

# Agenda

Presented by Gregory H. Nail, PhD, PE

## Applications of Open Channel Hydraulics

- River and watercourse analysis
- Floodplain management
- Flood hazard mapping and risk analysis
- Channel and levee design
- Roadway crossing and bridge analysis and design
- Bridge scour analysis

## Principles of Hydraulic Analysis

- Conservation of energy
- Conservation of momentum
- Bernoulli equation
- Energy losses
- Backwater and forewater calculations
- Computer-based analysis and computations

## History and Development of US Army Corps of Engineers HEC-RAS Application

## HEC-RAS Application User Interface

- Program file and project management
- Data entry and editing
- GIS data usage
- Results and reporting
- Mapping capabilities

## Water Surface Profiling

- Flow types
- Analysis data required for modeling
- Cross section location
- Discharge flows and boundary conditions
- Step backwater calculations
- Model calibration

## Bridge and Culvert Modeling

- Cross section locations
- Flow regimes
- Ineffective flow areas
- Bridge model setup

## Steady Flow Surface Profile Demonstration 1

- Live demo for typical river reach
- Project file setup
- Geometry file demo
- Steady flow file demo
- Setting boundary conditions
- Simple river reach modeling tips

## Steady Flow Surface Profile Demonstration 2

- Live demo for simple bridge
- Setup of typical bridge cross section model
- Establishment of ineffective flow areas
- Simple bridge modeling tips

## Introduction to HEC-RAS Modeling

North Little Rock, AR - Tuesday, January 15, 2019



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Altoona, WI 54720-0278

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# Learning Objectives

## You'll be able to:

**Explore** the many applications of open channel hydraulics, including flood hazard mapping, roadway crossing analysis and bridge design.

**Review** principles of hydraulic analysis, and explore backwater and forewater calculations.

**Understand** the history and development of HEC-RAS, and learn how to work with the HEC-RAS user interface.

**Learn** about bridge and culvert modeling.

**Discuss** key issues in steady flow water surface profiling.



# Introduction to HEC-RAS Modeling

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**Understand** the applications of open channel hydraulics, including flood hazard mapping and channel, levee and bridge design

**Identify** the principles of hydraulic analysis

**Review** the history and

development of US Army Corps HEC-RAS application

**Examine** the HEC-RAS user interface

**Learn** about types of flow and the data required for modeling

**Explore** steady flow surface

## Continuing Education Credits

### Professional Engineers

6.5 PDHs

### Floodplain Managers

6.5 ASFPM CECS

### Geologists

6.5 PDHs



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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

## Courtyard Little Rock North

4339 Warden Road  
North Little Rock, AR 72116  
(501) 753-2000

Registration 8:00 - 8:30 am	Lunch (On your own) 12:00 - 1:00 pm
Morning Session 8:30 am - 12:00 pm	Afternoon Session 1:00 - 4:30 pm

## Tuition

**\$279** for individual registration

**\$259** for three or more simultaneous registrations.

*Each registration includes a 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 a job description, go online to [www.halfmoonseminars.org](http://www.halfmoonseminars.org).

## How to Register

- Visit us online at [www.halfmoonseminars.org](http://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

### Residential Energy Code

- **Introduction to the Residential Energy Code and Mandatory Requirements**  
Thurs., Dec. 6, 2018, 11:00 AM - 12:30 PM CST
- **IECC Residential Building Envelope Requirements**  
Thurs., Dec. 6, 2018, 1:00 - 2:30 PM CST
- **IECC Residential HVAC Requirements**  
Fri., Dec. 7, 2018, 11:00 AM - 12:30 PM CST
- **International Energy Conservation Permit Pathways**  
Fri., Dec. 7, 2018, 1:00 - 2:30 PM CST

