

ENVIRONMENTAL DESIGN

DIMENSIONS OF SUSTAINABILITY (1586)

*Supplementary Material
Spring, 2013*

ALLAMA IQBAL OPEN UNIVERSITY
Department of Home and Health Sciences

ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Home and Health Sciences)

Course: Dimensions of Sustainability (1586)
Level: Post-Graduate

Semester: Spring, 2013
Credit: 4 (3+1)

CHECKLIST

This study pack includes the following items:

1. Course Books
2. CD
3. Course Outlines (Units 1-9)
4. Tutor Guide
5. Student Guide
6. Assignments (1 & 2)
7. Assignment Forms
8. Schedule for submitting the assignment and tutorial meetings

Note: If any of the above mentioned material is missing from your pack, please contact at the following address:

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Or

Dr. Nomana Anjum
Program Coordinator/Chairperson
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INTRODUCTION TO COURSE

Recently, Sustainability has become a key issue and its impact on the construction industry, as one of the major user of the world's resources, is being felt and questioned more seriously. This course addresses different dimensions of sustainability as they effect and relate to the built environment. It deals with techniques and issues, which architects, engineers, designers and planners have to handle in their professional activities.

This course is offered in the first semester. The course is divided into two modules. Module one (units 1-5) covers various aspects of sustainability starting with general issues, problems and policies of sustainable development than touching upon architectural approaches to sustainability and highlighting the value/benefits of designing the green/sustainable buildings.

Module two (units 6-9) is of applied nature where range of sustainability concept is demonstrated in the form of case studies. These units will be highly illustrative portraying sustainable approaches experimented in different types of buildings to introduce environment friendly techniques.

Objectives

The specific objectives of the course are to:

- Introduce issues and problems with reference to building industry
- Develop sensitivity to attain ecological balance while planning and designing the buildings
- Examine through case studies of buildings, how different approaches to green design can produce more sustainable patterns of development.

Course Structure

This is a 4 credit hours course and comprises nine units (The course outlines and chapter wise distribution is explained below for your reference).

Unit-1 “Ecologically Sustainable Development” It is based on part 1 of your textbook **Sustainable Practices in the Built Environment by Craig A Langston and Grace K.C. Ding.**

Unit-2 “Ecological Balance with Reference to Built Environment” It is covered in topic 2 of your book **Dimensions of Sustainability by Andrew Scott.** This unit examines the eight stages of design process that gear towards the child friendly environment.

Unit-3 “The Need and Drive for Sustainable Architecture and Urban Design” It is also discussed in the above-mentioned textbook.

Unit-4 “Environmental Economics” It is covered in parts 3 and 4 of book **Sustainable Practices in the Built Environment**.

Unit-5 “Benefits of Sustainable/Green Buildings” is examined in part one chapter one of your book **Green Buildings Pay (available on CD)**.

Unit-6 “Buildings as Engines for Environmental Restorations” It is included in topic 4 of book **Dimensions of Sustainability**.

Unit-7 “Balancing Human, Energy and Building Costs” This unit falls under the chapter 6 of book **Green Buildings Pay (available on CD)**.

Unit-8 “Ecology in Architecture” It is based on second last topic of book **Dimensions of Sustainability**.

Unit-9 “Architecture Revisited” This unit is covered in topic 9 of your book **Dimensions of Sustainability**.

COURSE OUTLINES

Dimensions of Sustainability

Reference Books

- *Dimensions of Sustainability* by Andrew Scott
- *Green Buildings Pay* by Brian Edwards
- *Sustainable Practices in the Built Environment* by Craig A Langston and Grace K.C. Ding

MODULE ONE

Unit-1 Ecologically Sustainable Development

- 1.1 Issues and Problem
- 1.2 Environmental Policies and Strategies

Unit-2 Ecological Balance with Reference to Built Environment

- 2.1 Preserving the Resilience of Natural Environment
- 2.2 Architectural Approaches to Sustainability
- 2.3 Concepts of Dematerialization, Demobilization and adaptation

