

13 RENEWABLE ENERGY: EXPLOITATION OF HYDRODYNAMIC AND MARINE ENERGY

Teachers: Chrysanthou V., Emeritus Professor
Lalikidou S., Candidate Doctor

The course covers the following topics:

1. Technical works for capturing, abducting and abducting water
2. Characteristics and types of reservoirs
3. Flood containment and water storage reservoirs design and dimensioning
4. Technical security projects - Dimensions of security launcher and floor evacuation
5. Topics (homework) on the design and dimensioning of reservoirs
6. Application of optimization methods to reservoir management
7. Regeneration tower: water level oscillation equations, hydraulic shock, unstable flow within closed conductors
8. Drop duct: pipe diameter selectors, static investigation of the duct supports
9. Spiral shell: specifying spiral shell rays
10. Hydroturbines: hydroturbine classes, action hydroturbine function, reaction hydroturbine function
11. Hydroturbine output conductor: output conductor configuration, cavitation
12. Marine wave motion, energy and power
13. Provisions for the generation of electricity through wave energy. Tidal wave power, tidal range power. Provisions for the generation of electricity through the tides. Numerical examples.

At the end of the course the student is competent:

- To possess knowledge for the design and dimensioning of flood containment and water storage reservoirs, as well as for the dimensioning of the safety drawer and the floor evacuator.
- Understand the parameters for the design and dimensioning of the regeneration tower and to study the propagation of the hydraulic shock.
- Apply the knowledge for the design, dimensioning and static investigation of the fall duct.
- Combine the knowledge for the design and dimensioning of the spiral shell.
- Evaluate knowledge on the selection of the type of water turbine.
- To evaluate the knowledge on the design and dimensioning of the outlet pipeline of the water turbine taking into account the phenomenon of cavitation.
- Possess theoretical knowledge of motion, energy and sea-wave power in order to understand how the relevant power generators operate.
- Possess theoretical knowledge of tidal current and tidal range power in order to understand how the relevant power generators are operated.

Teaching Mode: 3 hours suggestion-exercises / week