CORE CURRICULUM

Development Objectives

The current trend across the Corps is for District planning functions and organizations to have a larger percentage of young and/or inexperienced planners than in the past. In addition, the duration of employment is decreasing and there will be fewer full career employees, as we move into the 21st Century. These trends require that planners must achieve a **"full performance"** level in a much shorter period of time. The planner should be able to function at a journeyman level at the end of a three-year period, rather than the current ten to fifteen year period that it seems to take. For these new/inexperienced planners to function at a full performance level within three years, there is a need for some **"basic training"** in the Corps planning process and policies, plan formulation and economic and environmental evaluation procedures, and the processes for the development and authorization of a Civil Works project. **The primary objective of the core curriculum is to provide for the basic, formal training needed for the entry level planners to move to the journeyman planner stage of development.**

Curriculum Elements

The core curriculum includes a suite of eight courses and workshops that all planners should be required to take, or at least strongly encouraged to take, in order to have a common base of knowledge in all the basic Planning Knowledge, Skills, and Abilities (KSA's). All of these courses should be taken during the first three years of assignment to CW Planning. This suite of courses and workshops are identified below. Each is under development.

Courses and Workshops

Your comments and suggestions are invited - see each course page for details.

Introduction to Planning (IP): A 2-day planning workshop for new planners. Subject matter to include discussions regarding basic planning principles (What is Planning?), planning functions (Who is a Planner?), planning's responsibilities in the Project Delivery Process (What does a Planner do?), and introduction to the six-step planning process (How is Planning done?)

Planning Orientation Workshop (PW): A 4-day workshop for new planners. Subject matter includes the 21 steps to success in the development of a Civil Works project. This includes introduction to the authorization and appropriation process.

Planning Process (P2) A 4-day workshop addressing CW policies and requirements of the Planning Guidance Notebook.

Plan Formulation Workshop (PF) A 4-day workshop addressing the entire plan formulation process as it applies to the Corps multi-purpose plan formulation requirements. While the course outline covers the four project purposes of ecosystem restoration, flood damage reduction, inland navigation, and deep draft navigation each session will be modified to cover ecosystem restoration and one of the other three project purposes.

Public Involvement & Teaming in Planning (PI) A 4-day workshop on public involvement techniques and processes, negotiations and conflict resolution. Course to provide detailed

discussions and class room exercises on workshop/public meeting formats, team building, active listening, developing a win-win position, what makes a successful public involvement program, etc.

Environmental Considerations for Planning (ENV) A 4-day workshop for apprentice level planners on NEPA process and environmental analysis. This course provides detailed discussions on the authorities, procedures, and methods of environmental analysis.

Hydrology and Hydraulics for Planning (HYD) A 4-day course to provide a basic understanding of basic hydrologic and hydraulic concepts as they are applied to water resource planning.

Economic Analysis in Planning (ECO) a 4-day workshop to provide detailed discussions on the concepts and methods used in the economic analysis of water resources projects, including risk-based analysis. The course covers basic economic concepts and methods of computing the economic costs and benefits for various type projects.

Delivery System

Most of the courses making up the core curriculum are or have been in the Corps' "Prospect" program. For example: the existing prospect course on Planning Principles and Procedures provides training on the basic planning process. The existing prospect training course on Civil Works Orientation provides training on the development of a Civil Works project. To the extent that there is continued interest (as expressed in the annual training survey) for these courses, they should continue to be given for planners and non-planners alike.

However, in looking at a "rapid response" delivery of the core curriculum courses over the next three years, and the need for development of several new courses, the existing prospect courses and its current method of delivery do not meet planning's short-term needs. This type of training is generally considered far too expensive to develop and deliver, is not responsive to need based (on-demand) training, is usually not provided locally when and where needed and is limited in its ability to reach a specific large audience on a timely basis.