### Deep Foundations

- **Deep Foundation Site Evaluation**  
Weds., Dec. 12, 2018, 11:00 AM - 12:00 PM CST
- **Overview of Deep Foundations**  
Weds., Dec.12, 2018, 12:30 - 2:00 PM CST
- **Deep Foundation Pile Design**  
Thurs., Dec. 13, 2018, 11:00 AM - 12:30 PM CST
- **Deep Foundation Installation and Testing**  
Thurs., Dec. 13, 2018, 1:00 - 2:00 PM CST

### Stormwater Management Systems

- **Stormwater Infrastructure Practices**  
Weds., Dec. 19, 2018, 11:00 AM - 1:00 PM CST
- **Infiltration Management Techniques**  
Thurs., Dec. 20, 2018, 11:00 AM - 1:00 PM CST

### NFPA 70E Series

- **NFPA 70E, Part I**  
Weds., Dec. 26, 2018, 11:00 AM - 3:30 PM CST
- **NFPA 70E, Part II**  
Thurs., Dec. 27, 2018, 11:00 AM - 3:30 PM CST

### Seismic Design and Construction

- **Seismology and Building Codes**  
Thurs., Dec. 27, 2018, 11:00 AM - 3:30 PM CST
- **Seismic Design of Building Structures**  
Fri., Dec. 28, 2018, 11:00 AM - 3:30 PM CST

For more information and other online learning opportunities visit:  
[www.halfmoonseminars.org/webinars/](http://www.halfmoonseminars.org/webinars/)

## Continuing Education Credit Information

This course is open to the public and offers 6.5 PDHs to engineers in all states. Educators and courses are not subject to preapproval in Arkansas.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida, Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700), New York (NYSED Sponsor No. 35), North Carolina, and North Dakota.

The Association of State Floodplain Managers has approved this course for 6.5 CECs for certified floodplain managers.

Continuing education is not mandatory for geologist license maintenance in Arkansas. This course will qualify for geologist PDHs in other states.

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

**Attendees** wishing for hands-on HEC-RAS experience can do so by participating in the two live demonstrations during the afternoon session. This is entirely optional, but those wishing to do so should download and install HEC-RAS 5.0.3 on your laptop before arriving at the seminar (<http://www.hec.usace.army.mil/software/hec-ras/downloads.aspx>). All HEC-RAS files used by the presenter during the live demonstrations will be distributed to attendees on a DVD, prior to the start of the seminar. No internet connection or licensing is required to run HEC-RAS, once it is installed. Participation in the live HEC-RAS demonstrations is the choice of the attendees, and is not required.

# Registration

## Introduction to HEC-RAS Modeling

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How to Register	Registrant Information
<b>Online:</b> <a href="http://www.halfmoonseminars.org">www.halfmoonseminars.org</a>	Name: _____ Company/Firm: _____ Address: _____ City: _____ State: _____ Zip: _____ Occupation: _____ Email: _____ Phone: _____
<b>Phone:</b> 715-835-5900	<b>Additional Registrants:</b> Name: _____ Occupation: _____ Email: _____ Phone: _____
<b>Fax:</b> 715-835-6066	Name: _____ Occupation: _____ Email: _____ Phone: _____
<b>Mail:</b> HalfMoon Education Inc., PO Box 278, Altoona, WI 54720-0278	Name: _____ Occupation: _____ Email: _____ Phone: _____
<b>Complete the entire form.</b> Attach duplicates if necessary.	Email address is required for credit card receipt, program changes, and notification of upcoming seminars and products. Your email will not be sold or transferred.
( )  I need special accommodations. Please contact me.	

## Tuition

( ) **I will be attending the live seminar.** Single Registrant - **\$279.00**. Three or more registrants from the same company registering at the same time - **\$259.00** each.

**Checks:** Make payable to HalfMoon Education Inc.

**Credit Card:** *Mastercard, Visa, American Express, or Discover*

Credit Card Number: \_\_\_\_\_

Expiration Date: \_\_\_\_\_ CVV2 Code: \_\_\_\_\_

Cardholder Name: \_\_\_\_\_

Billing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Signature: \_\_\_\_\_

Email: \_\_\_\_\_