

 UNIVERSIDADE FEDERAL DE SANTA CATARINA	UNIVERSIDADE FEDERAL DE SANTA CATARINA CENTRO TECNOLÓGICO (CTC) Departamento de Engenharia Química e Engenharia de Alimentos (EQA) Programa de Pós-Graduação em Engenharia Química (POSENQ)		
	PLANO DE ENSINO		
	TRIMESTRE 2025.2 – AULA PRESENCIAL		

I. IDENTIFICAÇÃO DA DISCIPLINA			
Código	Nome da disciplina	Créditos	Período
EMC410242	Introduction to Sustainable Materials	3	2025/2

II. PROFESSOR MINISTRANTE
Dachamir Hotza

III. TUTOR
N/A

IV. CURSO E PÚBLICO-ALVO
Mestrado/Doutorado em Ciência e Engenharia de Materiais, Extensivo a Mestrado/Doutorado em Engenharia Química e cursos afins

V. EMENTA
INTRODUCTION TO SUSTAINABILITY AND MATERIALS. ENVIRONMENTAL IMPACT OF MATERIALS. RENEWABLE AND BIODEGRADABLE MATERIALS. RECYCLING AND CIRCULAR ECONOMY. INNOVATION AND FUTURE TRENDS. CASE STUDIES AND PRESENTATIONS.

VI. OBJETIVOS
Enable students in engineering and materials-related programs to understand the principles, challenges, and innovations in the development, application, and evaluation of sustainable materials. The course aims to provide a foundational understanding of sustainability concepts in materials science, environmental and social impacts of materials, and strategies such as recycling, circular economy, and green design.

VII. CONTEÚDO PROGRAMÁTICO
INTRODUCTION TO SUSTAINABILITY AND MATERIALS. Basic concepts, classification, and design principles of sustainable materials. ENVIRONMENTAL IMPACT OF MATERIALS. Assessment of environmental effects through life cycle analysis. RENEWABLE AND BIODEGRADABLE MATERIALS. Sources, properties, and applications of eco-friendly materials. RECYCLING AND CIRCULAR ECONOMY. Strategies for reuse, recycling, and circular product systems. SUSTAINABLE MATERIALS IN MANUFACTURING. Use of sustainable materials in industrial production. INNOVATION AND FUTURE TRENDS. New technologies and directions in sustainable materials research. CASE STUDIES AND PRESENTATIONS. Group analysis and discussion of real-world applications.

VIII. METODOLOGIA DE ENSINO / FORMA DE TRABALHO

Atividades presenciais em sala dedicada de computadores individuais ou em dupla

- 8:20-10:00 resolução de exercícios
- 10:00-10:10 intervalo
- 10:10-11:50 exposição de novo tema
- Uso de software específico (GRANTA EDUPACK – ECOAUDIT)

Atividades assíncronas (via Moodle, em ambiente exclusivo)

- Lista de exercícios
- Videoaulas
- Textos
- Links

IX. METODOLOGIA DE AVALIAÇÃO

- Questionários (execução assíncrona e individual; correção síncrona e coletiva) – 50%
- Projetos (apresentação em duplas) – 50%

Esta disciplina NÃO possui Exame Antecipado de Avaliação.

X. CRONOGRAMA

Programação (3as. feiras, 8:20-11:50, com intervalo)

1. INTRODUCTION TO SUSTAINABILITY AND MATERIALS.
2. ENVIRONMENTAL IMPACT OF MATERIALS.
3. RENEWABLE AND BIODEGRADABLE MATERIALS.
4. RECYCLING AND CIRCULAR ECONOMY.
5. SUSTAINABLE MATERIALS IN MANUFACTURING.
6. INNOVATION AND FUTURE TRENDS.
7. CASE STUDIES AND PRESENTATIONS.

XI. BIBLIOGRAFIA

- ASHBY, M. F. Materials and the Environment: Eco-informed Material Choice. 3rd ed. Oxford: Butterworth-Heinemann, 2021.
- ASHBY, M. F.; SHAHINPOOR, M. Introduction to Materials for Sustainable Development. Cambridge: Cambridge University Press, 2023.
- ASHBY, M. F.; JOHNSON, K. Materials and Design: The Art and Science of Material Selection in Product Design. 4th ed. Butterworth-Heinemann, 2019.
- LABRINCHA, J.A.; NOVAIS, R.M.; HOTZA, D. Materiais e Sustentabilidade. Engebook, 2024.