ENVIRONMENTAL DESIGN

INTRODUCTION TO ENVIRONMENTAL DESIGN

Supplementary Material
Spring, 2014

ALLAMA IQBAL OPEN UNIVERSITY
Department of Home and Health Sciences

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

Course: Introduction to Environmental Design (1575)
Level: Post-Graduate **Semester: Spring, 2014**

CONTENT LIST

This study pack includes the following items:

1. Course Books
   i) Climate Responsive Design
      By Richard Hyde
   ii) The Green Imperative
      By Victor Papnek
   iii) Environmental Control Systems
      By Fuller Moore
2. Course Outlines (Units1-9)
3. Study Guide
4. Assignments (1 & 2)
5. Assignments Forms
6. Schedule for Submitting the Assignment and Tutorial Meetings

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

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INTRODUCTION TO ENVIRONMENTAL DESIGN

Credit Hours – 4 (3+1)

Reference Books:

The Green Imperative, Victor Papanek
Climate Responsive Design, Richard Hyde
Environment Control Systems Heating Cooling and Lighting

UNIT 1:
Introduction to Environmental Design

1.1 Definition/Concept (Explanation of the Terms Environment Design)
1.2 Historical context in Relation to Building Design
1.3 Environmental Movements
1.4 Individual and State Responsibility
1.5 Role of the Designer

UNIT 2:
Environmental Consideration for Building Design – A

2.1 Climate/Orientation (Including wind, solar gain/glare, shading, dust etc)
2.2 Sustainable Design

UNIT 3:
Environmental Considerations for Building Design – B

3.1 Building Structure
3.2 Roofs
3.3 Walls
3.4 Floors

UNIT 4:
Materials and Sustainability

4.1 Introduction
4.2 Structural Materials, Mud, Brick, Steel, Timber, Concrete
4.3 Finishing Materials- Paint, Carpets and Upholstery, Plastics'
4.4 Criteria for Selection of Eco-Friendly Material

UNIT 5:
Energy Source

5.1 Introduction
5.2 Energy Source-Fossil Fuels Depletion
5.3 Impact of use of Fossil Fuels on Environment-Global Warming
5.4 Alternative Energy –Environmentally Friendly Sources-Wind, Solar Energy

UNIT 6:
Ventilation, Heating and Cooling

6.1 Natural Ventilation
6.2 Passive Solar Heating System
6.3 Passive Solar Cooling System
6.4 Active Heating & Cooling Systems

UNIT 7:
Water, Sanitation and Solid Waste Disposal

7.1 Source of Water Supply
7.2 Pollution of Water- Causes and Impacts
7.3 Water Conservation
7.4 Sanitation Systems
7.5 Solid Waste- Types, Disposal and Recycling

UNIT 8:
Lighting

8.1 Environmental Considerations
8.2 Day Lighting – Design Strategies
8.3 Artificial Electric Lighting
8.4 Environmental Control Systems for Lighting

UNIT 9:
Environmental Acoustics

9.1 Introduction (Basic Concepts & Fundamentals of Sound and its Controls)
9.2 Noise Control & Design Criteria
9.3 Site Considerations
9.4 Noise Control Materials

LIST OF PRACTICALS

1. Assessment of thermal comfort in various activity areas in a specific building using the environmental meter to determine the comfort zone.

2. Assessment of indoor and outdoor noise sources using noise meter to develop noise control strategies for a specific type of building.

3. Assessment of natural and artificial light provision in various activity areas of buildings using light meter to develop light control strategies.

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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: Introduction to Environmental Design (1575) **Semester: Spring, 2014**
Level: Post Graduate **Total Marks: 100**
Pass Marks: 40

ASSIGNMENT No. 1
(Units: 1-7)

Note: Attempt all questions.

Q.1 Discuss the Global Historical Context of Environmental Design. Describe the significance of Environmental Movements with reference to Ecological Building Design. (15)

Q.2 a) What ethical responsibility does a designer has?
b) How can a designer be effective in developing and implementing a sustainable approach? (15)

Q.3 What are the basic energy resources? How energy crisis can be strategically resolved in Pakistan? How can we use alternative energy sources effectively for minimal impact on environment? (15)

Q.4 Describe the types of Solid Wastes? Review the waste disposal methods in your area. Explain the benefits of recycling to minimize the environmental burden. (10)

Q.5 What is difference between active and passive solar heating systems? Explain the passive heating strategies appropriate for your own region. (10)

Q.6 What are major sources of air pollution in Pakistan? Describe the control measures for any one major source. (10)

Q.7 What is the significance of "Bio-Climatic" Building Design in the Context of Pakistan? (15)

Q.8 How can we maximize the use of day lighting in the Building design? Discuss environmental considerations in the use of artificial lighting. (10)

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ASSIGNMENT No. 2

PART I **Marks: 80**

Environmental Appraisal of Building

Project Proposal

Select an existing building for your design proposal that;

- Is not too big; in the range of 500 – 1000m^2.
- Is preferably independent of (detached from) other building or alternatively is clearly an independent part of a larger building.
- Has a clear limitation or problems that you can identify in relation to environmental design and /or ecological issues.

