

Roger Williams University Example Semester Outline: SUST 301- Analysis & Decision Making for Sust.

Class session number	Topics/Activities	Learning Objectives
1	Introduction to course	<ul style="list-style-type: none"> • List the major course objectives • Describe on a rudimentary level the major course work to be completed during the semester
2	Analysis vs Decision Making	<ul style="list-style-type: none"> • Define the term Analysis as it relates to sustainability • Define the term Decision as it relates to sustainability • Explain the reason why the decision should come after analysis
3	Measurement	<ul style="list-style-type: none"> • Measure instantaneous power use with a Kill-o-watt • Measure total energy use with a kill-o-watt • Compute total energy used from duration of service and power draw • Discuss the importance of the "Power Factor" • Interpret measurements made with a kill-o-watt
4	Impact Categories	<ul style="list-style-type: none"> • Describe the necessary first step to making a decision – enumerate the guiding principles or rules • List and explain important objectives to consider to make decisions that result in greater sustainability • Explain the general characteristics of processes that lead to decisions
5	Carbon Footprint Calculation	<ul style="list-style-type: none"> • Define what is meant by "carbon foot print" • List processes which contribute to carbon foot prints • Recognize that different fossil fuels have different CO2 emission rates • Recognize that fossil fuels have different "heating values" • Calculate a carbon footprint of a process which burns fossil fuels • Describe other (non-fossil fuel combustion) components to carbon footprints • Examples of how results are used
6	Introduction to Campus Carbon Calculator	<ul style="list-style-type: none"> • Explain the basic layout of the calculator • Describe the use of the calculator • Understand selected entries in the calculator
7	Tour of a Campus Building	<ul style="list-style-type: none"> • Recognize devices in the Commons that use the major amount of electricity in the building • Recognize the devices in the Commons that use Natural Gas • Recognize devices in the Commons that use Refrigerant • Recognize the system that handles wastewater in the Commons
8	CCC: Green-house gas Accounting Concepts	<ul style="list-style-type: none"> • Know which portion of the CCC you are responsible for • Define the terms: organizational boundary, operational boundary, temporal boundary, Offsets, Scopes 1, 2 and 3 emissions
9	CCC: Inventory Module - I	<ul style="list-style-type: none"> • Describe best practices in collecting data for the CCC • Understand the requirements of the CCC project
10	RWU CF Work time	
11	CCC: Summary Module	<ul style="list-style-type: none"> • Define CO2 equivalent emission • Describe how the CCC presents summarizes information • Extract plots and summary data from the CCC • Discuss what "normalized" results are

12	CCC: Projection Module	<ul style="list-style-type: none"> • Describe the types of projection available in the CCC • Use linear projection to predict a future value of a quantity • Explain in a general sense how the CCC carries out linear projection
13	CCC: Solutions Module	TBD
14	Review for Exam I	
15	Exam I	
16	Guest Lecture: how we make decisions	<ul style="list-style-type: none"> • Define Automatic cognition • Define Controlled cognition • Describe the process used when making decisions • Discuss the idea of "optimal number of choices"
18	Engineering Decisions	<ul style="list-style-type: none"> • Describe the terms Technical Analysis, Cost-Effectiveness Analysis • Perform a simple Technical Analysis
19	Cost/Benefit Analysis	<ul style="list-style-type: none"> • Describe the term Cost/Benefit Analysis • Discuss the scope and limitations of B/C analysis • Become familiar with the terms annual cost, present worth and sunk costs
20	LCA - I	<ul style="list-style-type: none"> • Define LCA • Discuss the differences between three different types of LCA: Comprehensive, Streamlined, and EIO-LCA • Describe the various standards that exist for completing LCA's • Understand the requirements of the LCA Case Study Project.
21	Risk Assessment	<ul style="list-style-type: none"> • Recognize the modes of intake of chemicals into the body • Calculate the quantities such as CDI • Characterize risk from known CDI's
22	Decision Trees	<ul style="list-style-type: none"> • Describe the conditions under which it is useful to use a Decision Tree • Read a decision Tree • Define and Calculate the expected value of a decision
23	AHP - I	<ul style="list-style-type: none"> • Define AHP • Recognize when it is useful to use AHP • Describe an example of when AHP was used to make a decision
24	AHP - II	<ul style="list-style-type: none"> • Describe in detail the AHP application to a case study (the one presented in class)
25	LCA - II	Recognize some of the steps on an LCA as portrayed in "Addicted to Plastic"
26	LCA - III	<ul style="list-style-type: none"> • Cite specific examples from "Addicted to Plastic" which describe aspects of Scope, LCI, Impact Assessment, and interpretation • Understand the utility of a flow diagram in LCA • Draw a basic flow diagram for a process • Define functional unit in the context of LCA • Select or be aware of the complexities involved in selecting a functional unit for an LCA • Define "LCA" Specificity • Define Scope • Recognize and critique the scope and goal phase in an LCA study
27	Review for Exam II	
28	Exam II	

29	LCA IV	<ul style="list-style-type: none"> • Define LCI • List and describe the key steps in the LCI phase of an LCA • Draw a general system diagram complete with inputs and outputs • Identify inputs and outputs • Recognize and critique the LCI phase in an LCA study
30	LCA V	<ul style="list-style-type: none"> • Define Life Cycle Impact Assessment (LCIA) • List and describe steps used in the standard LCIA • Define and list several impact categories • Recognize and critique the LCIA phase in an LCA study
31	LCA VI	<ul style="list-style-type: none"> • Describe the steps in the interpretation phase of an LCA • Explain why the interpretation phase is required • List the steps in the standard method of interpretation • Define completeness, sensitivity, and consistency as they relate to LCA • Recognize and critique the Interpretation phase in an LCA study
32	Introduction to the EIS	TBD
33	Sakonnet Bridge Tour	TBD
34	Sakonnet Bridge EIS - I	TBD
35	Sakonnet Bridge EIS - II	TBD
36-40	Student presentations	TBD