Course Registration Fees:

Full Rate	450,00 €*
Academic researchers, public employees	320,00 €*
Ph.D. Students, Postdocs (up to 30 y.o.)	200,00 €*
Graduate Students (up to 25 y.o.)	140,00 €*

Applicable reductions of registration fees (not cumulable):

- Participants from Developing Countries (OECD list) are entitled to 30% reduction.

- IWA or GITISA members are entitled to 20% reduction.

- Participants from Lake Como School Partner Universities (Como, Insubria, Milano-Bicocca and Pavia) are entitled to 25% reduction. Furthermore, 10 free seats are reserved, on a first-come basis, for PhD students from Partner Universities.

Registration fees include course attendance, course materials (on electronic support), onsite coffee breaks and lunch buffets. Each participant shall arrange and pay for own travel and accommodation.

*Fees are subject to additional Italian VAT at the current applicable rate (22% at the date of this announcement, pls. check with the secretariat for possible changes or exemptions foreseen by applicable laws). Fees must be paid to the secretariat immediately after online registration to secure attendance. A 50% administrative fee withholding will be applied to cancellations requested prior to July 15, 2017. No reimbursement will be made after that date, but changes of designated attendant are possible within the same participant category.

Course attendance is limited to 50 participants on a first-come basis. Graduate/PhD Students can obtain a 5 CFUs attendance certificate from the University of Pavia.

Course Secretariat

The Course Secretariat is hosted by: Fondazione Alessandro Volta (Contact person: Mr. Francesco Camporini) at Villa del Grumello -Via per Cernobbio, 11 - 22100 Como (Italy). Phone +39 031 579848 - Fax +39 031 573395 Email: francesco.camporini@fondazionealessandrovolta.it **Webpage:**

www.fondazionealessandrovolta.it www.lakecomoschool.org

COURSE webpage:

http://rmst.lakecomoschool.org

Course Instructors:

James L. Barnard, Ph.D., P.E., BCEE., Dist. Fellow IWA - Global Practice & Technology Leader at Black & Veatch, Kansas City (MO), USA. Developer of biological nutrient removal (BNR) processes, specialist in BNR processes and residuals treatment, was awarded the Clarke Prize for Excellence in Water Research (2007), and the Singapore Lee Kuan Yew Water Prize (2011).

Andrea G. Capodaglio, Ph.D., P.E., Fellow IWA – Professor of Environmental Engineering at the University of Pavia (Italy). Member of the International Scientific Board of the AdMaS Joint Research Center, University of Brno (CZ), and of the IWA Steering Committee for Learning Services Development and IWA-Supported Courses. His work has recently been focusing on energy and materials recovery from wastewater and sludge.

Maria Loizidou, Ph.D. – Professor and Head of the Unit of Environmental Science & Technology of the School of Chemical Engineering, National Technical University of Athens. Senior Expert in the field of solid waste and wastewater management with over 35-year experience has been the leader of many international projects on these topics.

Gustaf Olsson, Ph.D., Dist. Fellow IWA - Professor (Emeritus, since 2006) in Industrial Automation, Lund University, Sweden. His research has been focusing on control and automation applied to water systems, recently on the critical issue represented by the water-energy nexus, on which he has published a widely known book, currently at its 2nd edition. Has received the IWA Publication Award (2010), and the IWA Honorary Membership (2012).

David A. Vaccari, Ph.D., P.E., BCEE – Professor, Department of Civil, Environmental and Ocean Engineering at Stevens Institute of Technology, Hoboken, NJ, USA, Board Certified Environmental Engineer. Expert on biological treatment and phosphorus recovery from used water, and on material resource flows in the economy, author of environmental-related textbooks.

Grietje Zeeman, PhD – Professor (Emeritus since October 2016) in 'New Sanitation' at the Department of Environmental Technology, Wageningen University and Research (WUR-ETE). Since 1999 she promoted projects on source-separation based sanitation, aimed at recovery of energy, organics, nutrients and water. As leader of several such projects, she demonstrated that 'New Sanitation', based on separate black and grey water collection, transport and treatment/recovery, is a feasible alternative to conventional sanitation concepts. New sanitation was applied in 2006, for the first time, in a housing estate in Sneek (The Netherlands). The concept is now being implemented in full scale at 5 new locations, including a housing estate of 250 houses, and further projects are currently under development.





