

SANDRA IMACULADA MAINTINGUER

(Researcher from IPBEN – Central Laboratory – Rio Claro)

## **B1006 – Tópicos Avançados em Biorefinarias**

**Subject: Biologic Processes applied in Bioenergy**

Level: Doctor's degree

Compulsory subject: No

Class load: 40

Credits: 4

Summary: Fundamentals of microbiology and anaerobic biotechnology processes applied on bioenergy from wastes. Monitoring and identification of the microorganisms involved in energy generation. Techniques of isolation and cultivation of microorganisms applied on wastewaters. Approaches of the Biological processes for waste conversion to bioproducts, mainly biogas, organic acids, alcohols, among others. Recent advances in the development of the anaerobic bioreactors, mainly the ideal configurations of them applied on bioenergy generation.

Evaluation: Presentation of individual seminars; written test; Exercises in the classroom

Bibliography:

Latest articles of international scientific literature on biologic processes for bioenergy.

### **Books:**

1. Samir, K.K. Anaerobic Biotechnology for Bioenergy Production: Principles and Applications, Wiley-Blackwell, 2008, 320p.
2. Speece, R.E. Anaerobic Biotechnology for Industrial Wastewaters. Archae Press, Nashville, Tennessee, 1996
3. Chernicharo, C.A. Princípios do Tratamento Biológico de Águas Residuárias: Reatores anaeróbios. Editora: Universidade Federal de Minas Gerais, v. 5, 1997, 246p.
4. Sant'Anna Jr, G. L. Tratamento Biológico de Efluentes: Fundamentos e Aplicações. Editora Interciência, Rio de Janeiro, 2010, 398p.
5. Bacterial Metabolism – G. Gottschalk. Springer-Verlag, 1988.
6. Biology of Anaerobic Microorganisms – A. J. B. Zehnder. John Wiley and Sons Inc., Publications, 1988.
7. Madigan, M.T.; Martinko; J.M.; Dunlap, P. V.; Clark, D. P. Microbiologia de Brock, 12 ed, Artmed, 2010, 1160p.

8. Microbiologia. Conceitos e Aplicações. Pelczar, M.J.Jr; Chan, E.C.S e Krieg, N.R.. Vol I e Vol.II. 2a. ed./ MAKRON Books Ed. Ltda., 1996.
9. Principles of Microbiology. R. M. Atlas.WCB Publishers. Second Edition. 1996.
10. Wastewater Microbiology – G. Bitton. Willey-Liss (John Wiley and Sons Inc., Publications), 1994.
11. Rittmann B.E., Mc Carty – Environmental Biotechnology: Principles and Applications. Mc Graw Hill. NY. 2001. 756 pp.
12. F. Cervantes (2006). Advanced Biological treatment processes for industrial wastewaters. IWA publishing, London 345 pp.
13. Gerardi, M.H. (2006). Wastewater bacteria. New Jersey. 255 pp.