

Material Flows and Water Cycle

Code: 106925 ECTS Credits: 6

Degree	Туре	Year	Semester
2503743 Management of Smart and Sustainable Cities	FB	1	1

Contact

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Teaching groups languages

You can check it through this <u>link</u>. To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

Teachers

Carles Gasol Martinez

Prerequisites

Enrolled students must have sufficient knowledge to be able to solve equations without difficulties, among other t

Objectives and Contextualisation

The subject will allow enrolled students to know and deepen the main causes and consequences of the global and

Learning Outcomes

- KM05 (Knowledge) Describe mathematical models of electronic systems and flows of electricity and matter.
- SM05 (Skill) Develop material and energy balances in steady and dynamic states.

Content

2023/2024

Previous concepts: change of units between the different systems of units. Principle of conservation of matter and energy.

Macroscopic balance of matter. Terms of the balance equation. Balance of total matter. Steady state. Material balance applied to a component. Systems with recirculation, purging and derivation (bypass). The generation term. .

Environmental impacts. Matter cycles, pollution and impacts of human activity. Linear model and cyclic model; circular economy.

Urban water cycle. Consumption and waste water. Treatment and reuse systems.

Air pollution and types of pollutants. Air pollution control. the atmosphere Sources of pollutants. Air quality.

Methodology

Theoretical lessons: master classes on the concepts of the syllabus, with the participation and intervention of the students.

Problem solving classes and case studies: solving problems corresponding to the subject by the students. Discussion on solution strategies, their analysis and their execution.

The course has a Moodle classroom, within the UAB Virtual Campus platform, where the contents are found weekly, as well as the presentations (after their completion in the classroom), and statements of the exercises, as well as material complementary and suggested activities.

Elaboration of assignments and reports: case studies that will be raised and solved by the students individually or in groups, from which they will make a report (written and/or multimedia). The work will be done in supervised groups, and autonomously in groups and individually.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Problems, case studies, and reports	24	0.96	KM05, SM05, KM05
Theoretical classes: lectures	26	1.04	KM05, SM05, KM05
Type: Supervised			
Tutorials	12	0.48	KM05, SM05, KM05
Type: Autonomous			
Aprenentatge autònom	30	1.2	KM05, SM05, KM05
Aprenentatge col.laboratiu: elaboració de treballs i informes	48	1.92	KM05, SM05, KM05

Assessment

The contents of the subject will be assessed through two partial exams and two assignments. To pass the subject you will need to get a 5 as a weighted overall grade, and a 3 out of 10 for each assessment activity to be able to do the average. Non-participation in any of the specific activities will be assessed with a zero taht activity.

There will be a final exam to evaluate the assessment activities with a rating of less than 5 out of 10. To be able to participate in the make-up you must have obtained a minimum previous grade of 2.75 out 10.

Copying, allowing copying or plagiarism (or the attempt to) in any of the assessment activities is equivalent to a Failure.

Exams will be reviewed exclusively on the date and time announced for each exam.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
First exam	35	3	0.12	SM05
First work and report	15	2	0.08	KM05
Second exam	35	3	0.12	KM05
Second work and report	15	2	0.08	SM05

Bibliography

Master, G. M. (2008). Introducción a la ingeniería medioambiental (3era ed.)

Software

Data sheet