Introduction to Pavement Engineering and Management (IDM-31)

CLASS OUTLINE

Day 1 (two hours)
• **Module 1** Pavement overview
  o What are pavements
  o Functional requirements
  o What stakeholders want
  o Pavement types and key issues
  o Drainage
  o Pavement life cycle

• **Module 2** Pavement materials
  o Strength, stiffness, damage definitions
  o Soils and stabilization
  o Aggregate
  o Asphalt and asphalt mixes
  o Sprayed asphalt
  o Cement and concrete
  o Materials of the future

• **Module 3** Sustainability considerations
  o Cost sustainability and life cycle cost analysis (LCCA)
  o Environmental sustainability and life cycle assessment (LCA)
  o Environmental impacts of materials production and construction
  o Environmental Product Declarations

Day 2 (two hours)
• **Module 4** Traffic, Environment and Basics of Treatment Types
  o Treatment definitions
  o Pavement life cycle
  o Traffic variables
  o Climate variables

• **Module 5** Pavement Distresses for Asphalt Surfaced Pavement
  o Structural distresses
  o Surface distresses
  o Soils problems
  o Preservation and maintenance treatments
  o Decision tree logic to address distresses with preservation and maintenance
Day 3 (two hours)
• **Module 6** Rehabilitation and Reconstruction Design and Selection Process
  o Project investigation
    ▪ Desktop
    ▪ Site
    ▪ Sampling and testing
  o Examples of inadequate site investigation
  o Treatments
    ▪ Asphalt overlays
    ▪ Partial-depth reclamation
    ▪ Full-depth reclamation
    ▪ Concrete overlays
  o Decision logic

• **Module 7** Pavement Distresses for Concrete Surfaced Pavement
  o Concrete pavement distress mechanisms
    ▪ Design and construction
    ▪ Pavement design, jointing
    ▪ Mix design
  o Construction
  o Concrete pavement maintenance and rehabilitation

Day 4 (two hours)
• **Module 8** Pavement Distresses for Surface Treated, Gravel Surfaced and Permeable Pavements
  o Gravel and surface treated roads
    ▪ Distress mechanisms
    ▪ Engineered Gravel
    ▪ Unpaving to engineered gravel
  o Permeable pavement
    ▪ Distress mechanisms
    ▪ Functionality
    ▪ Use

• **Module 9** Overview of Pavement Management
  o What is a pavement management system
  o How a PMS works
    ▪ Framework
    ▪ Condition survey
    ▪ Decision trees
    ▪ Prioritization
Module 10 Overview of LCCA and LCA and How to Use This Information
  o Introduction to LCCA
  o Introduction to LCA
    ▪ How it works
    ▪ What to focus on now to improve sustainability
    ▪ EPDs

Overview of Other Pavement Courses in the CCPIC/Tech Transfer Program