Currently, there are numerous workshops and seminars provided in the districts by HQUSACE and MSC staffs, as well as by senior district staff members. Chief among these workshops are the two-day Planning Workshop that was provided by IWR, the Project Development Process Workshop provided by an ad hoc team of HQUSACE and MSC representatives, and the three-day CW Orientation Seminar conducted by proponents of the prospect course concerning the same subject. These workshops and seminars are taken on the road to the districts and division offices and have proven to be very popular and cost effective (ranging about $200+ per student). Formalization of this ad hoc approach is the basis of the model being employed for the rapid response deployment of the core curriculum courses and workshops.

With the ever increasing burden of reduced training and travel budgets, locally and/or regionally hosted training courses and workshops offer an opportunity to obtain a substantial amount of training for planners at a relatively low cost.

The core curriculum will be scheduled in a manner to permit a new planner to complete the 8 course curriculum within 2 ½ to 3 years without having to travel outside the MSC boundaries. One of the curriculum courses will be scheduled in the recommended order of presentation to be available somewhere in each MSC every 90 days.

“Rapid Response” Deployment Plan Concepts

Each course or workshop included in the core curriculum has a course proponent with the assigned responsibility for the development, delivery and continuous maintenance of course materials. This course proponent also will serve as the lead instructor for the assigned course. A registry of active proponents for each course will be maintained by the HQUSACE Chief, Planning and Policy Division.

The overall administration of the core curriculum will be at the direction of the HQUSACE Planner’s “Training and Development Proponent,” working under the oversight of the “Training and Development Advisory Board for Planning.” This board consists of the HQUSACE and MSC Planning and Policy Chiefs (or their reps), IWR representative, plus the HQUSACE Planning Training and Development proponent. The group will meet annually or semi-annually in conjunction with the MSC Planning Chief’s meetings.

The instructor team for each class will normally come from a pool of 8-10 instructors certified to deliver the course. The instructor team could include contractors; HQUSACE, IWR, and/or MSC staff; members of UCOWR; and/or senior level planners from the districts. Each of these instructors will have attended a Train-the-Trainer seminar for teaching subject course. The first session of each course/workshop should be held as a Train-the-Trainer session for all instructors before taking the training on the road to the MSCs. Typically the workshop will be delivered to the MSCs using three instructors, including at least one HQUSACE representative. It is also desired to have a practicing planner assisting in teaching each course, if possible.

The instructor pool concept is intended to assure that the training maintains high standards, consistently applied Corps-wide. The instructor pool contains MSC and HQ personnel, which should communicate the importance the Corps gives to the program, underscores the Corps' commitment to the program, and lends legitimacy and authority to the material being presented. Keeping course material current and relevant is also made easier under the constant supervision of a smaller group of responsible presenters.

In addition, presentations and course material should be posted on a web-site so that all trainers may have access to the latest information. Updates would be explained so that the information will not grow stale.

PLANNING PRINCIPLES AND PROCEDURES

Purpose
This course provides district and division planners with an overview of how Corps of Engineers water resource projects are planned in accordance with current policies and procedures.

Description
The principles and policies guiding the plan formulation and evaluation process are discussed in a series of short presentations by HQUSACE staff and through class participation in small group exercises. Presentations and class exercises focus on case studies designed to illustrate the planning process and application of guidance and policy. The course presents the basic procedures that enable the student to conduct the planning process under today's requirements. The course covers interaction among the district, division, HQUSACE, Army, and the Administration, and includes a session on new directions in planning. The course is conducted in an informal atmosphere to encourage class interaction.

Prerequisites
Nominees must be assigned (a) Occupational series: selected 0020, 0100, 0400, 0800 and 1300; (b) Grade: GS-05 or above. Participants should be familiar with ER 1105-2-100, Guidance for Conducting Civil Works Planning Studies, and be currently involved in Civil Works Planning.