Unit-3 The Need and Drive for Sustainable Architecture and Urban Design

- 3.1 Responding to the Challenges of Environmental Degradation and Global Climate Change
- 3.2 Conservation of resources (use of less finite resources and more renewable ones)

Unit-4 Environmental Economics

- 4.1 Cost-Benefit Analysis
- 4.2 Estimating Social Costs and Benefits
- 4.3 Project Feasibility (Project selection, Criteria, Intergenerational equity, the measurement of Sustainability)

Unit-5 Benefits of Sustainable/Green Buildings

- 5.1 Direct and Indirect benefits
- 5.2 Wider Global Benefits
- 5.3 Environmental and Ecological Principles
- 5.4 The Running cost of a Sustainable/Green Buildings

MODULE TWO

Unit-6 Buildings as Engines for Environmental Restorations

- 6.1 Case Study to address Green development issues
 - 6.1.1 Organic Design
 - 6.1.2 Natural Lightings
 - 6.1.3 Airy Spaces
 - 6.1.4 Freshness
 - 6.1.5 Natural Beauty/Aesthetics
 - 6.1.6 Control & Productivity

Unit-7 Balancing Human, Energy and Building Costs

- 7.1 Case Study to address the environmental strategy for sustainable/green building
 - 7.1.1 Developing a user centered brief
 - 7.1.2 Drawing up the design plan
 - 7.1.3 Controlling light and ventilation for sustainability

Unit-8 Ecology in Architecture

- 8.1 Case study to study whole range of issues
 - 8.1.1 Urbanism/Planning
 - 8.1.2 Building form and function
 - 8.1.3 User response to building
 - 8.1.4 Solar shading

Unit-9 Architecture Revisited

- 9.1 Case study to assess the building performance
 - 9.1.1 Reducing the building maintenance cost
 - 9.1.2 Reducing the environmental damage
 - 9.1.3 Satisfying the building occupants

STUDENT GUIDE

Dear Student,
Assalam-o-Alaikum!

We welcome you to PGD Leading to M.S. Environmental Design Course entitled “**Dimensions of Sustainability**”. This course is part of the first semester of your PGD Leading to M.S programme.

Course Objectives and Course Structure

Course Objectives and Structure of the course has been explained earlier in the tutor guide. Please go through the details carefully and follow them accordingly.

Lecture Sessions/Part Time Tutors

You are allocated a part time tutor. The name and address of your tutor will be provided to you. The tutor will help and guide you in studying the books and conducting activities related to study units. You are expected to take full advantage of the tutor knowledge and experience. These tutors are also responsible for marking your assignments.

Make all efforts to complete your written assignment according to the prescribed schedule and try your best to attend all the study sessions according to the timetable provided to you.

Schedule for lecture sessions is arranged on fortnightly bases. The specific dates in the form of tutorial schedule are being provided separately. Try to attend these meetings regularly to get proper guidance from your tutor.

Assignments

The course includes two assignments, which are compulsory for successful completion of the whole course. Each assignment is of 100 marks and out of these, students obtaining 40 marks will be declared pass.

Assignment No. 1 It is a theory based assignment and must reach your assigned tutor before the due date. **Units 1 -7 are included in your assignment.** The schedule of submitting the assignment is provided separately. The tutor will send the marked assignment back to the students within 15 days, if you do not receive the marked assignment after 15 days please contact your tutor or regional office of the Allama Iqbal Open University.

The **assignment No. 2** is research based. You should start working on this assignment in the beginning of semester to complete it in time for write up and presentation in workshop well in time. **Last two units are left out to adjust the study period but you must prepare them for your final exams.**

Note: Do not forget to dispatch the prescribed forms along with the complete assignments.

Methods of Study:

Study period of 16 weeks has been allocated for studying this course through distance learning, whereas 17th and 18th weeks are kept for general assessment and for final examination.

