

EPFL

SGM
Section de Génie mécanique

STI School

Dr. Elena Vagnoni

elena.vagnoni@epfl.ch

Hydraulic Turbomachines

Grande Dixence Dam, Switzerland
Lac des Dix $400 \cdot 10^6 \text{ m}^3$ Capacity

Teaching Assistants

- Aldo Leonardo Alerci, Au-1 7013
 - Aldo.alerci@epfl.ch
- Nathan Veuthey, Au-1 7013
 - Nathan.veuthey@epfl.ch

Syllabus

- 12 Sept.: L1 – Hydraulic Machines Introduction and Fields of applications
- 19 Sept.: L2 – Hydraulic Energy Conversion & Exercises
- 26 Sept.: L2 – Hydraulic Energy Conversion & Exercises
- 03 Oct.: L3 – Velocity Triangles & Exercises
- 10 Oct.: L4 – Pelton Turbines & Exercises
(Mr. Nicolas Gervais, Andritz)
- 17 Oct.: L5 – Cavitation in Hydraulic Machines & Exercises
- 31 Oct.: L6 – Reaction Turbines & Exercises

Syllabus

- 07 Nov.: L7 – Francis Turbines Design & Exercises
(Thomas De-Colombel, GE Renewable Energy)
- 14 Nov.: Visit Hydropower Plant (Alpiq)
- 21 Nov.: L8 – Industrial Pumps
- 28 Nov.: L8 – Industrial Pumps & Exercises
- 05 Dec.: L9 – Pumping Units & Exercises
- 12 Dec.: L10 – Experimental techniques and model testing
- 19 Dec.: Q&A and mock exam

Bibliography

- Moodle
- DIXON S.L. and HALL C.A., Fluid Mechanics and Thermodynamics of Turbomachinery, 7th Edition, Elsevier, 2013
- FRANC, J.-P., AVELLAN, F., La cavitation: mécanismes physiques et aspects industriels, Presses universitaires de Grenoble PUG, 1995.

Exam

- Divided in 2 parts:
 - First part: multiple-choice questions
 - Second part: problems to solve (similar to what we solve during the exercise sessions)
- 3 hours in total:
 - 45 minutes first part
 - 15 minutes break
 - 2 hours second part
- First part is close book
- Second part is open book – all the material can be used, printed or on the laptop offline
- Score:
 - 40% first part
 - 60% second part

EPFL



THANK YOU

**For your kind
attention**