PLAN FORMULATION WORKSHOP

Workshop Format
The plan formulation workshop will be a 4-day course, taught in standard format using lectures, case studies, and exercises to groups of approximately 30 students. In most instances, students will come from the same MSC. Corps planning experts augmented, in some cases will teach workshops, by recent retirees will teach workshops. While the workbook and supporting instructional materials will cover the high priority mission areas of navigation, flood damage reduction and ecosystem restoration, each session of the workshop will only present ecosystem restoration and one of the other high-priority project purposes (selected on the basis of regional interest). Then, by combining the two purposes, multi-purpose plan formulation would be covered. **Participants should leave these courses with the knowledge that will allow them to formulate the NED, NER, and NED/NER plans.**

Annotated Outline/Instructor Guidebook - 2nd draft (5MB)

Student Workbook

Introduction

General Plan Formulation

- What is Plan Formulation
- Key Concepts and Terminology
- How to Identify, Measure and Build Them into Plans

Environmental Compliance

- Opportunities and Constraints of Laws and Regulations
- Mitigation - Policies and Strategies

Ecosystem Restoration

- Authorities and Policies
- Problem Identification/Inventory and Forecast for Formulation
- Formulation - Measures and Strategies
- Cost Effectiveness/Incremental Cost Analysis and the NED Plan

Flood Damage Reduction

- Authorities and Policies
- Problem Identification, Inventory and Forecast for Formulation
- Formulation - Measures and Strategies
- Reformulation - Optimization, Incremental Analysis and Selection of the NED Plan

Navigation – Harbors

- Authorities and Policies

- Problem Identification, Inventory and Forecast and Determination of Objectives and Constraints
- Formulation - Measures, Strategies and Plans
- Reformulation - Optimization, Incremental Analysis and Selection of the NED Plan

Multipurpose

- Multi-purpose Plan Formulation - Policies and Constraints
- Cost Allocation
- Trade-off Analysis and Selection

Exercises - Murrieta Creek Flood Control Feasibility Study

- Exercise 1
- Exercise 2
- Exercise 3
- Exercise 4
- Module MX: Murrieta Creek Hands-on Exercise
- Module XER: Incremental Analysis Exercise with IWR Plan

Planning Manual and Guidance

- Planning Manual
- Planning Primer
- Policy Review Checklist
- ER 1105-2-100
- ER 1105-2-100A
- ER 1105-2-100B
- ER 1105-2-100C
- ER 1105-2-100D
- ER 1105-2-100E
- ER 1105-2-100F
- ER 1105-2-100G
- ER 1105-2-100H
- ER 1165-2-1

PUBLIC INVOLVEMENT & TEAM PLANNING

Four-day workshop, focused on providing apprentice-level planners with a better understanding of the importance of involving stakeholders in the planning process, how a public participation strategy can be developed, and providing familiarization with basic involvement tools and approaches. Also provided are basic concepts of conflict resolution. Special topics considered are dealing with the local sponsor, and applying consensus building principles on the PDT.

Main Topics

- Rationale for public participation in the planning process
- Legal requirements, policy
- Role in stages of planning process
- Key principles of involvement and consensus-building
- Designing public participation programs
  -Basic tools (meeting design, etc.)
  -Other approaches (shared vision planning, etc.)
  -Use of web-based participation strategies
- Working with local sponsors
- Interagency coordination and collaboration
- Coping with conflict
  -Sources of conflict
  -Resolution strategies
- Applying consensus building principles in the PDI

CLASS MATERIALS

Workbook

Class Slides

- in Powerpoint (83 MB - long download)
- in PDF (5MB)

NEPA

Special Issues

Class Exercise

Example - San Diego

Course Survey - What do you think should be presented in the course?