Units	Assignments	Study period
1-2		4 weeks
3-6		4 weeks
7	Assignment 1	2 weeks
8-9		2 weeks
Revision	Assignment 2	4 weeks
Preparation for examination		2 weeks

You are expected to spend four weeks on studying first two units. This will help to improve your reading speed and get familiar with the contents of the units. The next three Units, 3 to 6, will become easier for you and you will be able to study them in comparatively less time. You can spend four weeks on studying these four units, during the ninth week you can study the Unit No. 7 and during the tenth week, you can complete your first assignment and dispatch to your tutor.

Study Projects

You are also advised to address the questions at the end of chapters and share your views in the tutorial sessions.

Unit 8 to 9 can be studied during 11th and 12th week respectively and you can start working on your assignment No.2 in the 6th week and complete it along with the revision of your book during the weeks 13-16. The last two weeks can be kept for examination and its preparation.

Workshop

Workshop will be arranged for three days. Schedule of the workshop and venue will be sent to the students during the study period. Workshop will cover some of the lectures of the specialist on important topics. The tutor will provide guidance for the workshop. Attendance in workshop is **compulsory** for the students.

Final Examination

At the end of the course, there will be a final examination. All the students will be expected to take this examination in the examination halls, especially established for this purpose.

For any queries, you can write to the course coordinator. Suggestions for improvement will also be welcomed. We wish you all the best.

Regards,

Dr. Nomana Anjum
Chairperson/Programme Coordinator

TUTOR GUIDE

Dear Tutor,

On behalf of AIOU and course team of “Environmental Design Programme,” I welcome you as a tutor to the “Dimensions of Sustainability” course. You might be aware that the students enrolled in this programme have varied professional background and work experience. However, they all have common interest to deal with environmental issues related to the building design.

These students have very limited contact with their coursemates and the part time tutors. It is therefore important to keep in mind that some of the distance-learning students have had no links with education during the past few years after completing their formal education, therefore, they might lack confidence. Secondly, distance-learning students are involved in studying during their spare time, probably after office hours. You are therefore requested to guide and help the students while keeping these issues in mind. Some students may need help in developing professional attitudes as well as understanding the facts about design and environmental psychology.

Study Center:

The main purpose of establishing the study center for distance learning students is to provide help and guidance for the difficulties faced by the students, while studying at home. The study centers have been established in local institutions. During the lecture sessions, it is required to provide guidance to the students to sort out their problems.

Assignments:

In the distance learning system, studying the course units has its own importance but assignments and workshops are the major source of link between tutor and the student. Therefore, it is important to offer your comments through these assignments. Express your views in such a way that the student is not discouraged, hurt or feels depressed after going through your comments.

You are also expected to guide on issues like methods of solving assignments, effective methods of studying, and methods to improve study habits and working hard.

Assignment two is research based and requires field survey. Advise students to discuss the assignment in the lecture sessions at various stages of research activity (at least three times before finally presenting in the workshop).

- 1. The stage one may be clarity on topic to develop objectives of study.**
- 2. The stage two can be literature review and design of research tool (questionnaire etc).**
- 3. The stage three can be data analysis and presentation style.**

It is anticipated that the student will submit their assignment in time according to the prescribed schedule. You are, therefore, requested to mark the assignments within 15 days and return these with detailed comments within the scheduled dates.

Marking Guides are provided to you. You are expected to follow the instructions and make full use of these guides while marking the assignments. The students are expected to avoid giving unnecessary details and try to be brief and comprehensive. While marking the assignments, the tutor has to assess whether the students have followed the instructions provided to them or not.

Regards,

Dr. Nomana Anjum
Programme Coordinator/Chairperson

ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Home and Health Sciences)

WARNING

1. **PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.**
2. **SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE'S OWN WILL BE PENALIZED AS DEFINED IN "AIOU PLAGIARISM POLICY".**

Course: **Dimensions of Sustainability (1586)**
Level: **Post-Graduate**
Credits: **4 (3+1)**

Semester: **Spring, 2013**
Marks: **100**
Pass Marks: **40**

ASSIGNMENT No. 1
(Units: 1–7)

Note: 10 marks for attendance and class participation.

