

# Islamic Architecture and the Environment

Professor Nasser Rabbat

MIT Department of Architecture, School of Architecture and Planning

[nasser@mit.edu](mailto:nasser@mit.edu)

## Course Description

This course proposes to study how Islamic architecture and urban planning coped with environmental constraints in various areas and different climates and turned them into constructive design tools. It examines the environmental strategies behind the design of selected examples ranging in scale from the region, to the city, the house, the garden, and the single architectural element. It explores the social, cultural, symbolic, and psychological dimensions of environmental design as they developed over time to enrich, modify, or even obscure their functional origins.

## Topics Covered:

The Image of Paradise and its models: Koranic gardens, Dome of Heaven, Celestial Dome; Muqarnas

Movable Architecture: tents, yurts, and camps.

Shadow and Shading devices; Trees; Tiles; Colors

Wind catchers and other cooling techniques

Orientation and the city scape: streets, openings, houses.

Water Architecture: fountains, sabils, qanat, shadirwan, waterwheel, aqueducts, Hammams

Andalusian Examples: Madinat al-Zahra, Alhambra, Generalife

Chahar Bagh symbolism: Representation of garden in painting

Timurid, Mughal, Ottoman, and Persian Gardens

Representation of garden in painting (Nasuh, Persian, Mughal, Qajar)

Architecture and Travel: Caravanserai (Ottoman chimneys), Grand Hotels

The Courtyard House: Hasan Fathy's notion on Courtyard houses.

Contemporary indulgences: Diplomats' section in Riyadh, Hollywood's representations, Summer villas in the Mediterranean.

The city scape: streets, openings, houses

## **A Brief Introduction to the History and Ecology of the Islamic World**

### Reading

- Ernst J.Grube, "What is Islamic Architecture?" in G. Michell ed. Architecture of the Islamic World: Its History and Social Meaning. 11-14

## **Environment, Climate, and Architecture in the Islamic World**

Historical Precedents

Movable Architecture: Tents, the dwelling of the nomad.

Rural and Urban Settlements in Arabia

### **Early Islamic Settlements**

Mecca, Medina: The house of the Prophet at Medina.

The first garrison towns of Islam: Kufa, Basra, Fustat, Qayrawan

### Readings

- Ralph Knowles, Energy and Form: An Ecological Approach to Urban Growth (MIT Press, 1974), 5-15
- Paul Oliver, Dwellings: The House Across the World (Austin, 1987), 113-24
- Encyclopedia of Islam, 2d edition, articles on Basra, Kufa, and Kairawan

### **Umayyad Settlements**

Paradisial environment? Ideal environment? Or symbolic environment?

Pre Islamic prototypes:

Byzantine, Greco-Roman, and Hellenistic prototypes.

Mesopotamian, Parthian, and Sassanian prototypes.

Levantine, Arabian, and South-Arabian influences.

The Image of Paradise and its models: Koranic gardens, Dome of Heaven

### Readings

- Jere Bacharach, Marwanid Umayyad Building Activities: Speculation on Patronage," Muqarnas 13 (1996): 27-44.

- Klaus Brisch, "Observations on the Iconography of the Mosaics in the Great Mosque at Damascus," in, *Content and Context of Visual Arts in the Islamic World*.(Philadelphia, 1988) 13-20.
- Oleg Grabar, *The Formation of Islamic Art*. (New Haven, 1973), 1-44, 139-78.
- Oleg Grabar, "Umayyad Palaces Reconsidered," *Ars Orientalis* 23, (1993): 93-102.
- Oleg Grabar, et al. *City in the Desert, Qasr al-Hayr East*. (Cambridge, 1978), 148-73.
- Robert Hillenbrand, "La Dolce Vita in Early Islamic Syria: The Evidence of Later Umayyad Palaces," *Art History* 5, 1 (March 1982) 1-35.

## **Medieval Links**

Fustat Houses

Residential medieval architecture: Mamluk Qa'as: the spreading of the royal model.

Residences on the move: Caravansaries, the hostels of the great trading routes.

The Rab': A unique medieval urban residential types

### Readings

- L. Ibrahim, "Residential Architecture in Mamluk Cairo," *Muqarnas*, 2 (1984) 47-59.
- Oleg Grabar "Palaces, Citadels and fortifications," and Eleanor Sims, "Trade and Travel: Markets and Caravanserais," in G. Michell, *Architecture of the Islamic World*.
- Hoag, chapter 9. *Domestic Architecture of the Ayyubids and Mamluk*

## **The Alhambra in Granada**

The Islamic Versions of the Villa Urbana and Villa Rustica

Madinat al-Zahra

Granadine Villas

### Readings

- James S. Ackerman, "The Villa as Paradigm," *Perspecta*. 22 (1985): 10-31.
- James Dickie, "The Islamic Garden in Spain," in: E. MacDougall, *The Islamic Garden*, 87-105.
- Oleg Grabar, *The Alhambra*, 25-132

- idem, "Granada: A Case Study of Arab Urbanism in Muslim Spain," in *The Legacy of Muslim Spain*, ed. S. K. Jayyusi (Leiden, 1992), 88-110.
- Nasser Rabbat, "The Palace of the Lions in Alhambra and the Role of Water in its Conception," *AARP/Environmental Design 2* (1985): 64-73.

