Proposed Curriculum

Module One: Basics of Water Science

A. Water Facts
B. The Water Cycle
C. Surface Water
D. Groundwater
E. Groundwater/Surface Water Interaction
F. Water Quality
G. Water Use
H. Drought, Megadrought, and Climate Change

Module Two: Water Control, Capture, and Use

A. Federal Water Projects and Dam Operations
B. Storm Water Capture and Use
C. Wells and How They Are Drilled
D. Water Treatment Technologies and Facilities
E. Irrigation Systems
F. Water Measurement: Stream Gages, Water Meters, and the Like
G. Water Accounting and Decision Support Systems

Module Three: Overview of Water Law

A. Law Governing the Allocation of Water
    1. Surface Water
        a. Riparianism
        b. Prior Appropriation
        c. Hybrid Systems (*e.g.*, California, Oklahoma, Texas)
        d. Breakout unit for state-specific details [select state]
    2. Groundwater
        a. Absolute Ownership or "English Rule"
        b. Reasonable Use or "American Rule"
        c. Correlative Rights
        d. Prior Appropriation
        e. Restatement (Second) of Torts
        f. Statutory Systems (*e.g.*, Arizona, California, Colorado Non-Tributary Groundwater)
        g. Breakout unit for state-specific details [select state]
    3. Federal Reserved Rights
        a. Public Lands
        b. Indian Water Rights
B. Water Quality
    1. Federal Clean Water Act

2. State Water Quality Acts
3. Endangered Species Act

PHASE TWO:

Module Four: Administration of Water Rights in Prior Appropriation States

A. Perfection of Water Rights
    1. Water Rights Permits
    2. Pre-Permit Waters Rights; General Stream Adjudications
        a. Adjudicating Water Rights Claims Predicated on State Law
        b. Adjudicating Federal and Indian Water Rights Claims
B. Priority Enforcement
    1. Call on the River; Futile Call
    2. Procedure
    3. Mechanisms for Avoiding Priority Enforcement
        a. Reasonable Beneficial Use; Optimum Utilization
        b. Augmentation Plans, Substitute Supply Agreements and the Like
C. Changes in Purpose or Place of Use; Transfers of Water Rights
    1. Protection of Junior Appropriators; No-Injury Rule
    2. Limits on the Amount of Water Transferred
    3. Transfer in the Public Interest
    4. Anti-Speculation Doctrine
    5. Alternative Transfer Methods
D. Conjunctive Management of Surface Water and Tributary Groundwater
    1. Priority Enforcement
    2. Retirement of Surface Water Rights
    3. Augmentation Plans, Substitute Supply Arrangements
    4. Case Study: Conjunctive Management in Colorado's Upper Rio Grande Basin
E. Loss of Water Rights
    1. Forfeiture
    2. Abandonment
    3. Prescription

Module Five: Groundwater Administration

A. Fundamentals of Groundwater Hydrology (Adapted from Bench Book)
B. Groundwater Modeling (Adapted from Bench Book)
C. Case Management of Expert Testimony Predicated on Groundwater Modeling
D. Safe Yield and Sustainability
E. Groundwater Recharge
F. Confined Versus Unconfined Aquifers
G. Groundwater Management Districts

H. Domestic Wells
I. Case Study: California's Sustainable Groundwater Management Act

PHASE THREE:

Module Six: Environmental Flows: Protection of Watersheds and Their Associated Fish and Wildlife

A. Importance of Watershed Protection
B. Public Trust
C. Instream Flow Water Rights
D. Endangered Species Act
E. State Legislation Protecting Environmental Flows
F. Quantifying Legally Protected Environmental Flows
G. Water Rights as Constitutionally Protected Property Rights

Module Seven: Allocation of Interstate Waters

A. Congressional Apportionment
B. Interstate Compacts
C. Equitable Apportionment by the United States Supreme Court
D. Compact Enforcement Litigation
E. Equitable Apportionment Litigation

Module Eight: Water Cases as Complex Litigation

A. Lessons from the Manual for Complex Litigation
B. General Stream Adjudications
C. Court Challenges to Administrative Rule Making Proceedings
D. Case Study: Court-Mandated Collaboration Among Expert Witnesses in Colorado's Water Courts