

Caribbean Institute for Meteorology and Hydrology Husbands, St. James

Flood Hazard Mapping Distance Learning Course *October 5 – October 30, 2015*

Facilitator(s):

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AIMS AND OBJECTIVES

The **Flood Hazard Mapping (FHM)** course aims to provide participants with an introduction to some tool sets and functions within GIS and Hydrology software packages that may be used effectively for the purposes of flood analysis and mapping. Participants will learn a workflow process that involves the combined use of ArcGIS, HEC-HMS, HEC-RAS and HEC-GeoRAS software to generate a flood hazard map using watershed, hydro-meteorological and topographical data. The **Flood Hazard Mapping** distance learning course is targeted at persons in hydrology related fields with some degree of GIS experience but limited experience in flood mapping or use of HEC software.

LEARNING OUTCOMES

At the end of the course the participant will be expected to be able to:

1. Produce watershed profile data from topographical layers in ArcGIS
2. Undertake a basic hydrological analysis using the HEC-HMS rainfall runoff model
3. Conduct a surface flow analysis using HEC-RAS software
4. Process flood analysis data and generate a flood hazard map with ArcGIS and HEC-GeoRAS software

COURSE DELIVERY AND CONTENT

The duration of the course is four (4) weeks. The course will be delivered through an online learning facility and will consist of synchronous and asynchronous sessions. As such, participants are encouraged to manage their time efficiently. Participants will require access to a computer with connection to the internet, ArcGIS software (version 9.3 or above) and Hydrologic Engineering Center (HEC) software (HEC-HMS, HEC-RAS and HEC-GeoRAS - freely obtained from <http://www.hec.usace.army.mil/software/>). Participants will be encouraged to use the student forums and other online facilities to communicate and participate in group discussions.

- Week 1 – *Watershed Analysis using a DEM*
- Week 2 – *Runoff Analysis*
- Week 3 – *Surface Flow Simulation with HEC-RAS*
- Week 4 – *Flood Analysis and Mapping with ArcGIS and HEC-GeoRAS*

LEARNING HOURS

Supervised sessions

10-20 hours

ASSESSMENT

The course will be assessed through the completion of online quizzes and assignments. Participants are required to complete **ALL** assessments in order to successfully complete the course.

COURSE MODULE DESCRIPTIONS

Module	Description
Module 1 – Watershed Analysis using a DEM	Participants will learn to: 1) Extract the basin area of a target river system using a DEM, 2) Perform basic hydrological analysis and 3) Extract watershed profiles for runoff analysis.
Module 2 – Runoff Analysis	This module focuses on: 1) What is runoff analysis?, 2) Using GIS analysis to create a HEC-HMS basin model, 3) Creating a HEC-HMS meteorological model based on daily rainfall data 4) Defining a HEC-HMS control specification and conducting a runoff analysis using HEC-HMS
Module 3 – Introduction to HEC-RAS	A basic introduction to the HEC-RAS software application is provided with a demonstration on how it may be used to conduct an unsteady flow simulation.
Module 4 – Flood Analysis and Mapping with ArcGIS and HEC-RAS	The final module in the course introduces HEC-GeoRAS which is a “go-between” software application that handles the exchange of content between ArcGIS and HEC-RAS. Participants will use HEC-GeoRAS to facilitate the running of flood simulation models with HEC-RAS and mapping of results with ArcGIS.