ENVIRONMENTAL CONSIDERATIONS IN PLANNING

Course Outline

I. Introduction to Planning and Selected Concepts Related to Environmental Considerations of the Army Corps of Engineers Civil Works Mission.
   - A. Philosophy of the National Environmental Policy Act
   - B. Mission Summary of the Corps' Planning Process
   - C. The 6 Step Planning Process
     1. Overview of the process
     2. Origin in Principles and Guidelines
     3. Relationship with The National Environmental Policy Act
     4. Relationship with the Budget Process
     5. Cost sharing and the Planning Process
   - D. Introduction, Review and Approval of the Corps of Engineers Civil Works Reports, their Terminology and Environmental Compliance Requirements.
     1. Reconnaissance Reports: PRPs, IARs, 905(b) Reports
     2. Feasibility Reports: ERRs, DPRs, FRs
     3. Preconstruction, Engineering and Design (PED)
     4. Post Authorization Change Reports, GDMs etc.
     5. Project Reevaluation Reports: LRRs and GRRs
     6. Report of the Chief of Engineers
     7. Continuing Authorities
   - E. Mitigation Planning
   - F. Overview of Civil Works Planning Terminology/Concepts as related to Environmental Considerations.
     1. NED versus NER Plans
     2. Benefit Cost versus Cost Effective Planning
     3. Incremental Cost Analysis and the IWR Plan
     4. Trade-off Analyses
     5. Federal Interest Determination
     6. The Determination of Significance in the Decision Process
     7. Determination of Significance for Ecosystem Projects:
        - a. Institutional
        - b. Technical
        - c. Public
   - G. Report Preparation Recommendations, "Telling the story".
     1. CEQ Regulations and ER 200-2-2
     2. Defining NEPA Formats
     3. Integration of NEPA documents
     4. Incorporation by Reference
     5. Tiering
     6. Incomplete or Unavailable Information
     7. "Reasonable and Foreseeable Impact Analysis"
   - H. Quality Control & Quality Assurance
     1. District Role
     2. MSC Role
     3. Report hurdles to be met at HQUSACE, ASA(CW) and OMB

II. Documentation Requirements for Environmental Compliance of the Civil Works Planning Process.
   - A. National Environmental Policy Act (selected aspects)
     1. Purpose
        - a. Action Forcing Provisions

b. Statutory Basis
c. Agency Authority

2. NEPA Implementation Procedures; Appendices I, II and III
   a. Agency NEPA Contacts
   b. Agencies with Jurisdiction by Law or Special Expertise
3. Lead Agency Responsibility
4. Cooperating Agencies
5. FONSI and the Environmental Assessment
6. Categorical Exclusions
7. Scoping to Identify Project Issues and Solutions
8. Major Federal Action
9. Notice Of Intent to Prepare an EIS
10. The Environmental Impact Statement
    a. Format

    1) Summary
    2) Purpose and Need
    3) Project Alternatives
    4) Affected Environment
    5) Environmental Consequences
       - Direct Impacts
       - Indirect Impacts
       - Cumulative Impacts
    6) List of Preparers
    7) Appendices
       - Page Limits
       - Time Considerations

11. Circulation and Public Review
    a. Filing the EIS
    b. Notice of Availability
    c. Time frames
12. The EPA Review Process
    a. Section 309 of the Clean Air Act
    b. Review standards
13. Records of Decision
14. Council On Environmental Quality's 40 Questions and Answers
15. Purpose of the Corps of Engineers Procedures for Implementing NEPA
    a. Categorical Exclusions
    b. Processing the NEPA Document
    c. Limitations during Processing Periods
    d. Who Signs the FONSI/ROD
16. Supplements to the EIS
17. Referral "When all else fails"
    a. How to Avoid
    b. Why to Avoid
    c. Getting Sued

B. Endangered Species Act (ESA)
   1. Section 7 Consultation Processes
   2. Biological Assessment
   3. Biological Opinion

4. Jeopardy Opinions
5. Taking
6. Agency Responsibilities
   - Consultation
   - Conservation Recommendations
   - Reasonable and Prudent Alternatives
7. The God Squad
8. National Marine Fisheries Agencies Requirements

C. Clean Water Act (CWA)
1. 404 (b)1 Evaluation,
2. 401 Certification
3. 404(r) Exemptions
4. State Water Quality Certification

D. Fish and Wildlife Coordination Act (FWCA)
1. Planning Aid Reports
2. 2(b) Reports
3. Role of the State in the FWCA
4. Transfer Funding Agreements
5. National Marine Fisheries Agency Requirements

E. Magnuson-Stevens Act (MSA)
1. Essential Fish Habitat (EFH)
2. EFH Assessment
3. Consultation Requirements of the National Marine Fisheries Service
   - Integration with NEPA Circulation Requirements
   - Conservation Recommendations

F. Clean Air Act (CAA)
1. Ambient Air Standards-Attainment/non-attainment zone
2. State Implementation Plans
3. Section 176(c) Statement of Conformity

