

# Hydraulic Machinery Engineering 2019 Short Course

Date: September 2 - 6, 2019

Organized by EPFL

To be held at the EPFL Laboratory for Hydraulic Machines  
Avenue de Cour 33 Bis, 1007 Lausanne, Switzerland

## PROGRAM

Hydraulic turbomachines:

- Fundamentals;
- Hydrodynamics - Similitude – Cavitation.

Hydraulic turbomachinery engineering:

- Francis turbine runner;
- Pelton turbines;
- Centrifugal pumps.

Hydraulic turbomachines flow numerical simulations:

- Current and future tools;
- Industrial practice.

Model and Field Testing

- Reduced scale physical model instrumentation;
- Acceptance tests and specific tests;
- Hydroelectric power plant visit.

Operation Challenges

- Electricity market;
- Power system stability;
- Pumped storage power plants.

## CONDITIONS

Short course:

- Duration: 40 hours, 16 lecture modules, 1 site visit, 5 days;
- Prerequisite: Degree in engineering or professional engineering experience in industry;
- Language: English
- Certificate of attendance: at the end of the Short Course.



Registration

- Online at [https://lmh.epfl.ch/education/education-post-graduate-course/shortcourse\\_2\\_1/](https://lmh.epfl.ch/education/education-post-graduate-course/shortcourse_2_1/);
- By completing the attached form to be addressed to EPFL-LMH attention to Mrs. Isabelle STOUDMANN, Avenue de Cour 33 Bis, 1007 Lausanne/Switzerland, E-mail: [isabelle.stoudmann@epfl.ch](mailto:isabelle.stoudmann@epfl.ch), Tel.: +41 21 693 25 05, Facsimile: +41 21 693 35 54

Fees (VAT 7.7% not included)

- CHF 3'500.00 (per person, including technical documentation, technical visit, lunch and coffee break).
- CHF 3'000.00 for the second attendee of the same company or institute;
- Payment by bank or postal transfer in Swiss Franc (CHF) to Swiss Post, Postfinance SA, Mingerstrasse 20, 3030 Bern-Switzerland  
Swift/Bic [POFICHBEXXX](#), Account no: [17-714571-6](#), IBAN for Swiss Francs: [CH2709000000177145716](#)  
Reference: CC 0332 - Funds 111564 + invoice no. to be mentioned
- to be transferred before August 10, 2019

**Hydraulic Machinery Engineering  
 2019 Short Course  
 Time Schedule**

Week	Monday	Tuesday	Wednesday	Thursday	Friday
36	02.09.2019	03.09.2019	04.09.2019	05.09.2019	06.09.2019
07:30	<b>Visits</b>				
08:00	<b>Introduction to Hydraulic Turbomachines</b> F. AVELLAN (EPFL-LMH)	<b>Pelton Turbines Engineering</b> N. GERVAIS (ANDRITZ HYDRO)	<b>Hydraulic Turbine Engineering Design</b> F. MAZZOUJI (GE HYDRO FRANCE)	<b>Hydraulic Turbine Engineering CFD Analysis</b> C. SEGOUFIN (GE HYDRO FRANCE)	
08:15					
08:30					
08:45					
09:15	<b>Cavitation</b> M. FAHRAT (EPFL-LMH)				
10:15	Coffee Break (30 min)	Coffee Break (30 min)	Coffee Break (30 min)	<b>Bieudron Power Plant</b>	Coffee Break (30 min)
10:45	<b>Cavitation in Hydraulic Machines</b> J. NECKER (VOITH HYDRO)	<b>Hydro Energy Market</b> M. MURET (City Works of Lausanne)	<b>Hydraulic Turbine Engineering Dynamic Phenomena</b> P.-Y. LOWYS (GE HYDRO FRANCE)		<b>Advanced measuring and signal process. techniques (PIV, LDV, Pres., Wall Friction...)</b> M. FAHRAT & Doctoral Students (EPFL-LMH)
12:45	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
13:00					
13:30	<b>Model Testing &amp; On Site Measurements</b> A. MÜLLER (EPFL-LMH)	<b>Pump Design &amp; Selection Criteria</b> S. BERTEN (SULZER PUMPS)	<b>Transient Phenomena In Hydroelectric Power Plant</b> C. NICOLET (POWER VISION)	<b>Grande Dixence Dam</b>	<b>Conclusion</b>
15:15	Break	Break	Break		End of the Short Course
15:30	<b>Model Tests &amp; Cavitation Tunnel Demonstration</b> (EPFL-LMH)	<b>Numerical Simulations</b> C. MÜNCH (HES-SO) & Doctoral Students (EPFL-LMH)	<b>Variable Speed Pumped Storage and Electric Power Systems</b> B. MOREIRA (INESCTEC)		
17:15	<b>Welcome Party</b>				
19:00	<b>Dinner</b>				

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Registration Form  
e-mail: [info.lmh@epfl.ch](mailto:info.lmh@epfl.ch) - Fax: +41 21 693 35 54**

Title	<input type="checkbox"/> Mr. <input type="checkbox"/> Ms. <input type="checkbox"/> Mrs. <input type="checkbox"/> Prof. <input type="checkbox"/> Dr.
First Name	
Last Name	
Position	
Company Name	
Street, No	
City	
Zip Code	
Country	
Tel. (country + area code)	
Facsimile	
e-mail	

For hotel reservation, at your own expense, you may contact [Lausanne Tourisme](http://www.lausanne-tourisme.ch), [www.lausanne-tourisme.ch](http://www.lausanne-tourisme.ch), please be aware that there are many seminars in Lausanne during this period and hotel accommodation may be difficult in case of late registration.

Please take note that the EPFL-LMH is located downtown Lausanne, not on the main campus of EPFL in Ecublens. If you book a hotel room in Lausanne, you are eligible for the public transport card gratuity, valid for the duration of your stay.

Hotels situated nearby EPFL-LMH are the following:

- [Hotel Aulac, aulac@cdmgroupp.ch](mailto:aulac@cdmgroupp.ch)
- [Hotel Bellerive, info@hotelbellerive.ch](mailto:info@hotelbellerive.ch)
- [Hotel Agora Swiss Night, asn@byf.ch](mailto:asn@byf.ch)
- [Hotel A la Gare, info@hotelalagare.ch](mailto:info@hotelalagare.ch)
- [Hotel le Boulevard, info@boulevard51.ch](mailto:info@boulevard51.ch)
- [Hotel Victoria, info@hotelvictoria.ch](mailto:info@hotelvictoria.ch)
- [Hotel Carlton, contact@carltonlausanne.ch](mailto:contact@carltonlausanne.ch)
- [Hotel Elite, info@elite-lausanne.ch](mailto:info@elite-lausanne.ch)
- [Hotel Alpha Palmiers, ap@byf.ch](mailto:ap@byf.ch)
- [Hotel Continental, reservation@hotelcontinental.ch](mailto:reservation@hotelcontinental.ch)

Registration to reach our office by June 30 the latest, registration will be confirmed.

Payment in CHF, invoice will be sent per e-mail (pdf), please provide the invoicing address if different.

**NOTE:** Pour toute inscription acceptée et annulée par le participant, 10% du montant sera facturé.

For any accepted and canceled registration by the participant, 10% of the amount will be charged.