FIRST ANNOUNCEMENT

Energy and materials recovery from water & wastes for sustainable urban metabolism: strategies and technologies

SHORT COURSE OFFERED AT THE LAKE COMO SCHOOL OF ADVANCED STUDIES - VILLA DEL GRUMELLO, COMO, ITALY, August 21-25, 2017



Instructors:

Dr. James Barnard, Black and Veatch, Kansas City, USA Prof. Andrea G. Capodaglio, University of Pavia, Italy Prof. Maria Loizidou, National Technical Univ. Athens, Greece Prof. Em. Gustaf Olsson, Lund University, Sweden Prof. David A. Vaccari, Stevens Inst. Of Technology, Hoboken, USA Prof. Em. Grietje Zeeman, Wageningen Univ., The Netherlands

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ALESSANDRO VOLTA





Objective of the Course

This is the second summer course held at the Lake Como School of Advanced Studies dealing with Environmental Sustainability in urban water management. The 2016 course dealt mainly with water-energy new development paradigms, and available technologies. The 2017 course topics have been expanded to include issues related to the treatment of wastewater and urbangenerated wastes in view of the possible and desirable achievement of a truly sustainable urban metabolism compatible with the recently advocated circular economy paradigm.

Some of the best experts around the world have been invited to share their research results and practical experience on these subjects and offer their views on future developments concerning sustainable urban metabolism. Recent/ongoing case studies will be presented to illustrate the concepts exposed. Purpose of the course is to offer attendees state-of-the-art, practical and casevalidated information concerning its focus themes. The course setting and limited attendees' numbers will encourage and foster close interaction among participants in fruitful exchanges of ideas and experiences.

Who should attend?

Water professionals and researchers; engineers and architects involved in urban planning and development; urban water systems and reclamation utilities managers and technical staff; graduate students in environmental engineering and science, urban planning, and ecology.

Course Language: English

Course Location:

Lake Como School of Advanced Studies-Villa del Grumello, in Como, Italy, was established by four major Universities of the area (Como, Insubria, Mi-Bicocca and Pavia), as an international research and knowledge dissemination facility, hosting short-term programmes on a wide range of interdisciplinary subjects, sharing a common focus on complex systems. The L.C.S.A.S. is hosted in the outstanding location of a XVIII-century villa on the shoreline of beautiful Lake Como.

The School attracts every year leading scholars in different fields, engaging in collaborative research and dissemination. In the context of globalization and with the threat of global climate changes, holistic analysis of complex systems offers insights into economic development, social cohesion and the environment.



Course Topics (approximately 32 lecture hours)

- Dr. James BARNARD: State-of-the-art and technological perspectives on Wastewater Treatment and Management. Standard nitrification, denitrification, and phosphorus removal processes with latest developments, effect of BPR on sludge treatment. Impact of MBR technologies on Wastewater Treatment.
- Prof. Andrea G. CAPODAGLIO: Course Introduction and Summary. Technologies for energy recovery from waste streams: Microbial Fuel Cells, Fuel recovery from waste sludge, Integrated Biorefinery concept.
- Prof. Maria LOIZIDOU: State-of-the-art and technological perspectives on Urban Waste Management. Current practices and future trends are discussed with emphasis on the zero waste concept and circular economy. Indicative prospects include the production of useful chemical blocks from biowaste and the production of biofuels (eg. bioethanol) from household food waste.
- Prof. Gustaf OLSSON: The Water-Energy-Food Nexus (interlink between energy, water and food systems) and its implications on industry and society. Illustration, discussion, and consequences on the development of sustainable communities of the importance of water for the energy sector, and of energy as a necessary element of the water cycle (eg. pumping, treatment, distribution and collection of water and wastewater).
- Prof. David A. VACCARI: The Water-Nutrient Nexus Global Cycles of Nitrogen and Phosphorus – Resources and Leaks; Substance Flow Modeling and Resource Conservation; Nutrient Reuse and Recycling; Physicochemical Nutrient Removal and Recovery; Biological Nutrient Removal and Recovery
- Prof. Grietje ZEEMAN: New paradigms for decentralized wastewater treatment with energy recovery. New paradigms for source-separation based recovery of energy, organics, nutrients and water from domestic wastewater streams ('New Sanitation'). Different 'New Sanitation' concepts will be presented, and their application possibilities for different context discussed. Full-scale applications and projects under development will be presented as case studies, next to new technologies for Black water, Grey Water and Urine treatment/recovery and reuse.

(detailed time schedule will follow in the second announcement)

Travel to Villa Grumello

Villa Grumello is walking distance (10-15 min.) from nearby hotels in downtown Como, which is also connected by local buses. Como can be easily reached by regional, highly-frequent trains from Milano and Lugano (Switzerland). Nearest airports are Milano Malpensa, Orio al Serio (Milano-Bergamo) and Milano Linate. Most major and several low-cost airlines serve at least one of these airports daily.



Accommodation

Accommodation can be arranged in advance at discounted prices through the School Secretariat (see online enrollment form). Up to 19 beds (in 1-4 beds rooms) are available onsite in a renovated guesthouse, at the cost of approx.. $30 \notin$ /night, on a first-come basis. Additional accommodation is available in nearby Como in 2*-5* hotels at costs ranging from approx. 40 to 150 \notin /personnight. Additional detailed information available from the secretariat's website.

IT IS ADVISABLE TO CONFIRM ACCOMMODATION REQUESTS AS SOON AS POSSIBLE, GIVEN THE HIGH SEASON PERIOD.