G. National Historic Preservation Act (NHPA)
1. Section 106 Review Process
2. Advisory Council of Historic Preservation
3. State Historic Preservation Officer
4. The Keeper
5. Consultation with Federally Recognized Indian Tribes
6. One percent, 100 percent Federally funded data recovery

H. Coastal Zone Management Act (CZM)
1. State Coastal Consistency Determination
2. State Agency Consultation Role

I. Wild and Scenic Rivers Act (WSRA)
1. Wild, Scenic, Recreational Designations
2. Consultation Requirements

J. Farmland Protection Act
1. Farmland Conversion Impact Rating Form AD 1006
2. Consultation Requirements

K. Marine Protection Research and Sanctuaries Act
1. Section 103 Ocean Disposal Evaluation of Dredge Material
2. Disposal Site Designation and Testing Criteria

L. Other Compliance Regulations

M. Project Cost Share Agreement's (PCA's) Checklist
   1. Project Approval for Execution
   2. Dates of Environmental Compliance

III. Specific Ecosystem Planning Policies of the Corps of Engineers

A. WRDA 1986
   1. Fish and Wildlife Mitigation Section 906
   2. In-kind Mitigation of Bottom Land Hardwoods
   3. In-kind Credit and the Planning Process

B. Wetlands "No Net Loss"

C. Mitigation Ratios and Functional Replacement Basis

D. Scoping to Identify Project Issues and Solutions

E. Mitigation Policy for Ecosystem Restoration Projects

F. Hazardous, Toxic and Radioactive Wastes Policy

G. Sustainable Development

H. Interagency Collaboration
   1. Partnerships (Who, How to develop partnerships)
   2. Formal Partnerships: Coastal America, Clean Water Action Plan, American Heritage Rivers, Great Lakes, Chesapeake Bay, etc.
   3. Typical restoration partners: FWS, State, NRCS, Districts, Local Watershed Groups, etc.
   4. Missions Overviews of Federal Agencies with Major Interaction with the Corps of Engineers
      - United Fish and Wildlife Service
      - National Marine Fisheries Service
      - Federal Emergency Management Administration
      - Environmental Protection Agency
      - Natural Resources Conservation Service

I. Ecosystem Restoration Authorities
   1. General Investigation (GI)
   2. Congressional Adds
   3. Continuing Authorities
      - Section 1135, WRDA 1986
      - Section 206, WRDA 1996
      - Section 204, WRDA 1992
   4. Examples of Restoration Projects/techniques used by the Corps
      - Wetland Restoration,
      - Stream Restoration,
      - Migratory Fish Passage
      - Dam Removal

IV. Steps and Considerations for Selecting an Ecosystem Assessment Methodology.

A. Introduction on need for function assessment.
   1. Defining and measuring project outputs
      - Functional capacity, biological integrity, structural success, functional value, habitat suitability
      - Defining the stages when function can be measured during the planning process.
   2. Review considerations (e.g., regional vs. national model, wetland class, time/monetary constraints, etc)

B. Comparison of approaches
   1. Habitat Evaluation Procedures (HEP)
   2. In-stream Flow Incremental Methodology (IFIM)

3. Index of Biological Integrity (IBI)
4. Hydro-geomorphic Approach Methodology (HGM
5. Wetland Evaluation Technique (WET)
6. Others

C. Classroom exercise: 1 or 2 examples of planning projects.

1. Historic project: Critique approach used and propose alternative approach based upon current approaches. Review constraints of project (e.g., number of wetland sites, time and cost per assessment site, time constraints).
2. Example of simple project with relatively straightforward solution
3. Example of difficult project involving need to develop modified assessment approach.

HYDROLIC ENGINEERING FOR PLANNING PROPOSED WORKSHOP OUTLINE

Description

The emphasis of the prospect course on technical applications such as unit hydrographs, flow frequency curves, etc., will be shifted for the workshop to provide more of an overview of such topics. Emphasis will be placed more toward planning tasks.

Hydrologic analysis is a key part of the foundation for project analysis. The interaction of the hydraulic engineer with the rest of the study team while obvious, will also be emphasized..

