

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 – Introduction to 2D-Unsteady Flow Modeling

2D-unsteady flow versus 1D-steady flow
Geometry and computational mesh Boundary conditions
2D-unsteady flow simulation Viewing and interpreting results

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Introduction to HEC-RAS Modeling

Online - Tuesday, November 16, 2021

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Learning Objectives

You'll be able to:

Explore the history and development of HEC-RAS software.

Discuss steady one-dimensional open channel hydraulics.

Build a hydraulic model with and without geo-referenced data.

Discuss GIS basics, and learn about building a model with GIS.

Watch a demonstration of HEC-RAS river reach and mixed flow.

View and **interpret** results of typical HEC-RAS models for bridges and culverts.

HalfMoon Education Live Webinars

Introduction to HEC-RAS Modeling

Online - Tuesday, November 16, 2021



Understand steady one-dimensional open channel hydraulics

Explore HEC-RAS and water surface profiling

Review GIS basics

Discuss building HEC-RAS models with and without geo-referenced data

Explore typical HEC-RAS models, including river reach, bridges, culverts, and encroachment

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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.

Webinar Information

Log into Webinar 8:00 - 8:30 am CST	Break 12:00 - 1:00 pm CST
Morning Session 8:30 am - 12:00 pm CST	Afternoon Session 1:00 - 5:00 pm CST

Tuition

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

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Additional Webinars

Handling Ethical Issues Associated with Construction Defects and Failures
- Wed, Oct 27, 2021 | 9:00 - 10:00 am CDT

Internal Design of MSE Walls and Geosynthetics
- Wed, Oct 27, 2021 | 10:00 am - 1:15 pm CDT

Vegetated Green Roof Technology: Design and Construction
- Thurs, Oct 28, 2021 | 8:30 am - 4:00 pm CDT

Infrastructure: Structural Analysis and Sustainability
- Fri, Oct 29, 2021 | 1:30 - 6:00 pm CDT
- Fri, Nov 5, 2021 | 1:30 - 6:00 pm CDT

International Existing Building Code 2021
- Fri, Oct 29, 2021 | 7:30 am - 3:20 pm CDT

Shallow Foundation Design, Construction and Repair
- Mon, Nov 1, 2021 | 8:30 am - 5:00 pm CDT

Unreinforced Slope Stability Analysis
- Wed, Nov 3, 2021 | 10:00 am - 12:00 pm CDT

Drone-Based Inspection and Maintenance
- Fri, Nov 4, 2021 | 8:30 am - 4:30 pm CDT

Stormwater Best Management Practices
- Thurs, Nov 4, 2021 | 8:30 am - 5:00 pm CDT

How to Design a Reinforced Slope
- Wed, Nov 10, 2021 | 10:00 am - 12:00 pm CST

Best (and Worst) Practices for Retaining Wall Success and Interactive Workshop Wrap-Up
- Wed, Nov 17, 2021 | 10:00 am - 1:15 pm CST

Focusing on the Legal Ramifications of Drone Use for Utilities
- Fri, Nov 19, 2021 | 10:00 am - 12:00 pm CST

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Continuing Education Credit Information

This seminar/webinar offers 7.0 PDHs to professional engineers and 7.0 HSW PDHs/continuing education hours to architects and landscape architects in most states.

This course has been approved by the American Institute of Architects Continuing Education System for 7.0 LU | HSW (Sponsor No. J885). Halfmoon Education has applied to the Landscape Architecture Continuing Education System for course approval, which is pending. Visit this course listing at www.halfmoonseminars.org for updates on this credit. Only full participation is reportable to the AIA/CES and LA CES.

The Association of State Floodplain Managers has approved this course for 7.0 CECs for certified floodplain managers.

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

Registration

Introduction to HEC-RAS Modeling

Online - Tuesday, November 16, 2021

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