



ISLAMIC AESTHETIC FRAMEWORK  
IN BUILDINGS  
A STUDY OF MADINA FEZ, MOROCCO

BY

ROUINI IMAN

A thesis submitted in fulfilment of the requirement for  
the degree of doctor of philosophy

Kulliyyah of Architecture and Environmental Design  
International Islamic University  
Malaysia

SEPTEMBER 2010

## ABSTRACT

The meaning of Islamic Architecture has been subject to debate since many years. Therefore, this research attempts to give responses to mainly four questions. The first question concerns the existence of standards of aesthetics and aesthetics perception and evaluation. The second question considers the meaning of Islamic aesthetic in buildings. While the third question investigates the aesthetic components in Muslim buildings, and the fourth question is about the definition of the design elements that affect visual comfort in Muslim buildings. These questions were answered theory and case study researches. The theoretical research aims firstly to define the tools used to evaluate aesthetic perception and aesthetic judgment. Secondly, it aims to extract the principles and ethics of Islamic aesthetic innovation throughout a study of Qur'ān and the tradition of the prophet Muhammad, peace and blessing be upon him. On the other hand, the case study research deals with aesthetic innovation practices through a descriptive and analytical study of significant Muslim historical masterpieces. In addition, for a much-detailed analysis the traditional city of Fez is chosen as case study. The research method adopted includes a building evaluation, an in-depth interview and a perception survey. The aim is mainly to define the design constants and variables. The research findings helped to draw a framework for Islamic innovation in buildings, which includes eight elements: four constants and four variables. The constants concern *tawhīd*, the divine order, functionality and the alchemy of materials, while the four variables include wisdom and professional knowledge, habits, techniques, and forms. Thus any attempt of innovation regarding building in Muslim context must take onto consideration the above constants and variables.

## ملخص البحث

في ظل التساؤلات التي تطرح حول ماهية الجمالية في الهندسة الإسلامية تأتي أهمية هذا البحث ليحاول إيجاد أجوبة لأربعة أسئلة. اولها عن حقيقة وجود معايير للتصور و الحكم الجمالي. و الثاني حول معنى الجمالية في الإسلام و تحديدا فيما يخص موضوع جمالية البناءات. أما الثالث فيعتبر تحديد المكونات الجمالية الإسلامية في بنايات المسلمين، بينما يقصد الرابع التعريف بالعناصر الهندسية و الزخرفية التي تأثر في الراحة البصرية باعتبارهااته الأخيره مكونا جماليا يحظى بأهمية كبرى في العمل الهندسي. تمت الإجابة عن هذه الأسئلة من خلال البحث النظري في الآليات العلمية التي تستعمل في التقييم و الحكم الجمالي، ثم استنباط المبادئ و الأخلاقيات الإسلامية التي تخص الإبداع الجمالي في البناءات، من خلال دراسة لنصوص القرآن و سنة النبي صلى الله عليه و سلم. و كذلك اهتم البحث بالجانب التطبيقي من خلال دراسة وصفية و تحليلية لبنايات المسلمين التاريخية، تم الإعتماد فيها على ثلاثة وسائل منهجية بما في ذلك: تقييم للبناءات، استجابات معمقة مع مختصين بالإضافة إلى استمارة تعباً من طرف الساكنة المستهدفة بالدرس. ليتم بعد ذلك استخلاص الثوابت و المتغيرات في ميادين الإبداع الهندسي الإسلامي. و من أجل قراءة تحليلية تفصيلية تم اختيار بنايات المدينة الأثرية فاس بالمغرب الأقصى كنموذج للدرس. نتائج البحث مكنت من صياغة إطار للإبداع الإسلامي، تم فيه تحديد ثمانية عناصر، منها أربعة تعد من الثوابت، و هي التوحيد، النظام الرباني، الوظيفية و كيمياء المواد. و الأربعة الأخرى تعد من المتغيرات، وتشمل الحكمة البشرية، العادات البشرية، التقنيات و الأشكال. و من هنا يكون نجاح الفعل الإبداعي في الهندسة الإسلامية رهينا باعتبار العناصر الثمانية كاملة و في آن واحد، مع اعتبار العلاقات الحتمية التي تربطها و تجعل منها عنصرا متكاملة.

