

Valid for 2023.HS

<b>Module Name: Material and Energy Systems</b>	
Module Code	w.MA.XX.MES.23HS
Module Description	Sustainability is the practice of using natural resources, such as water, soil, or air responsibly so that they can support both present and future generations. The module "Material and Energy Systems" focuses on understanding material and energy flows in natural and man-made systems as a conceptual model for the circular economy. Principles and types of natural ecosystems, the interaction of biotic communities and abiotic factors, and the influence of human uses are discussed. Energy and material flows in the continuum between pioneer and mature natural and anthropogenic ecosystems are examined and compared with engineered technical solutions such as agricultural, solid waste management, water, and wastewater systems.
Program and Specialization	Circular Economy Management
Legal Framework	Academic Regulations MSc in Circular Economy Management dated 02.06.2022, Appendix to the Academic Regulations for the degree program in Circular Economy Management, first adopted on 23.09.2022
Module Category	<b>Module Type:</b> Compulsory
ECTS	3
Organizational Unit	W Center for Corporate Responsibility CCR
Module Coordinator	Dirk Steuerwald (stuw)
Deputy Module Coordinator	Daniel Matthias Meier (meid)
Prerequisite Knowledge	-
Contribution to Program Learning Goals (Affected by Module)	§ Professional Competence § Methodological Competence § Social Competence § Self-Competence
Contribution to Program Learning Objectives	Professional Competence § Knowing and Understanding Content of Theoretical and Practical Relevance § Apply, Analyze, and Synthesize Content of Theoretical and Practical Relevance § Evaluate Content of Theoretical and Practical Relevance Methodological Competence § Problem-Solving & Critical Thinking § Scientific Methodology § Work Methods, Techniques, and Procedures § Information Literacy § Creativity & Innovation Social Competence § Written Communication § Oral Communication § Teamwork & Conflict Management § Intercultural Insight & Ability to Change Perspective Self-Competence § Self-Management & Self-Reflection § Ethical & Social Responsibility § Learning & Change
Module Learning Objectives	Students... § Analyze, compare, and explain material and energy flows in ecological systems using simple examples. § Recognize and explain the connection between biodiversity and the intensity of material and energy flows, e.g., based on agriculture. § Assess the influence of human uses on material and energy flows of selected ecosystems. § Recognize the influence of one's own actions, for example, as a circular economy manager, on the material and energy flows of ecosystems and formulate options for action.
Module Content	§ Material cycles and energy flows in ecological systems. § Typification of ecosystems ("pioneer" ecosystems to "mature" ecosystems) and transferability to CE systems. § Ecosystems and biodiversity. § Ecosystem services in the agricultural transformation
Links to other modules	The content of this module is linked to the following modules: w.MA.XX.BIMA.23HS

	w.MA.XX.LCSA.23HS		
	w.MA.XX.SSEC.23HS		
Methods of Instruction	§ Lecture § Interactive Instruction § Exercises § Explorative Learning § Literature Review	<b>Social Settings Used:</b> Group Work	
Digital Resources	§ Reader § Teaching Materials		
Type of Instruction	<b>Classroom Instruction</b>	<b>Guided Self-Study</b>	<b>Autonomous Self-Study</b>
Lecture	23 h	-	
Excercise	5 h	17 h	
Project Work	-	-	
Seminar	-	-	
<b>Total</b>	<b>28 h</b>	<b>17 h</b>	
Performance Assessment			
<b>End-of-module exam</b>	<b>Form</b>	<b>Length (min.)</b>	<b>Weighting</b>
-	-	-	-
<b>Permitted Resources</b>	-		
<b>Others</b>			
	<b>Assessment</b>	<b>Length (min.)</b>	<b>Weighting</b>
Written Assignment	Pass/Fail	-	-
Written Assignment	Pass/Fail	-	-
Written Assignment	Pass/Fail	-	-
Written Assignment	Pass/Fail	-	-
Students are not allowed to revise and resubmit performance assessment tasks.			
Classroom Attendance Requirement	Mandatory Attendance: 75%		
Language of Instruction/Examination	English		
Compulsory Reading	-		
Recommended Reading	-		
Comments	-		