



**University/Academy:** Arab Academy for Science, Technology & Maritime Transport  
**Faculty/Institute:** College of Engineering & Technology  
**Program:** B.Sc. Architectural Engineering and Environmental Design

### Form no. (12): Course Specification

#### 1- Course Data

Course Code: <b>AR 464</b>	Course Title: <b>Environmental Studies 2</b>	Academic Year/Level: <b>4<sup>th</sup> year / 7<sup>th</sup> semester</b>
Specialization: <b>Architecture</b>	No. of Instructional Units Credit <b>3</b> Lecture <b>2</b> Tutorial <b>2</b>	Prerequisite <b>AR362</b>

#### 2- Course Aim

This course is an extension of the course Environmental Studies I. The course introduces the students to the environmental science, in which basic equations are used as a quantitative approach of environmental design. Topics covered include ecological design principles, indoor environmental quality, energy conservation in buildings, and water systems and preservation.

**The course aims at:**

Creating a student who has the required critical skills to fluently discuss and absorb the environmental building design.

#### 3- Intended Learning Outcomes

<b>a- Knowledge and Understanding</b>	<b>Through knowledge and understanding, students will be able to:</b> <ul style="list-style-type: none"><li>• Demonstrate understanding of the various elements of ecological design, elements of mechanical ventilation, thermal calculations, basic science of natural ventilation, basics of plumbing, water consumption, and conservation, as well as the urban heat island and energy conservation.</li></ul>
<b>b- Intellectual Skills</b>	<b>Through intellectual skills, students will be able to:</b> <ul style="list-style-type: none"><li>• Develop deep understanding and analysis of environmental design.</li><li>• Critically analyze environmental issues in architecture as well as provide innovative solutions.</li></ul>
<b>c- Professional Skills</b>	<b>Through professional and practical skills, students will be able to:</b> <ul style="list-style-type: none"><li>• Generate and develop environmental treatments based on educated judgments and quantitative methods.</li></ul>
<b>d- General Skills</b>	<b>Through general and transferable skills, students will be able to:</b> <ul style="list-style-type: none"><li>• Independently seek knowledge and adopt the skills required for continuing education as well as critically respond to the views of others.</li></ul>

#### **4- Course Content**

<b>Week No.1</b>	Introduction
<b>Week No.2</b>	Ecological Design
<b>Week No.3</b>	Ecological Design
<b>Week No.4</b>	Comfort and Thermal Calculations
<b>Week No.5</b>	Natural Ventilation in Buildings: Basics
<b>Week No.6</b>	Natural Ventilation in Buildings: precedents and innovation
<b>Week No.7</b>	Continuation of the previous lecture and evaluation.
<b>Week No.8</b>	Introduction to Active Ventilation Systems in Buildings
<b>Week No.9</b>	Term Paper Presentation
<b>Week No.10</b>	Renewables and PV panels Design
<b>Week No.11</b>	Energy Conservation in Buildings
<b>Week No.12</b>	Continuation of the previous lecture and evaluation.
<b>Week No.13</b>	Water: Plumbing
<b>Week No.14</b>	Water: Conservation Strategies
<b>Week No.15</b>	Revision, Discussions and Feedback

#### **5- Teaching and Learning Methods**

The course comprises a combination of:  
Lectures, book reviews, research, discussion sessions and tutorials.

#### **6-Teaching and Learning Methods for Students with Special Needs**

- Consulting with lecturer during office hours.
- Consulting with teaching assistant during office hours.
- Private sessions for redelivering the lecture contents.
- For handicapped accessibility, please refer to program specification.

## 7- Student Assessment

Asses No.	Procedures used		Start Week No.	Subm. Week No.	Weighting of Asses.
	Type	To assess			
1	(W1) Class Assignment	Knowledge & understanding	1	1	5%*
2	(W2) Class Assignment	Knowledge & understanding, and intellectual	2	2	5%*
3	(W2) Research	Knowledge & understanding, and intellectual	1	3	5%*
4	(W4) Class Assignment	Knowledge & understanding	4	4	5%*
5	(W5) Class Assignment	Knowledge & understanding	5	5	5%*
6	(W6) Term Paper Progress	Knowledge & understanding, Transferable and intellectual	1	6	5%
7	Written exam..	Knowledge and understanding and intellectual skills	7	7	10%
8	(W8) Class Assignment	Knowledge & understanding	8	8	5%*
9	(W9) Term Paper Presentation	Knowledge & understanding, Transferable and intellectual	1	9	10%
10	PV panels Research	Knowledge & understanding, and intellectual	1	10	5%
11	(W11) Report	Knowledge & understanding, Transferable and intellectual	11	12	10%
12	Written exam..	Knowledge and understanding and intellectual skills	12	12	10%
13	(W13) Class Assignment	Knowledge & understanding, and intellectual	13	14	5%*
14	(W14) Class Assignment	Knowledge & understanding, and intellectual	13	14	5%*
15	(W15) Term Paper Submission	Knowledge & understanding, Transferable and intellectual	1	15	10%
16	Written exam..	Knowledge and understanding	16	16	20%
<b>Total</b>					100%

\*Class Assignments to be scored 5% each, however for the best of interest of the student only the best 5 are to be added up (achieving 20% of the whole mark)

## 8- List of References:

<b>a- Course Notes</b>	N/A
<b>b- Required Books (Textbooks)</b>	<ul style="list-style-type: none"> <li>• SZOKOLAY, S.V. Introduction to Architectural Science - The Basis of Sustainable Design, Elsevier Ltd, 2008.</li> </ul>
<b>c- Recommended Books</b>	<ul style="list-style-type: none"> <li>• Gevorkian, Peter. Solar Power in Building Design, McGraw-Hill 2008.</li> <li>• Hyde, Richard. Climate Responsive Design. E &amp; FN Spon, 2000.</li> <li>• McMullan, Ransol. Environmental Science and Building, Palgrave Macmillan, 2007</li> <li>• Smith, Peter. Sustainability at the cutting edge: emerging technologies for low energy buildings. Architectural Press, 2003.</li> <li>• Stitt, Fred. Ecological Design Handbook; sustainable strategies for architecture, landscape architecture, interior design and planning. McGraw-Hill 1999.</li> <li>• Vallero, Daniel. Sustainable Design: the science of sustainability and green engineering. John Wiley and Sons, 2008.</li> </ul>
<b>d- Periodicals, Web Sites, etc.</b>	N/A