

**SUNY-ESF STORMWATER MANAGEMENT PROGRAM 2008-2009
COURSE DESCRIPTIONS**

HYDRAULICS/SOILS-405

Knowledge of soils and hydraulics is an important component of the design and construction of stormwater management facilities. The first part of this course will review the methods for computing flows through pipes, channels, orifices and weirs.

Secondly, the classification of soils and their engineering characteristics will be examined (plasticity, sieve analysis, angle of repose, permeability coefficient, bearing capacity, optimum moisture content, etc.)

Finally, these principles and characteristics will be applied to practical design examples of stormwater facilities during the class exercise.

STORMWATER PRACTICES FOR RE-DEVELOPMENT AND RETROFITTING-403

As vacant land becomes more scarce, many new building projects are utilizing sites that have been previously developed. There are unique challenges and opportunities to designing stormwater management practices for re-development. Retrofitting existing drainage facilities to provide higher levels of treatment is necessary in many situations. This class will review the NYS Stormwater Re-development Standards and Practices, and teach participants how to apply the concepts to actual design and field examples. We will also examine ways to retrofit existing sites to reduce stormwater runoff and pollutant discharges.

STORMWATER AND THE DEVELOPMENT PROCESS/SEQR-409

From vision to certificate-of-occupancy, developing property is a complicated enterprise, with stormwater management playing an ever increasing role. This class will take a close look at the issues that influence private sector development, including natural, economic, political, sociological, regulatory, philosophical and even psychological factors. Stormwater management practices for a project must consider all of these while being practical, durable and sustainable. We will identify the steps, the issues, and the players involved in typical development projects, and learn how to successfully integrate stormwater management in the process.

An overview of the State Environmental Quality Review Act will also be provided.

NATURAL AND CREATED WETLANDS-401

Wetlands are an important natural resource, and an effective stormwater management practice. Participants will learn the characteristics and types of natural wetlands, state and national regulations, and receive hands-on field experience in delineating wetland boundaries. In addition we will examine essential design construction elements for creating and maintaining ecologically viable stormwater wetlands.

SITE PLANNING FOR LOW IMPACT DEVELOPMENT-408

The most effective way to reduce stormwater development impacts is during the planning process where measures can be incorporated into the overall site design. In this workshop participants will review the Better Site Design principles and the NYS-DEC Stormwater Credits, (which emphasize the three tenets of "green" planning: *preservation, minimization and management*.)

The class will participate in the design of actual development projects, where these planning principles are applied.

STORMWATER PONDS-413

Wet ponds have become the most widely used and accepted stormwater management practice and are used to remove pollutants from stormwater runoff, mitigate peak flow rates, while creating an aesthetically attractive site feature.

This course will cover the attributes of various pond designs, and review pond hydrology and hydraulics. Specific design examples will be utilized.

STORMWATER FILTERS & INFILTRATION PRACTICES-410

In this workshop you will learn how to: select the appropriate practice for the site; specify design procedures for infiltration trenches, bioretention, sand filters, dry and wet swales, etc.; use flow splitting to control practice performance and review latest market products.

FUNDAMENTALS OF EROSION & SEDIMENT CONTROL-402

One of the critical components of stormwater management on construction sites is a properly prepared erosion and sediment control plan. This course will cover: evaluating a site for water quality risk; identifying resources and plan components; computing soil loss and hydrologic impacts; selection and design of appropriate practices for site control and preparation of O&M plans.

STORMWATER MANAGEMENT PRACTICES FOR HEIGHTENED CRITERIA AREAS-411

According to the newly adopted Stormwater General Permits, any new development in impaired watersheds must provide higher levels of pollutant removals. Municipalities may also be called upon to retrofit existing development in impaired watersheds.

This class will review the heightened criteria design standards and permit coverage requirements for private developers and involved municipalities. We will also assess the current status of research and field results regarding sources of priority pollutants and their treatment methods. Specific design examples for new development and site retrofits will be given as well as an overview of available watershed pollutant assessment models.

SWPPP REVIEW FOR MS4s-412A

Many local municipalities in New York are now required to review and certify SWPPPs as part of the NYS GP-08-02 permit coverage. The class will cover the essential elements of a SWPPP, and examine the various stormwater management practices and design standards and their derivatives. The objective of this class is to provide those officials and consultants charged with this responsibility sufficient tools and knowledge to comfortably and consistently perform SWPPP reviews.

We will also provide guidelines for evaluating proposed design alternatives that deviate from the standards. The importance of maintaining opportunities for applicants to develop creative solutions to stormwater management while protecting the reviewing municipality's liability will be emphasized.

FUNDAMENTALS OF WATERSHED HYDROLOGY I-404A

Understanding the hydrology of stormwater is essential for anyone that is involved in designing, reviewing, constructing or regulating drainage. This course will cover the three (3) basic influences of climate, topography and land cover and review the standard methods and models (Rational, TR-55 and Hydrocad) for computing runoff rates and volumes. Actual design examples of stormwater conveyance facilities will be used.

FUNDAMENTALS OF WATERSHED HYDROLOGY II-404B

This course will build on the skills learned in Hydrology I to examine the methods of modeling and designing stormwater detention facilities in complex watersheds using the WIN TR-20 and Hydrocad computer models. Specific site examples will be used for in-class, hands-on design problems.

WATER COURSE HYDROLOGY AND HYDRAULICS I-406A

The HEC-RAS computer program is a powerful tool developed by the USACE to model river hydraulics and hydrology. Participants will be introduced to the fundamental components and organization of the program. An understanding of basic hydraulics and watershed hydrology is necessary. Attendees will learn how to generate hydraulic profiles for simple water courses using actual design examples.

WATERCOURSE HYDROLOGY AND HYDRAULICS II-406B

This workshop will build on the skills covered in Water Course Hydrology and Hydraulics I using the HEC-RAS computer program to model more complex water courses with multiple branches, culverts and bridges. Numerous design examples of actual site conditions will be used.

ADVANCED WATER COURSE HYDROLOGY AND HYDRAULICS I-407A

The new NYS-DEC dam safety regulation requires that an emergency action plan be developed for any significant impoundment structure in a water course. The plan must include an assessment of downstream impacts resulting from its failure. Participants will learn how the HEC-RAS program is used to model dam breaches and establish downstream inundation plans using actual condition examples.

ADVANCED WATER COURSE HYDROLOGY AND HYDRAULICS II-407B

Many developments impact or are impacted by 100-year flood plains that are established and regulated by FEMA. The foundation for establishing flood plain boundaries and elevations is the HEC-RAS (or its predecessor HEC-2) computer model. Attendees will be familiarized with the procedures for computing and modifying regulated flood plains and flood ways using HEC-RAS in accordance with FEMA requirements. Actual real-life examples will be used as class problems.

THE PREPARATION AND IMPLEMENTATION OF SWPPPs-412B

The Stormwater Pollution Prevention Plan (SWPPP) is the cornerstone of any development project's strategy for managing stormwater. This class will detail the steps necessary to prepare a SWPPP in accordance with the NYS-DEC GP-08-01 Permit requirements and provide hands-on instruction for SWPPP inspections on actual construction sites.

ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDD&E)414

Illicit discharges of pollutants through municipal and private storm systems can be a major source of contamination to our streams, lakes, wetlands, oceans and rivers. This workshop will provide hands-on field experience in the techniques for detecting illicit discharges and tracing the pollutant path back to its source. Methods for municipalities to enforce and eliminate such discharges as required by GP-08-02 will be presented and discussed.