Brief

a) Visit the building (preferably more than once) and make a set of scale measured survey drawings. These should include a plan of each floor plus sufficient section and elevation views to describe the building comprehensively. If you can find a set of existing drawings, take a few check measurements then make a set of traced drawings for your project.

b) Make a concise, written environmental appraisal of the building taking particular attention to:

- Overall building from; plan / cross- sectional shape / 3-D massing, orientation, site considerations etc.
- Nature of structure and structural materials used.
- Nature of finishes to walls, ceilings, floors.
- Nature of heating, ventilation, air-conditioning etc.
- Aspects of artificial and natural lighting and noise / sound control.
- Aspects of landscaping.
- Aspects of water supply, drainage etc.
- Aspects of Waste Management arrangements.

All of the above must be considered in relation to local climatic conditions throughout the year.

This will form the first part of your written report and be maximum of approximately 500 words. Use supporting photographs, sketches and diagrams as you consider appropriate.

c) The information from your appraisal ('b' – above) can now be used to develop sketch proposal ideas that attempt to rectify the environmental shortcomings identified. Make a sketchbook of your ideas as they develop; if you are using predominantly CAD techniques ensure you have saved copies of the various stages of your design development to include in your sketchbook.

d) Make a concise written account of your design approach suggesting how your proposal responds to the issues mentioned in the environmental appraisal of the existing building ('b' above). Include in this basic description of the overall conceptual approach you have adopted. This account together with your appraisal ('b' above) will form your 'Project Report'.

e) Make a set of presentation drawings showing plan and also elevation / sectional views as appropriate to clearly describe your proposal. The proposal presentation drawings should be clearly annotated to indicate how your design solution responds to the environmental criteria identified in your project report.

Presentation Criteria

a) The project report should be supported with visual materials as necessary / appropriate.

b) Text for the project report should be 4-5 typed pages, single spaced and with font size 14 for headings and 12 for text.

c) A sketchbook (suggested size, A3) should clearly show how your design proposal has developed from initial concept ideas to the final solution.

d) The existing survey drawing and design project drawings may be presented by either hand-drawn or CAD techniques of a professional standard. The proposal drawings should clearly indicate the nature of the environmental problems being dealt with and the suggested changes, modifications, strategies etc. to deal with them.

General Instructions

1. This assignment is of a practical nature, you have to prepare a design proposal and present it on schedule time/date.
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 design project assignment requires careful thought in relation to the selection of the building, making / acquiring survey drawings and developing the design proposal. All of these considerations will be incorporated into you 1000 word project report.
4. Select a building close to your home address to ensure you have ready access for inspection and appraisal.
5. Your report should cover both theoretical and practical components.
6. Include the following sections in your report:
    a) Introduction and objectives of your study
    b) Field research strategy/ methodology

c) Review of relevant literature
d) Graphical representations
e) Analysis/Conclusion/Suggestions
f) Appendices/ Bibliography

7. As the student is supposed to do a presentation in the workshop to the resource person and course mates, he should prepare power point presentation.
8. You are advised to consult with source material frequently as you undertake your design project. If you need any guidance you may contact your tutor or write to the Programme Coordinator.
9. Prepare three copies of this assignment, one for yourself, one for the tutor and the third one for the Department of Home and Health Sciences (AIOU) for record. Attach three assignment forms with this assignment as for assignment one.

PART II **Marks: 20**

PRACTICAL

1. Assessment of thermal comfort in various activity areas in a specific building using the environmental meter to determine the comfort zone.
2. Assessment of indoor and outdoor noise sources using noise meter to develop noise control strategies for a specific type of building.
3. Assessment of natural and artificial light provision in various activity areas of buildings using light meter to develop light control strategies.

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. accompanies a further division of marks as well.

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

Research Activity	40 Marks
Report Writing	20 Marks
Presentation in the Workshop	20 Marks

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