



Universidade Federal de Santa Catarina  
Centro Tecnológico  
Departamento de Engenharia Química e  
Engenharia de Alimentos



## Programa de Pós-Graduação em Engenharia Química

### PLANO DE ENSINO TRIMESTRE 2022.3

#### I. COURSE IDENTIFICATION

CODE	Dicipline Name	Credits	Period
ENQ3253000	Biological Waste Treatment	45	Tuesday 8:20 a 11:50

#### II. Lecturer TEACHER

Hugo Moreira Soares

#### III. TUTOR

N/A

#### IV. PRESENCE IN SYNCHRONOUS ACTIVITIES

Presential

#### V. COURSE AND TARGET AUDIENCE

Master and Doctorate in Chemical Engineering

#### VI. MENU

Fundamental concepts on microbiology, biochemistry and thermodynamics. Aerobic and anaerobic treatment systems. Nutrients removal. Landfilling, composting and leaching. Upstream and downstream processes.

#### VII. OBJECTIVES

Establishment of suitable path to treat solid and liquid wastes.

#### VIII. PROGRAM CONTENT

Waste characterization, microbiology, biochemistry and thermodynamics; Aerobic and anaerobic treatment; Nutrients removal; Solid waste treatment.

## IX. TEACHING METHODOLOGY

The classes will all be taught in classroom lessons and some synchronously activities (via Moodle, in an exclusive environment), using slide exhibition materials and various video materials available on the internet.

All course material, including class presentation slides, class recordings, programmed exercises with their respective templates will be made available in the Moodle environment.

## X. EVALUATION METODOLOGY

The evaluation will be by 1 presentation at the end of the course.

## XI. SCHEDULE

20/09/2022 Class 1 Introduction

27/09/2022 Class 2 Characterization

04/10/2022 Class 3 Fundamental concepts on microbiology, biochemistry and thermodynamics 1

11/10/2022 Class 4 Fundamental concepts on microbiology, biochemistry and thermodynamics 2

18/10/2022 Class 5 Aerobic Treatment Process

25/10/2022 Class 6 Anaerobic Treatment Process

01/11/2022 Class 7 Nutrients removal

15/11/2022 Holiday: No Class

22/11/2022 Class 8 Solid waste treatment

29/12/2022 Class 9 Advanced Treatment Systems

06/12/2022 Class 10 EVALUATION ACTIVITY

## XII. REFERENCES

SOARES, H. M. (2007). **Tratamento de Efluentes**. Apostila do Curso de Graduação em Engenharia Química e em Engenharia de Alimentos

Weblinks disponibilizados via Moodle.

Consulta de livros online na BU/UFSC: <http://portal.bu.ufsc.br/a-biblioteca-universitaria-da-ufsc-oferece-acesso-a-livros-eletronicos-em-diversas-areas-do-conhecimento/>

### COMPLEMENTARY REFERENCES

SCHMIDELL, W.; SOARES, H.M.; ETCHEBEHERE, C.; MENES, R.J.; BERTOLA, N.C.; CONTRERAS, E.M. (2007). **Tratamento Biológico de Águas Residuárias**. Ed. Tribo da Ilha.

METCALF & EDDY, INC. (1991). **Wastewater Engineering**. 3<sup>rd</sup> Edition, Mc Graw Hill.

GRADY, C. P. L. & LIM, H. C. (1981). **Biological Wastewater Treatment, Theory and Applications**.

CHERNINCHARO, C. A. L. (1997). **Princípios de Tratamento Biológico de Águas Residuárias**. UFMG.

SPERLING, von S. (1997). **Princípios de Tratamento Biológico de Resíduos: Lodos Ativados**. Departamento de Engenharia Sanitária e Ambiental da UFMG.

SPEECE, R. E. (1996). **Anaerobic Biotechnology**. Archae Press.

VAN HAANDEL, A. & LETTINGA, G. (1994). **Tratamento Anaeróbio de Esgotos**. Livraria Independente (L-0-471-95121-B).

HAUG, R. T. (1993). **The Practical Handbook of Composting Engineering**. Lewis Publishers.