While most of the workshop emphasis will focus on riverine flooding, this workshop will include information on coastal and hurricane flooding and the physical oceanography of tides and waves.

With the current emphasis on environmental issues, the section on environmental studies will include more instruction on how the hydrologic analysis of such studies should be conducted including available models, etc. Such topics as computing the 5% inundation during the growing season for jurisdictional wetlands, hydrologic analyses for quantifying the impacts of reducing the frequency and duration of flooding during critical times of the year on fish and waterfowl, and the availability of habitat will be included.

The course will also include a session on basic fluvial geomorphology and its impact on design considerations.

In general, Corps' planners need to have a general overview of practical hydrologic engineering applications as it relates to the various planning studies. It is not our intent to make a hydrologist or hydraulic engineer out of the planner but to provide basic knowledge. Teamwork will be stressed.

The increasing role of GIS and other emerging technologies will also be recognized.

In workshop discussions, planning requirements for CAP studies should be included (level of detail). Recognize the need for early participation of planning, and H&H with the local sponsor to identify possible causes of the problems and potential solutions.

A discussion of the independent technical review (ITR) process will also be incorporated into the discussions.

Economic Analysis in Planning

Course Outline, Session Modules, and Learning Objectives
DRAFT – 20 July Version

Course Objectives: To provide an overview of the requirements, process, and procedures for conducting economic analysis of Corps of Engineers water resources planning projects. It is intended to give new economists and planners insight into the economist's roles in the planning process, along with an overview of the economic principles, models and tools used in economic analyses. Some form of economic analysis, including benefit/cost analysis, cost effectiveness analysis and economic impact analysis is required for all Corps projects. The course will provide a general overview of evaluation procedures for all of the major project purposes of Corps water resource projects; flood control, navigation, environmental restoration, recreation, water supply, and hydropower.

Module 1: Administrative and Introductions. This module will provide the opportunity for introducing workshop instructors and course participants. The purpose and overview of the workshop will be presented and a description of how it relates to other workshops in the Planners' Corps Curriculum will be provided. An overview of other economic courses that are presented under the PROSPECT program or other programs will be presented. All administrative details will be discussed.

Learning Objectives: Familiarize the student with the purpose of this workshop and how it relates to other available training. Foster an interactive learning environment by introducing the student to other participants.

Topics covered:
· Introduction of instructors and participants
· Other Planning Courses and PROSPECT classes
· Administrative items

Module 2: Role of Economics. This module will discuss the role of the economist as a member of the project development team. The lecture will emphasize the importance of interfacing with other team members, the public, and the sponsor. A brief historical perspective of the role of economic analysis in civil works project development, highlighting changes in evaluation requirements will be presented.

Learning Objectives: To provide the student with a keen awareness of the team concept of planning and the role the economist may play on the team. Acquaint the student with the types of analyses economists provide and how economic analyses have changed over the years.

Topics covered:
· Team Concept – Project Management BP
· Engineering, Planning Interface
· Historic Perspective

Module 3: Evaluation Concepts. This module will reference appropriate guidance for economic analysis. The critical elements of the economic analysis process will be presented with particular emphasis on the Principles and Guidelines. The six step planning process will be briefly described and reference made to the Planning Process Workshop for more detail. The fundamental requirements of inventory and forecasting the future with and without project conditions will be discussed. A forecasting exercise will be done. The selection and use of critical variables will be discussed. The concepts of time value of money, base year, period of analysis, interest rates and risk analysis will be presented.

Learning Objectives: After this session the student will have a relatively in-depth understanding of the importance of several key elements of the economic evaluation analysis; namely the future with and without project conditions, forecasting, and adjustments to account for the time value of money.

Topics covered:
· Principles and Guidelines
· Planning Process (Summary)
· With/Without Project Conditions
· Forecasting (Definitive lecture)
· Risk Analysis (General concepts here, covered in 5 below)
· Base Year
· Period of Analysis
· Interest Rate

Module 4: Economic Analysis in Planning. This module will provide a general overview of economic theory with the intent to explain the outputs of the economic analysis, how they are used in water resources planning, and their importance in decision making. A more extensive presentation will be provided in the workbook for students who are interested. The concept of willingness to pay will be discussed in detail. Distinctions between National Economic Development and Regional Economic Development costs and benefits will be a major emphasis of this module. The nature, history, and appropriate use of Benefit to Cost Analysis will be presented. A fairly detailed presentation of the Corps of Engineer's cost allocation process will be presented.