- Q. 1 Define and explain “sustainable development” with reference to economic growth and environment? (12)
- Q. 2 How strategic planning can minimize environmental impact generated by built environment, focus on preserving the resilience of natural environment? (12)
- Q. 3 Discuss the concept of dematerialization and demobilization to achieve sustainability in city environment. (12)
- Q. 4 What strategies should be adopted to respond the challenges of environmental degradation due to building industry? (12)
- Q. 5 Why it is important to apply the techniques of “Cost Benefit Analysis” to any new building design project? Discuss the advantages and disadvantages of Social Cost Benefit Analysis. (14)
- Q. 6 Discuss “Green Building Concept” in today's architectural designs with reference to:
a) natural lighting,
b) organic design and
c) natural beauty (14)
- Q. 7 Determine the significance of conservation of energy with reference to day lighting and ventilation in green architectural design. (12)
- Q. 8 Why it is difficult to persuade the private developers to use new approaches or techniques to sustainable development? (12)

ASSIGNMENT No. 2

Research Project: 01 Credit

Project Options

Select any one of the following topics:

1. **Select two major on going commercial building projects and assess:**
 - a) Feasibility of the project
 - b) Cost benefit analysis
 - c) Social cost benefit analysis
 - d) Discuss what environmental concerns have been ignored in project design and what environmental up gradation measures can be adopted to make it environmentally sustainable.

2. **Conduct case studies of at least two buildings for comparative study, select one recently built building and one built in 90s.**
 - a) Assess building materials used on sustainability principles
 - b) Analyze the running cost of selected buildings with special reference to energy bills
 - c) Evaluate the use of day-lighting and artificial lighting.

3. **Carry out Review of Literature both on internet and any local library to find at least 10 research articles on “Low Energy Building Design”**
 - a) Write an analytical report to discuss low energy consumption strategies in various types of buildings reviewing various global case studies.
 - b) Find out alternative means of energy production and their application in the building design.
 - c) Conclude your report with suggestions and remedies in the local context.

General Instructions

1. This assignment is of practical nature, you have to prepare a research report and present it in the workshop prior to the final examination (you do not need to send this to your tutor before the workshop).
2. The workshop component is mandatory for all the students. You cannot sit in the final examination without completing this project and presenting it in the workshop.
3. This assignment requires thorough review of literature to develop the conceptual framework before conducting the field research for this project, which also needs to be incorporated in the report systematically.

4. You can select any of the given topics for your project; the field visits should preferably be based close to your home address.
5. Include the following sections in your report:
 - a) Introduction and objectives of the study project
 - b) Methodology for field research
 - c) Review of literature
 - d) Data analysis with statistics and graphical/visual representations
 - e) Conclusion/suggestions
 - f) Appendices and bibliography
6. Prepare three copies of this assignment, one for yourself, one for the tutor and the **third one for the Department (AIOU) addressed to the Programme Coordinator for record.** Attach three assignment forms with this assignment as for assignment one.
7. As the student is supposed to do a presentation in the workshop to the resource person and coursemates, he should prepare transparencies or other illustrative material for effective presentation.
8. You are advised to consult source material frequently. If you need any guidance you may contact your tutor or write to the Department (AIOU).

MARKING GUIDE

It is expected from the tutors that they will mark the assignments carefully and will follow the uniform marking standards for all the students. They are also advised to guide the students for their strengths and weaknesses and also to give guidelines for better performance in future.

For **theory based assignment** tutors are requested to follow the marks division as indicated on the assignment that is eight questions, making a total of hundred. The questions that are further divided into parts a, b, etc. accompany a further division of marks as well.

For the **research based assignment** the allocation of marks is indicated as under:

Research Activity	50 Marks
Report Writing.....	25 Marks
Presentation in the Workshop.....	25 Marks

You are requested to stick to the guidelines provided to maintain the standardization and uniformity.