[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

The subject of this course is the planning and management of water resource systems. The course will cover the topics of water planning and management by providing in depth coverage of the tools of analysis, namely optimization and simulation, and by providing the theoretical framework for analysis based on the economics of water and the design of water systems.

2. Course Goals and Objectives (Approximately 100 words)

At the completion of this course students should:
1. understand the fundamentals of economic theory as applied to water resources,
2. be familiar with optimization and simulation modeling,
3. be able to design and solve optimization models of water systems,
4. be able to conduct model-based analysis of integrated water resource systems
5. understand current issues of importance in water resources management, including water scarcity, ecohydrology and climate change.

3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

Vedula S. and Mujumdar P.P., 'Water Resources Systems: Modelling Techniques and Analysis', Tata-McGraw Hill, 2005.

4. Reference

Jain S.K. and Singh V.P., 'Water Resources Systems Planning and Management', Elsevier, The Netherlands, 2003.

Loucks D.P. and van Beek E., 'Water Resources Systems Planning and Management', UNESCO Publishing, The Netherlands, 2005.

5. Course Requirements and Grades

CAT 30%
EXAM 70%

6. Course Calendar

Week	Main Content
1	RESERVOIR OPERATION – STEADY STATE OPTIMAL POLICY
2	Multipurpose Reservoir Operation:Planning of multipurpose reservoir
3	WEIGHTING FUNCTION AND CONSTRAINT METHODS
4	REVIEW OF PROBABILITY THEORY: CONCEPT OF PROBABILITY
5	UNCERTAINTY AND RELIABILITY ANALYSIS:UNCERTAINTY
6	CHANCE CONSTRAINED LP - I; Chance Constraint
7	CHANCE CONSTRAINED LP - II;LINEAR DECISION RULE
8	STOCHASTIC PROCESSES & TRANSITION PROBABILITIES
9	STOCHASTIC DP: SDP - RESERVOIR OPERATION
10	INTRODUCTION AND RIVER BASIN SIMULATION
11	RESERVOIR OPERATION SIMULATION
12	PERFORMANCE MEASURES
13	FUZZY OPTIMIZATION
14	FINAL EXAMINATION