Learning Objectives: The student should have a reasonable understanding of what economists measure and why it is important to distinguish this in Corps studies.

Topics covered:
· Economic Theory (Welfare Economics, Willingness to Pay, Consumer/Producer Surplus, Market & Non-Market (Contingent Value))
· Benefit Cost Analysis (Definitive lecture)
· Cost Effectiveness/Incremental Cost Analysis
· NED and RED Distinctions
· NED Costs
· Social Analysis
· Multipurpose Projects (Minor lecture, example in plan formulation)
· Cost Allocations (Definitive lecture, example provided in plan formulation)

Module 5: Risk Analysis. This module will discuss the general framework for risk analysis in Corps water resources planning studies. Procedures and critical variables for risk assessment will be described. Tools available to conduct risk analysis will be presented and briefly discussed. Students will be referred to the PROSPECT courses on risk analysis for more details on applications for flood damage prevention, navigation and ecosystem restoration studies.

Learning Objectives: Familiarize course participants with the basic requirements of risk analysis and available tools.

Topics covered:
· General Risk Analysis Framework
· Risk Assessment
· Risk Management
· Risk Communication
· Risk Analysis Tools

Module 6: Flood Damage Reduction. This module will address specific technical and policy requirements for conducting economic analysis for urban, agricultural and coastal flood damage prevention studies. Primary benefit categories and procedures will be discussed. Risk analysis framework and requirements will be presented. NED cost considerations will be discussed.

Learning Objectives: Participants will gain a basic understanding of NED benefits and costs for flood damage reduction studies and of acceptable procedures and tools available to conduct the economic analysis.

Topics covered:
· Urban Damage Reduction
· Agricultural Damage Reduction
· Hurricane and Storm Damage Prevention (Coastal)

Module 7: Navigation. This module will address specific technical and policy requirements for conducting economic analysis for deep draft and inland navigation studies. Primary benefit categories and procedures will be discussed. Risk analysis framework and requirements will be presented. NED cost considerations will be discussed.

Learning Objectives: Participants will gain a basic understanding of NED benefits and costs for navigation studies and of acceptable procedures and tools available to conduct the economic analysis.

Topics covered:
· Deep Draft Navigation
· Inland Navigation

Module 8: Ecosystem Restoration. This module will discuss requirements, procedures and tools available to conduct cost effectiveness and incremental cost analyses for ecosystem restoration studies. The role of economists in this type of studies will be discussed.

Learning Objectives: Participants will learn the basic concepts and procedures to conduct cost effectiveness and incremental cost analyses.

Topics covered:
· Cost Effectiveness
· Incremental Cost Analysis (Conceptual basis and tools, definitive class is the IWR workshop, an example in to be presented in Plan Formulation Class)

Module 9: Other Civil Works Missions. This module will briefly discuss technical and policy requirements for conducting economic analysis for other civil works missions (low priority budget items). Primary benefit categories and procedures will be discussed. Risk analysis framework and requirements will be presented. NED cost considerations will be discussed.

Learning Objectives: Participants will learn the basic concepts and procedures to conduct economic analysis for water supply, hydropower, recreation and commercial fishing projects.

Topics covered:
· M&I and Agricultural Water Supply
· Hydropower
· Recreation
· Commercial Fishing

Module 10: Reporting Requirements. This module will discuss the scope of analysis and reporting requirements for various types of studies.

Learning Objectives: Participants will learn how to adjust the scope of analysis to the type of study being performed and the reporting requirements for each type of study.

Topics covered:
· Section 905(b) Analysis
· Recon Reports
· Feasibility Reports
· Major Rehabilitation
· Continuing Authority Program (CAP)
· Updating Requirement
· Local (MSC) Perspective on Review and Quality Assurance
· List of “Top 10 Items of Concern” in Economic Analysis