Seminars in Building Technology (Arch6028/65747) - 1999/2000
Section One - Energy Efficiency in Buildings

Course Description (revised 21/09/99)

1. Background

Buildings are significant users of energy in a society and their energy consumption has important implications to social, economic and environmental issues. A challenging task of architects and other building professionals today is to design and promote energy efficient buildings in a cost effective and environmentally responsive way.

This course will introduce the basic concepts of energy efficiency in buildings, provide practical information of energy efficient technologies, and explain the common methods for building energy analysis. Students will study the topics through readings, discussions, and project analysis. It is hoped that the knowledge and skills acquired could help generate innovative architectural designs and improve performance of building systems.

2. Duration

The course will last for a total of 12 contact weeks (one semester) from 10 September to 3 December 1999. Normal contact hours are as follows:

Time: 10:40 a.m. to 12:35 p.m. (Fridays)
Venue: KB-230, 2/F, Knowles Building

3. Outline

Topics	Lecture Date
1. Basic Principles	10 September 1999
2. Energy Efficient Technologies for Buildings	
2.1 Passive Cooling and Daylighting	17 September 1999
2.2 HVAC Systems	24 September 1999
2.3 Active Solar and Photovoltaics	8 October 1999
3. Building Energy Analysis Methods	
3.1 Building Energy Simulation	15 October 1999
3.2 Building Energy Audits	22 October 1999
4. Building Energy Efficiency Standards	
4.1 Building Energy Codes in Hong Kong	29 October 1999
4.2 Assessment of Building Energy Performance	5 November 1999
5. Case Studies of Buildings	
5.1 Case Studies (I)	12 November 1999
5.2 Case Studies (II)	19 November 1999
5.3 Case Studies (III)	26 November 1999
Review and Student Consultation	3 December 1999

4. Assessment

This section of the course "*Seminars in Building Technology*" represents half of the marks for the whole course. Student performance in this section will be based on continuos assessment of two types:

(a) Homework assignments - 40%

(b) Design/Analytical project - 60%

Homework related to the topics of the course will be assigned regularly and students are requested to work independently on this. Submission of homework assignments should be punctual and late submission will receive reduction in marks.

The objective of the design/analytical project is to allow the students to study the factors affecting energy efficiency in buildings and explore ideas for energy efficient design. The project should be carried out by student groups each of three persons normally. Please refer to the project brief for more information.

5. References

CIBSE, 1998. *Energy Efficiency in Buildings: CIBSE Guide*, Chartered Institution of Building Services Engineers, London. [on order; also available in PolyU library]

Givoni, B., 1994. *Passive and Low Energy Cooling of Buildings*, Van Nostrand Reinhold, New York. [Call No. 697.93 G53]

Goulding, J. R., Lewis, J. O. and Steemers, T. C. (eds.), 1992. *Energy Conscious Design: A Primer for Architects*, B. T. Batsford, London. [Call No. 720.472 E56 c]

Goulding, J. R., Lewis, J. O. and Steemers, T. C. (eds.), 1992. *Energy in Architecture: The European Passive Solar Handbook*, B. T. Batsford, London. [Call No. 720.472 E5]

Kasian Kennedy Design Partnership, 1995. *Design Smart: Energy Efficient Architectural Design Strategies*, B.C. Hydro, Burnaby, British Columbia, Canada. [Call No. 725.20472 K1]

Littlefair, P. J., 1996. *Designing with Innovative Daylighting*, BRE Report, Building Research Establishment, Watford, UK. [Call No. 729.28 L77]

Roaf, S. and Hancock, M. (eds.), 1992. *Energy Efficient Building: a Design Guide*, Blackwell Scientific Publications, Oxford, England. [Call No. 720.472 E56]

Santamouris, M. and Asimakopoulos, D. (eds.), 1996. *Passive Cooling of Buildings*, James and James, London. [Call No. 697.93 P288]

State Projects, 1993. *Building Energy Manual*, NSW Public Works, Australia. [available in CUHK and CityU libraries]

Tuluca, A. (ed.), 1997. *Energy Efficient Design and Construction for Commercial Buildings*, McGraw-Hill, New York, 1997. [Call No. 696 T92]

Watson, D. (Ed.), 1993. *The Energy Design Handbook*, American Institute of Architects Press, Washington, DC, 1993. [Call No. 720.472 E56 W]

Watson, D. and Lab, K., 1983. *Climatic Design: Energy-efficient Building Principles and Practices*, McGraw-Hill, New York, 1983. [Call No. 697.9 W3]

涂逢祥(主編)，1996。《建築節能技術》，中國計劃出版社，北京，1996 年 9 月。 [Call No. 中 920 1586]

6. Lecturers

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