



Universidad Autónoma de San Luis Potosí
Facultad de Ingeniería, CIEP
Grupo Proaqua SA de CV (Grupo Marhnos)

Professional Training Course
Microbiology of Activated Sludge.
Identification and Solving of Bulking,
Foaming and other Activated Sludge
Process Disfunctions

San Luis Potosí, S.L.P.,
12 y 13 de
septiembre de 2005

Curso impartido en inglés por:
Dr. CHRISTIAN DRAKIDÈS
del Centre National de la Recherche
Scientifique, Francia CNRS, UMR 5569
Hydrosciences - Maison des Sciences de
l'Eau de Montpellier

INFORMES E INSCRIPCIÓN

Centro de Investigación y Estudios de Posgrado
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Inscripciones del 18 de agosto al
10 de septiembre
Cupo limitado.

PRECIO DEL CURSO

\$ 1,500 M.N,

La inscripción incluye material didáctico
impreso, reconocimiento y servicio de
cafetería.

LUGAR

Centro de Investigación y Estudios de Posgrado,
Edificio P de la Facultad de Ingeniería (UASLP).
Salón P-21

PROGRAMA

12 de septiembre 2005

08:30 h. Registro de participantes.
Entrega de documentación
09:00-14:00 h. Curso
16:00-18:00 h. Curso

13 de septiembre 2005

09:00-13:30 h. Curso
15:30-17:30 h. Curso

COMITÉ ORGANIZADOR DEL CURSO

Dra. María Guadalupe Barajas López, Dra. en
Ciencias Biológicas. Profesora Investigadora del
CIEP-FI (UASLP).

Dr. Antoni Escalas Cañellas, Dr. Ingeniero
Industrial. Profesor Investigador del CIEP-FI
(UASLP).

Dr. Juan Pedro Escobar Latapí, Dr. en Ingeniería
Química. Director General de Grupo Proaqua S.A. de
C.V. (Grupo Marhnos).

1945 - 2005



Aniversario

Facultad de
Ingeniería

*"60 años de esfuerzo
permanente"*

COURSE TITLE:

Microbiology of Activated Sludge. Identification and Solving of Bulking, Foaming and other Activated Sludge Process Disfunctions.

COURSE INTENDED FOR:

- Wastewater treatment plant engineers
- Wastewater treatment plant laboratory biologists and chemists
- Consulting firms
- University researchers and students interested in biological wastewater treatment

SCOPE AND METHODS:

Intensive biological wastewaters treatment processes herein referenced as wastewater biological treatment plants (WWBTs) are mainly activated sludge and derivatives, sequencing biological reactors, biological filters, trickling filters and rotating biological contactors.

The training course includes both lectures and demonstrations. Lectures are based upon paper supports (text, drawings, photos) and numeric support (PPT presentations). Demonstrations will be made live with a microscope equipped with video image capture connected to a screen presentation, giving the possibility to trainees to bring with them samples of activated sludges from their own plants. Those samples may be very small (i.e. 50 ml), but must be representative of the mixed liquor in the aeration tank during the aeration period, and recent (no more than 48 hours, if possible kept at 4 °C)

CONTENTS:

1- Ecological background: the links between biology, physical-chemical parameters and chemical engineering:

1-1- Relevant parameters for adaptation of living organisms to WWBT processes. Influence of physical-chemical parameters on wastewater treatment biology. Adaptive capabilities of microbial ecosystems.

Applications:

- *Examples of bacterial responses to environment variations in WWBT*
- *Lag-time responses to externally induced perturbations in WWBTs. Identification of causes.*

1-2- Main WWBTs bacteria and communities.

Ecosystems diversity and competition, influence of treatment processes and wastewater origin. Biofilm growth conditions and composition of exocellular polysaccharids. Influence upon flocculation and cationic retention. Applications.

1-3- Chemical engineering approach for WWBTs.

Main theoretical and real hydraulic configurations, parameters and kinetics characterization. Applications.

2- Filamentous microorganisms, bulking and scum production:

2-1- Filamentous growth impact on liquid - solid separation and water clarification. Bulking description and characterisation, scums classification and identification.

2-2- General characteristics of filamentous growth. Competition with flocculated bacteria and CHUDoba hypothesis.

Application: Critical analysis of wastewater treatment processes parameters (bio and chemical parameters, hydraulic configuration and sludge treatment line interferences) causative of filamentous growth.

2-3- A classical case of filamentous bulking: Sphaerotilus. Main physiological, biochemical and ecological characteristics.

Application: Risk assessment for agro-industrial WWTPs.

2-4- The main groups of filamentous microorganisms and their case occurrences (the scums-, the sulfo-oxidizing- and the lightweight carbon compounds- organisms). Critical use of EIKELBOOM identification key and simplification.

Application: Preventive and curative control means and procedures. Case studies

3- Wastewater treatment microfauna:

3-1- General characteristics and role

3-2- Microfauna adaptive strategies, links with a systematic traditionally based upon buccal and locomotive systems.

Application: use of an optical microscopic microfauna examination combined with the DRAKIDES identification manual utilisation for fast diagnostic of W.W.B.T.Ps.

4-Synthesis: examples of WWBTs ecosystems and their relations with the effluents, sewer system, plant conception and operating characteristics.