

COURSE: SYSTEMS THINKING INTRODUCTION
AUTHOR: UOM
THEME: KEEP RELEVANT THEMES: RENEWABLE ENERGY, SUSTAINABLE HOUSING , SUSTAINABLE FOOD SYSTEM, CIRCULAR ECONOMY
MODULE: 4
SESSION:1
LECTURE TOPICS: 1. INTRODUCTION TO POLICY MODELING 2. WHAT IS A MODEL 3. WHY POLICIES AND POLICY MODELS OFTEN FAIL 4. SYSTEMS THINKING AND SYSTEM DYNAMICS 5. CAUSAL LOOP DIAGRAMS 6. CASE STUDY: SUSTAINABLE HOUSING
TARGET GROUP: END-USERS OF THE PROJECT (HE STUDENTS)
INTEGRATION INTO CURRICULUM: integration into the school/university curriculum, connection to other disciplines and subjects if applicable
LEARNING OUTCOMES: maximum 5 learning outcomes based on Bloom’s Taxonomy in terms of students’ knowledge, comprehension, application, analysis, synthesis. <ul style="list-style-type: none"> - Knowledge: To explain the main ideas of policy modeling and policy design and introduce the methodology of System Dynamics - Comprehension: To understand how to represent the elements and relations of a system in a Causal Loop Diagram - Application: To apply the gained knowledge in the development of a Causal Loop Diagram about Sustainable Housing - Analysis: To understand the behavior of the Sustainable Housing system in time - Synthesis: To transform the insights from the Causal Loop Diagram into potential policies (policy design)
LECTURE OBJECTIVES: <ol style="list-style-type: none"> 1. LEARN TO UNDERSTAND WHAT IS SIMULATION, HOW IT CAN ASSIST AND WHAT IT CANNOT ACHIEVE 2. UNDERSTAND THE THEORETICAL ASPECTS OF THE SIMULATION METHODOLOGY TO BE USED: SYSTEMS, RELATIONSHIPS, CAUSAL LOOP DIAGRAMS 3. APPLY THE KNOWLEDGE IN THE DEVELOPMENT OF A CAUSAL LOOP DIAGRAM ABOUT SUSTAINABLE HOUSING 4. INVESTIGATE THE BEHAVIOR OF THE SYSTEM AND GAIN INSIGHTS INTO THE EFFECTS OF POTENTIAL POLICIES
LECTURE DURATION: 60 MIN
GREEN SKILLS ADDRESSED: (KEEP RELEVANT ONES FROM THE LIST) DESIGN SKILLS, LEADERSHIP SKILLS, MANAGEMENT SKILLS , CITY PLANNING SKILLS , LANDSCAPING SKILLS , ENERGY SKILLS, FINANCIAL SKILLS, PROCUREMENT SKILLS, WASTE MANAGEMENT SKILLS, COMMUNICATION SKILLS
SDGS ADDRESSED: GOAL 9, GOAL 11
LECTURE DEVELOPMENT
BEFORE: preparation prior to the lesson
LECTURES IN PPT FILES, A DOCUMENT CONTAINING ALL THE MATERIAL FOR THE LECTURE, MULTIPLE CHOICE QUESTIONS TO ASSESS THE LEVEL OF UNDERSTANDING



INTRO: ideas for activating the student’s background knowledge or ice breaker
(CO-CREATION ACTIVITY)INTRODUCTION WITH A DESCRIPTION OF THE FISH BANKS GAME, ITS CONTEXT AND ITS RAMIFICATIONS (FOR MORE INFORMATION PLEASE REFER TO: [HTTPS://MITSLOAN.MIT.EDU/TEACHING-RESOURCES-LIBRARY/FISHBANKS-A-RENEWABLE-RESOURCE-MANAGEMENT-SIMULATION](https://mitsloan.mit.edu/teaching-resources-library/fishbanks-a-renewable-resource-management-simulation))

DURING:

TIME	TYPE OF ACTIVITY	LEARNING ACTIVITIES	(VISUAL) AIDS
10 MINUTES	INTRODUCTION TO THE POLICY CYCLE AND POLICY MODELING	PRESENTATION ON THE STEPS OF THE POLICY CYCLE. PRESENTATION ON MODELING FOR POLICY: WHAT IS A MODEL, HOW IT CAN HELP, WHERE IT CAN LEAD TO MISTAKES	PPT FILES
10 MINUTES	SYSTEMS THINKING AND SYSTEM DYNAMICS	PRESENTATION OF: 1) SYSTEMS THINKING AND SYSTEM DYNAMICS. 2) WHAT IS A SYSTEM	PPT FILES
20 MINUTES	CAUSAL LOOP DIAGRAMS	PRESENTATION OF: 1) POSITIVE AND NEGATIVE CAUSAL RELATIONSHIP 2) FEEDBACK LOOPS AND POTENTIAL BEHAVIOR 3) APPLICATION OF BASIC FEEDBACK LOOPS IN REAL-LIFE EXAMPLES: A) ARMS RACE B) FIRES AND GLOBAL TEMPERATURE	PPT FILES
15 MINUTES	SUSTAINABLE HOUSING	PRESENTATION OF: 1) GENERAL INFORMATION ON SUSTAINABLE HOUSING 2) IMPORTANT	PPT FILES, CO-CREATION ACTIVITY



		<p>ELEMENTS IN THE SYSTEM OF SUSTAINABLE HOUSING</p> <p>3) DEVELOPMENT OF CAUSAL LOOP DIAGRAM OF SYSTEM (CO-CREATION ACTIVITY FOR STUDENTS)</p>	
5 MINUTES	DISCUSSION OF THE RESULTS	DISCUSSION WITH THE STUDENTS ABOUT THE POTENTIAL BEHAVIOR OF THE SYSTEM AND POLICY DESIGN	PPT FILE, CO-CREATION ACTIVITY
<p>BEYOND:</p> <p>Homework: Multiple Choice Questions,</p> <p>Assessment: 100% MCQ</p> <p>Recommended additional materials: Papers, free textbook, case studies, the ppt files will be provided.</p>			