

NOVEDAR_Consolider

1st SUMMER SCHOOL

“Model -based design, operation and control of WWTP”

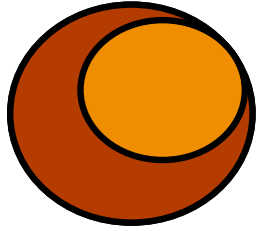
**Organised by CEIT Research Centre with the collaboration of
the School of Engineering of San Sebastian - TECNUN
(University of Navarra)**

14th – 18th of July, 2008

The Summer School “Model-based design, operation and control of WWTP” is aimed at learning and practising the main model-based methodologies for the selection of design and operating parameters in a modern WWTP with carbon and nitrogen removal. For this purpose, the 20 hours of Theoretical Sessions will be focused on presenting the fundamentals of the main processes in the water and sludge lines (activated sludge with nitrification and denitrification, settling and clarification, anaerobic digestion) and the mathematical models commonly used for their dynamic description. The 20 hours of Practical Sessions will be focused on applying the theoretical contents to the design and long-term simulation of an integrated WWTP including water and sludge lines. Based on an appropriate library of unit-process models and computer simulations, the participants in the Summer School will select the dimensions and operating strategy for the main elements of the whole plant and will assess the performance of the different operation and control strategies in a long-term scenario.

The Summer School is suited for Ph-D students interested in modelling tools for Environmental Engineering and professionals from Water Engineering Companies or Water Authorities.

More information: larizkuren@ceit.es

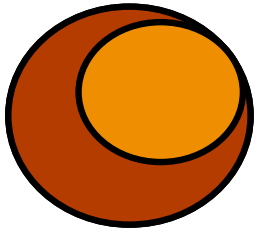


PROGRAM

	Monday	Tuesday	Wednesday	Thursday	Friday
	Water line: Model-based design of the DN process	Water line: Model-based Operation and Control	Sludge line: Design an operation of anaerobic digesters	Model-based optimisation of WWTP	New research lines in WWTP modelling
Theoretical Sessions	<ul style="list-style-type: none"> • Introduction ⁽¹⁾ • Fundamentals on activated sludge for C and N removal ⁽²⁾ • Mathematical modelling of AS reactors (ASM1) ⁽²⁾ • Mathematical modelling of settlers ⁽³⁾ • Model-based design of water line for C and N removal ⁽⁴⁾ 	<ul style="list-style-type: none"> • Analysis of the operating variables in a DN process ⁽¹⁾ • Fundamentals on Automatic Control ⁽⁵⁾ • Description of automatic control strategies for the DN process ^(1, 5) • Description of a Full-scale illustrative example ^(1, 5) 	<ul style="list-style-type: none"> • Fundamentals on anaerobic sludge digesters ⁽⁶⁾ • Mathematical modelling of anaerobic digesters (ADM1) ⁽⁶⁾ • Algebraic solution for the anaerobic digestion model ⁽⁷⁾ • Fundamentals on numerical methods for the integration of dynamic models ⁽¹⁾ 	<ul style="list-style-type: none"> • Fundamentals on mathematical optimisation ⁽¹⁾ • Description of optimisation tools for WWTP design ^(5, 7) • Introduction to integrated WWTP modelling ⁽³⁾ • Plant-Wide-Modelling approaches ⁽³⁾ 	<ul style="list-style-type: none"> • Artificial intelligence techniques for WWTP operation and control ⁽⁸⁾ • Mathematical modelling of costs and technical efficiency in WWTP ⁽⁹⁾ • Uncertainty analysis based on Monte Carlo simulations ⁽¹⁰⁾
Practical Sessions	<ul style="list-style-type: none"> • Introduction to the WEST platform • Description of DN Plant layout (Denitrification – Nitrification) • Simulation study: Model-based design of the DN process 	<ul style="list-style-type: none"> • Introduction to automatic controllers in WEST • Description of DN Plant layout with controllers • Simulation study: Model-based tuning of DN controllers 	<ul style="list-style-type: none"> • Description of ANAD Plant layout • Model-based design of the ANAD Plant layout • Simulation study: performance of anaerobic digesters 	<ul style="list-style-type: none"> • Design and operation of water and sludge lines based on optimisation tools • Optimum design of DN and anaerobic digester • Simulation of the BSM2 Plant layout in WEST 	<ul style="list-style-type: none"> • Selection of operating conditions and tuning of controllers • Short-term and long-term simulation of the water and sludge lines • Roundtable for discussion

(1) Dr. Eduardo Ayesa (CEIT)
 (2) Dr. Luis Sancho (CEIT)
 (3) Dr. Paloma Grau (CEIT)
 (4) Dr. Luis Larrea (CEIT)
 (5) Dr. Ion Irizar (CEIT)

(6) Dr. Jaime L. García-Heras (CEIT)
 (7) Dr. Mónica de Gracia (ATM)
 (8) Dr. Quim Comas (Univ. Girona)
 (9) Dr. Francesc Hernández (Univ. Valencia)
 (10) Ms. Cristina Martín (CEIT)



NOVEDAR_Consolider

Registration: Fill in the attached registration form and send it by e-mail to larizkuren@ceit.es, no later than **8 July 2008**. Applicants to grants have to send the registration form together with their CV before **1 July 2008**.

Registration fees:

500 € for students
2000 € for companies

It will cover course material, coffees, lunches and the farewell dinner. These fees have to be paid no later than **8 July 2008** by bank transfer to:

Recipient: Leire Arizkuren
Account holder: CEIT
Bank name: Caja Gipuzkoa San Sebastian
Bank address: C/ Guetaria 9-11. 2005 San Sebastian
Iban: ES73 2101 0206 1400 0326 9628
Swift/Bic: CGGKES22

Grants: To types of grants are offered to students covering: A) Registration and B) Registration + Accommodation (from Sunday 13th to Thursday 17th of July, in double rooms of Colegio Mayor Olarain).

Participants awarded with a grant will be notified by e-mail as soon as possible and no later than 3 July.

Suggested Accomodation:

- Colegio Mayor Olarain: <http://www.olarain.com/>

Single rooms available at 52.25 €/night

Indicate that you call on behalf of the Summer School Consolider when making the reservation of the room.

- Hotel Codina: <http://www.hotelcodina.es/>
- Hotel Esperia: <http://www.hesperia.es/hoteles/Hesperia-Donosti/>

Except for grant holders, you have to make the hotel reservation by yourself. Please take into account that San Sebastian is a very popular city for tourists in July, thus make the hotel reservation as soon as possible.