

# HYDROMECHANICAL EQUIPMENT

# HYDROMECHANICAL PROCESSES

## Courses

1. Introduction.
2. Flow in pipe. Basic equations. Friction losses. Basic calculations of pipes.
3. Gas flow in pipes. Basis of pipe networks calculation.
4. Flow of non-Newtonian fluids in pipes.
5. Calculation of pipes with pumps.
6. Flow in porous beds and packed columns.
7. Filtration.
8. Sedimentation. Hydraulic separation. Bubbling, bubble columns, flotation.
9. Separation of mixtures by centrifugal force.
10. Fluidization.
11. Mixing of liquids. Mixing in static mixers.
12. Fundamentals of particulate mechanics. Storage and transport of particulate materials.
13. Crushing and milling. Granulation. Separation. Mixing of particulate solids.

## Practice

1. Calculations of pipe and pipe networks.
2. Calculation of pipes with pumps.
3. Design calculations of cake and bed filters.
4. Settling velocity calculation. Design calculations of settlers and classifiers.
5. Design calculations of centrifuges and cyclones.
6. Calculation equipments with fluidized beds – *experimental work*.
7. Design calculations of mixing equipments – *experimental work*.

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Rieger, F., Novák, V., Jirout, T.: **Hydromechanické procesy I., II.** 1. vyd. Praha: Vydavatelství ČVUT, 2005. 209 p., 167 p., ISBN 80-01-03283-8.

Geankopolis, C., J.: **Transport Processes and Separation Process Principles.** 4<sup>th</sup> edition. New Jersey: Publishing as Prentice Hall PTR, 2003. 1026 p. ISBN 0-13-101367-X.

# 5 **HYDROMECHANICAL EQUIPMENT**

## ***Final examination***

### ***Written Examination ( $\Sigma$ 100 p.)***

- **Test (quiz)** – 15 questions (30 p.)
- **1<sup>st</sup> example** – computation of basic physical principles (30 p.)
- **2<sup>nd</sup> example** – computation of equipment design parameters (40 p.)

*For solve of **computation examples** It can be used yours supporting documents (e.g. notice from lectures, presentation, books...)!*

<b>CLASSIFICATION</b>		
<b>excellent</b>	<b>A</b>	<b>90 – 100</b>
<b>very good</b>	<b>B</b>	<b>80 – 89</b>
<b>good</b>	<b>C</b>	<b>70 – 79</b>
<b>satisfactory</b>	<b>D</b>	<b>60 – 69</b>
<b>sufficient</b>	<b>E</b>	<b>50 – 59</b>
<b>failed</b>	<b>F</b>	<b>&lt; 50</b>

# HYDROMECHANICAL PROCESSES

## *Final examination*

### **Written Examination ( $\Sigma$ 100 p.)**

- **Test (quiz)** – 15 questions (30 p.)
- **Example** – computation of equipment design parameters (30 p.)
- **Theoretical basic** – one theoretical question (40 p.)

*For solve of **computation examples** It can be used yours supporting documents (e.g. notice from lectures, presentation, books...)!*

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