - 12:30 PM CST

- **Shallow Foundation Design in Cold Regions**
Thurs., Feb. 20, 2020, 1:00 - 2:30 PM CST

- **Deep Foundation Design in Cold Regions**
Fri., Feb. 21, 2020, 11:00 AM - 12:30 PM CST

- **Foundation Construction in Cold Regions**
Fri., Feb. 21, 2020, 1:00 - 2:00 PM CST

Soil Mechanics and Slope Stability

- **Soil Investigation and Classification**
Tues., Feb. 25, 2020, 11:00 AM - 1:00 PM CST

- **Reviewing Hydraulic and Mechanical Properties of Soils**
Tues., Feb. 25, 2020, 1:30 - 3:00 PM CST

- **Determining and Increasing Bearing Capacity**
Wed., Feb. 26, 2020, 11:00 AM - 1:00 PM CST

- **Determining and Increasing Slope Stability**
Wed., Feb. 26, 2020, 1:30 - 3:00 PM CST

Designing for Climate Resilience

- **Current and Anticipated Climate Effects on Structures and Communities**
Thurs., Feb. 27, 2020, 11:00 AM - 12:30 PM CST

- **Assessing the Impact of Sea Level Rise, Changing Temperature and Changing Weather Patterns**
Thurs., Feb. 27, 2020, 1:00 - 3:00 PM CST

- **Studying the Impact of Extreme Weather Events on Structures and Communities**
Fri., Feb. 28, 2020, 11:00 AM - 12:30 PM CST

- **Adapting Sites, Outdoor Spaces, New Construction and Existing Buildings to Withstand Extreme Weather Events**
Fri., Feb. 28, 2020, 1:00 - 3:00 PM CST

For more information and other online learning opportunities visit: www.halfmoonseminars.org/webinars/

Continuing Education Credit Information

This seminar is open to the public and offers 7.0 continuing education hours to engineers and landscape architects (HSW) and 7.0 HSW CE hours to architects in most states, including Virginia. Educators and courses are not subject to preapproval in Virginia.

This event has been approved by the American Institute of Architects Continuing Education System for 7.0 LU|HSW (Sponsor No. J885) and by the Landscape Architecture Continuing Education System for 7.0 HSW PDHs. Visit www.halfmoonseminars.org for complete AIA/CES information under this course listing. Only full attendance is reportable to AIA/CES and LA/CES.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida, Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700), North Carolina, and North Dakota. HalfMoon Education is deemed an approved continuing education sponsor for New York engineers, architects and landscape architects.

The Association of State Floodplain Managers has approved this event for 7.0 CECs.

This course offers a non-credit continuing education opportunity to contraction contractors. It has not been preapproved in any state with contractor continuing education requirements.

Attendance will be monitored, and attendance certificates will be available after the seminar for most individuals who complete the entire program. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

Registration

Introduction to HEC-RAS Modeling

Roanoke, VA - Thursday, March 26, 2020

How to Register

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Complete the entire form. Attach duplicates if necessary.

Registrant Information

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Tuition

() **I will be attending the live seminar.** Single Registrant - **\$299.00**. Three or more registrants from the same company registering at the same time - **\$279.00** each.

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