

HEC-RAS Unsteady Flow & Water Quality River Hydraulics Modeling – 8.0 Hours

Course Description

Summary

This training course begins with an introduction to using the unsteady flow component of HEC-RAS. Additional lectures present unsteady flow theory, steps for developing an unsteady flow simulation, and procedures for creating a stable and calibrated model. Guidance is given for techniques on modeling bridges, dams, spillways, and other storage areas in the unsteady flow environment. Introduction to river water quality analysis modeling is provided. Participants will build on the knowledge and experience acquired during the previous HEC-RAS course and/or during practical work experience.

The primary focus of this training course is to provide “hands-on” experience to the modeler. Participants will learn by doing, while using the HEC-RAS software on their own computers. The lectures and lab sessions will concentrate on demonstrating how to use the software in “real world” engineering applications.

Participants are required to bring their own laptop computer to the workshop, with Microsoft® Excel® installed.

Course Objectives

- Benefit from “hands-on” instruction throughout the course
- Understand why unsteady flow modeling is important
- Understand the differences between steady and unsteady flow theory and modeling techniques
- Develop confidence in application of HEC-RAS unsteady flow modeling
- Gain intensive, hands-on experience in model application
- Learn how to review analysis results and troubleshoot models
- Learn advanced modeling techniques
- Learn to recognize potential problems in a modeling situation
- Hear about “real life” applications

Course Topics

- Become familiar with the unsteady modeling capabilities in HEC-RAS including bridges, culverts, reservoirs, dams, spillways, storage areas, gates, and inline and lateral structures
- Perform unsteady flow analysis and complete hydrograph routing
- Analyze levee overflows and split flow conditions
- Account for tidal boundary conditions
- Perform dam failure analysis
- Develop stable unsteady flow models
- Perform river water quality analysis

Prerequisites

Some prior knowledge and experience with HEC-RAS is helpful, but not required.

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Learning Objectives

1. Participants will be able to perform unsteady flow analysis and complete hydrograph routing using HEC-RAS along with the sample projects used in the course.
2. Participants will be able to construct stable unsteady flow models using HEC-RAS along with the sample projects used in the course.
3. Participants will be able to perform dam failure analysis using the exercise provided in the course.
4. Participants will be introduced to river water quality analysis using HEC-RAS in the course.
5. Participants will gain confidence in applying unsteady flow HEC-RAS to a variety of modeling problems from the lectures and exercises provided in the course.
6. Participants will learn how to troubleshoot unsteady flow HEC-RAS models and how to review HEC-RAS models from the lectures and exercises provided in the course.

HEC-RAS UNSTEADY FLOW & WATER QUALITY RIVER HYDRAULICS MODELING – ONE DAY	
Overall Course Length	8.0 Hours
Instructional Time	7.0 HOURS
PROFESSIONAL DEVELOPMENT HOURS (PDHs)	
New York State Land Surveyors	N/A
New York State Professional Engineers	7.0 PDHs



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