

## Fluid mechanics (ENVIRONMENT ENGINEERING, II<sup>TND</sup> YEAR, IV<sup>TH</sup> SEMESTER)

**Credit value (ECTS): 2**

**Course category:**

**Domain discipline (mandatory)**

**Course holder:**

**Professor Ph.D. RO CA RADU**

### Discipline objectives (course and practical works)

- knowledge and use of the specific concepts: fluid system, fluid particle, hydrostatic forces, equilibrium conditions of the systems of forces, fluid classification;
- knowledge and understanding of fluid mechanical states: fluid rest and motion;
- knowledge and use of motion equations for ideal fluids, continuity equation, Bernoulli equation for the permanent motion of incompressible fluids and its applications;
- knowledge of the main equipment of the hydraulic systems.

### Contents (syllabus)

Course
Generalities; properties of fluids (pressure, viscosity, superficial tension)
Fluid statics: hydrostatic pressure, Pascal's law, Archimedes' law, floating of bodies
Cinematics and dynamics of fluids: continuity equation, Bernoulli's law and its applications
Flow of the real fluids: Reynolds number, pressure losses, flow through pipes and open channels, flow through orifices
Positive displacement pumps; centrifugal pumps; design basics
Hydraulic motors
Control and metering devices (valves, distributors)
Practical works
International system of units. Symbols used in hydraulic and pneumatic diagrams
Pressure measurement (U-type manometer, micro manometer, Bourdon type manometer, pressure transducers) and flow measurement
Viscosity measurement
Calculation of pressure losses
Positive displacement pumps and motors: knowledge, theoretic flow
Centrifugal pump characteristics
Control and metering devices; understanding of hydraulic diagrams

### Bibliography

1. Arghirescu, C., D.C.C. Arghirescu, 1999 – *Bazele mecanicii fluidelor*, Editura Fundatiei Universitare "Dunarea de Jos" din Galati
2. Dimache A.N., Iancu I., 2014 – *Elemente generale de hidraulic*, Edit. Conspress, Bucuresti.
3. Florea, J., Panaitescu, V., 1979 – *Mecanica fluidelor*, Ed. Didactica si Pedagogica, Bucuresti
4. Florescu I., 2007 – *Mecanica fluidelor – note de curs*, Edit. Alma Mater, Bucuresti.
5. Ionescu, D., Matei, P., Todirescu, A., Ancusa, V., Buculei, M., 1983 – *Mecanica fluidelor in ma ini hidraulice*, Ed. Didactica si Pedagogica, Bucuresti.
6. Muntean Angela, Arsenie D.I., 2014 – *Probleme generale ale mecanicii fluidelor*, Edit. Matrixrom, Bucuresti.

7. **Ro ca R., Vâlcu V., 2000** – *Ac ion ri hidraulice i hidropneumatice*, Edit. Ion Ionescu de la Brad, Ia i.
8. **Ro ca R., 2015** – *Elemente de mecanica fluidelor i ac ion ri hidraulice*, Edit. Ion Ionescu de la Brad, Ia i
9. **Tac C., P unescu Mihaela, 2009** – *Ac ion ri hidraulice i hidropneumatice*, Edit. MatrixRom, Bucure ti

### Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Active participation to the lecture sessions	10%
	Final test	60%
Practical training	Active participation to practical training sessions	30%

### Contact

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