## **Water and The Islamic Garden**

Water Architecture: fountains, sabils, qanat, shadirwan

### Readings

- Saleh Lamei Mostafa, "The Cairene Sabil: Form and Meaning," *Muqarnas 6* (1989): 33-42.
- Nasser Rabbat, "Shadirwan" in the *Encyclopedia of Islam*, 2d ed. 9: 175-76.
- Annemarie Schimmel, "The Celestial Garden," in Elizabeth MacDougall and Richard Ettinghausen, eds., *The Islamic Garden* (Dumbarton Oaks, 1976), 13-39.
- Yasser Tabbaa, "The Medieval Islamic Garden: Typology and Hydraulics," in John Dixon Hunt ed., *Garden History: Issues, Approaches, Methods* (Dumbarton Oak, 1992), 303-29.
- Yasser Tabbaa, "Towards an Interpretation of the Use of Water in Islamic Courtyards and courtyard Gardens," *Journal of Garden History 7*, 3 (1987): 197-220

## **Planned Royal Cities**

Baghdad and Samarra as models

Cairo: royal residence of the Fatimid Caliphs

The Mughal Royal Palaces: Fatehpur Sikri

Isfahan: The Creation of the Safavid Capital

### Readings

- Nezzar AlSayyad, *Cities and Caliphs*, 133-58.
- Attilio Petruccioli, "The Geometry of Power: The City's Planning," in Brand and Lowry, *Fatehpur-Sikri*, 50-64.
- Ebba Koch, "Mughal Palace Gardens from Babur to Shahjahan (1526-1648)," *Muqarnas 14* (1997): 143-65.
- Donald Wilber, *Persian Gardens and Garden Pavilions*, 39-5

## **The Chahar Bagh**

Timurid, Mughal, Ottoman, and Persian Gardens

Symbolism: Representation of Garden in Painting

### Readings

- James Dickie, (Yaquub Zaki) "The Mughal Garden: Gateway to Paradise," Muqarnas 3 (1985): 128-37.
- James Dickie, "Garden and Cemetery in Sinan's Istanbul," AARP/Environmental Design 12 (1987): 70-85.
- Lisa Golombek, "The Gardens of Timur: New Perspectives," Muqarnas 12 (1995): 137-47.
- Susan Jellicoe, "The Mughal Garden," in Ettinghausen and MacDougall, The Islamic Garden.
- Charles W. Moore, William J. Mitchell, William Turnbull, Jr., The poetics of Gardens (Cambridge, Mass. : 1988).
- Elizabeth Moynihan, Paradise as a Garden in Persia and Mughal India, New York: Braziller, 1979.

## **Traditional Houses**

Courtyard Houses

Iranian Houses and Pavilions.

Ottoman Residences and Pavilions

Adobe Architecture:

Earth: Building Materials and their Environmental Properties

### Readings

- Mousallam Sakka Amini, "Islamic and Japanese Traditional Houses and Their Social Meaning: A Comparative Interpretation." Islamic Quarterly 37, 4 (1993): 266-79.
- Tulay Artan, Architecture as a Theater of Life: Profile of the 18th Century Bosphorus. MIT, PhD (1988).
- William Curtis, "Type and Variation: Berber Collective Dwellings of the Northwestern Sahara," Muqarnas 1 (1982): 181-209.

- Ron Fuchs, "The Palestinian Arab House and the Islamic 'Primitive Hut'," *Muqarnas* 15 (1998): 157-77.
- Ronald Lewcock, *The Old Walled City of San'a'*, 55-85.
- Guy T. Petherbridge, "The House and Society," in G. Michell, *Architecture of the Islamic World*, 193-204.
- Bernard Maury, André Raymond, Jacques Revault and Mona Zakariya. *Palais et maisons du Caire: II époque ottoman (XVIe-XVIIIe siècles)*. Paris: CNRS, 1983.
- Fredrich Raguetta, *The Lebanese House during the 18th and 19th Centuries*, chapters 2 and 4.
- Albert Szabo and Thomas J. Barfield, *Afghanistan: An Atlas of Indigenous Domestic Architecture*, Austin: University of Texas Press, 1991.

## **Environmental Responsiveness in Traditional Architecture**

Shadow and Shading devices

Wind catchers and other cooling techniques

Orientation and the city scape: streets, openings, houses.

The Interplay of History, Culture, and the Climate in Traditional Architecture (Heschong)

### Readings

- Michael E. Bonine, "Aridity and Structure: Adaptations of Indigenous Housing in Central Iran," in Clark and Paylore, *Desert Housing: Balancing Experience and Technology for Dwelling in Hot Arid Zones*, 193-219.
- Coles and Jackson. *A Windtower House in Dubai*.
- Daniel Dunham, "The Courtyard House as a Temperature Regulator," *The New Scientist* (September 8, 1960): 663-66.
- Lisa Heschong, *Thermal Delight in Architecture*.
- David A. King, "Architecture and Astronomy: The Ventilators of Medieval Cairo and the Secrets," *Journal of the American Oriental Society* 104, 1 (1984): 97-133.
- Susan Roaf, "The Windcatchers of the Middle East," in *Islamic Architecture and Urbanism*, ed. Aydin Germen (Dammam, Saudi Arabia, 1980), 257-68.

## **Revival of the Vernacular**

H. Fathy, W. Wassif, N. Khalili

Hasan Fathy's conceptualization of the courtyard house.

### Readings

- Hassan Fathy, Architecture for the Poor.
- Besim S. Hakim, "The "Urf" and its role in diversifying the architecture of traditional Islamic cities," Journal of architectural and planning research. 11, 2 (1994): 108-127.
- Ronald Lewcock, "Working with the Past," in Theories and Principles of design in the Architecture of Islamic Societies (AKPIA, 1988), 87-96.

## **The Environmental Theme and Developing Countries**

Contemporary examples: the environmental category in the Aga Khan Award for Architecture

Students presentations of examples chosen from the Aga Khan Award projects

### Readings

- William Curtis, Modern Architecture since 1900, chapter 27: Modern Architecture and Developing Countries since 1960.
- Aga Khan Award for Architecture Publications and Monographs