Advanced Water Circulation Engineering

2 units (selection)

Takao TAMURA · Associate Professor / Environmental Conservation Engineering, Civil and Environmental Engineering, Intelligent Structures and Mechanics Systems Engineering

Target〉 The objective of this subject is to learn models and theories on rainwater and solute runoff system in river basin.

Outline〉 The models and theories on rainwater and solute runoff system in river basin are introduced. The Muskingum method is a commonly used lumped flood routing method for handling a variable discharge-storage relationship. The kinematic wave model is the simplest distributed model defined by the continuity equation for an unsteady flow and the momentum equation assuming the friction and gravity forces balance each other. A report of solving problems related to lecture items is imposed.

Style〉 Lecture

Keyword〉 ***linear and non-linear lumped flood routing method, kinematics distributed flood routing method, rainwater runoff system in forested basin, solute runoff system in forested basin***

Relational Lecture〉 "**Applied Fluid Dynamics**"(0.7), "**Advanced Disaster Reduction Engineering**"(0.7)

Requirement〉 Fundamental knowlege of hydraulics, river engineering and numerical analysis is necessary.

Notice〉 not specified.

Goal〉

1. Understand the theory of both linear and non-linear lumped and kinematics distributed flood rooting models.
2. Understand the evaluation technique and study results on the water conservation function and the water quality conservation function of forests.

Schedule〉

1. Unit Hydrograph
2. Response Function
3. Unit Hydrograph Derivation
4. Lumped Flow Routing
5. Runge-Kutta Method
6. Muskingum Method
7. Linear Reservoir Model
8. Classification of Distributed Routing Models
9. Kinematic Wave Celerity
10. Analytical Solution of Kinematic Wave
11. Numerical Solution of Kinematic Wave
12. Muskingum-Cunge Method
13. Conservation function of forest
14. Water quality conservation function of forest
15. New development of water conservation function of forest

Evaluation Criteria〉 Reports

Textbook〉 To be introduced in the class.

Reference〉 To be introduced in the class.

Contents〉 http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216890

Student〉 Able to be taken by only specified class(es)

Contact〉

⇒ TAMURA (A414, +81-88-656-9407, tamura@ce.tokushima-u.ac.jp) Mail
(Office Hour: 年度ごとに学科の掲示を参照すること)