FLUID MECHANICS AND HYDRAULICS **(IInd Year, IVth SEMESTER)**

**Credit value** ECTS 3

## Course category

Speciality (Imposed)

**Discipline Code:** A.EMIAIA.D.208

**Course holder:**

**prof. PhD. Roşca Radu**

# Course objectives

The aim of the course is to introduce the students into the complexity of luid mechanics and its practical applications

# Contents (syllabus)

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| **Course (chapter/subchapters)** |
| Introduction. Physical porperties of fluids. |
| Hydrostatics (hydrostatic pressure, Pascal's law, Achimedes' law, floating bodies) |
| Fluid kinematics: continuity equation, Bernoulli's law and its practical applications. |
| Flow of real fluids: Reynolds' number, pressurelosses.  |
| Bernoulli's law for the flow of real fluids |
| Fluid flow through orifices. |
| Fluid flow through pipes; flow through open channels. |
| Hydraulic shock. |
| **Practical training** |
| International measurement system.  |
| Pressure measurement (U tube manometer, micromanometer, Bourdon type manometer, electrical pressure transducers); flow measurement. |
| Viscosity measurement |
| Pressure losses in pipe flows. |
| Positive displacement pumps: parts and calculation of theoretic flow. |
| Centrifugal pump characteristics. |
| Simplified calculation of a centrifugal pump. |

# References

1. Cazacu D. și colaboratorii, 2017 - *Tractorul pe înțelesul tuturor.* Editura PIM, Iași
2. Roşca R., Cazacu D. 2020 - *Construcţia tractoarelor* ", ed. a III-a. Editura Ion Ionescu de la Brad, Iași
3. Renius, K.T., 2020 – *Fundamentals of tractor design*, Springer, Cam, Switzerland.
4. Stout, B. A. (ed.)., 1999, - *CIGR Handbook Volume III.* American Society of Agricultural Engineers, St. Joseph, Michigan, USA.

**Final evaluation**

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| **Evaluation form** | **Evaluation method** | **Percent of final grade** |
| Course attending | - | 10% |
| Practical training | tests, activity | 30% |
| Exam | written test | 60% |

**Contact**

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