ESIROI
ÉCOLE D'INGÉNIEURS
UNIVERSITÉ DE LA RÉUNION

DEPARTMENT : *BE*
SEMESTER : *S9*

IDENTIFICATION

Course code :	E5BE9ER2
ECTS :	2.5

DURATION

Lectures :	6
Tutorial classes :	18
Labs :	8
Total :	32

Project :
Personnal work :

ASSESSMENT

Lab Report

TEACHING MATERIALS

Handout and PowerPoint Presentation

LANGUAGE

English

CONTACT

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Modifié le : 3 août 2026

UE : Énergies

COURSE : Waste Management and Valorization (2 lab sessions)

SCOPE OF THE COURSE

OBJECTIVES

The objective is to understand the operation of treatment and recovery systems for biomass-type waste.

COMPETENCE AND SKILLS

Mastery of the scientific, technical, and environmental aspects related to systems for processing and valorizing biomass-type waste.

PROGRAM

Nature of biomass ● Biomass typology ● Biomass characterization ● Biomass structure

Biomass treatment processes ● Physicochemical treatment (Coagulation, flocculation, decantation) ● Biological treatment (carbon, nitrogen and phosphorus treatment) ● Reverse osmosis

Biomass energy recovery processes ● Biochemical processes : ○ Aerobic and anaerobic digestion : processes and sizing ○ Fermentation : processes and sizing ● Thermochemical processes ○ Combustion / incineration : processes and sizing ○ Gasification : processes and sizing ○ Pyrolysis

BIBLIOGRAPHY

R. Moletta, 2008, Anaerobic digestion, Edition Lavoisier, pp532 OTV, Traiter et valoriser les boues, ISBN 2-9511059-0-8, 2001. Biomass gasification and pyrolysis : practical design and theory / Prabir Basu. ISBN 978-0-12-374988-8, 2010

REQUIREMENTS

Notions of Chemistry and Biochemistry