## APPROVAL PAGE

The thesis of Rouini Iman has been approved by the following:

---

Ismawi Hj.Zen  
Supervisor

---

Noor Hanita Abdul Majid  
Co Supervisor

---

Zuraini Denan  
Internal examiner

---

Dzul Haimi B. Hj. Md. Zain  
External examiner

---

Nasr Eldin Ibrahim Hussein  
Chairman

## DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Rouini Iman

Signature .....Date.....

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

**DECLARATION OF COPYRIGHT AND  
AFFIRMATION OF FAIR USE OF UNPUBLISHED  
RESEARCH**

Copyright © 2009 by Iman Rouini. All rights reserved.

**AESTHETICS IN ISLAM: THE LANGUAGE OF FORMS AND VISUAL  
COMFORT IN MUSLIM CONTEXT'S BUILDINGS, MOROCCO AND  
ANDALUSIA CASE STUDY**

No part of this unpublished research may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without prior written permission of the copyright holder except as provided below.

1. Any material contained in or derived from this unpublished research may only be used by others in their writing with due acknowledgement.
2. IIUM or its library will have the right to make and transmit copies (print or electronic) for institutional and academic purposes.
3. The IIUM library will have the right to make, store in a retrieval system and supply copies of this unpublished research if requested by other universities and research libraries.

Affirmed by Iman Rouini

.....  
Signature

.....  
Date

## ACKNOWLEDGEMENTS

In the name of Allah, the Most Beneficent and the Most Merciful

Praise be to Allah the Almighty, the Most Beloved, the Cherisher and Sustainer of the world, the Most Gracious and the Most Merciful.

Grace and gratitude are due to a number of people who have helped me throughout completing this thesis. First, I would like to thank my supervisor Prof. Dr Ismawi Haji Zen and my co-supervisor Dr. Noor Hanita Bt Abdul Majid for their patience, trust, motivation and concern to make this thesis a valuable reference in Islamic design.

My appreciation goes to all the lecturers and staff in the Kulliyah of Architecture and Environmental Design, especially, Assoc. Prof. Dr Maisarah, Assoc. Prof Dr Spahic Omer, Asst Prof. Dr. Zaiton AbdulRahim, Assoc. Prof. Ar. Dr. Asiah AbdulRahim and Asst. Prof. Dr. Puteri Shireen Jahn Kassim, for their help and valuable advices.

My thanks also go to Mr Hajjami and Prof. Bouayad who cared to equip me with Islamic knowledge regarding architecture and Urbanism.

I have a very high regard to Mr Serghini, the director of ADER-Fez, and to all the architects, engineers and technicians who had cooperated with me in the core process of this research.

I extend my thanks to the Ministry of Islamic Affaires and the Ministry of Culture for the facilities rendered to me so that I can undertake my fieldwork in Morocco.

I could not find proper words to articulate my gratitude and love to my parents for their endless care, attention and sacrifice.

Deepest thanks to my beloved husband, for his abundant love, support and care. Only Allah can give best rewards. My sincere appreciation goes to my sister and brothers, to my whole family for their enduring encouragements and understanding. To my friend a big thanks for their valuable friendship.

# TABLE OF CONTENTS

Abstract .....	ii
Abstract In Arabic .....	iii
Approval Page .....	iv
Declaration Page.....	v
Copyright Page.....	vi
Acknowledgment.....	vii
Tables of content .....	viii
List of Tables.....	xiv
List of Figures .....	xvi
Glossary .....	xxvi
<b>CHAPTER1: GENERAL INTRODUCTION .....</b>	<b>1</b>
1.0 Background.....	1
1.1 Research Problem Statement.....	2
1.1.1 Introduction .....	2
1.1.2 Growing Needs and Absence of an Appropriate Process.....	4
1.1.3 Tradition and Modernity.....	5
1.1.4 The Decline of the Ethic of Sustainable Development in Muslim Communities of the 20 <sup>th</sup> Century .....	6
1.1.5 Writings Relevant to Muslim Design .....	8
1.2 Research Questions.....	11
1.3 Aim of the Study.....	11
1.4 Objectives of the Study .....	12
1.5 Methods.....	12
1.6 Scope of the Thesis and Limitation of the Study.....	13
1.7 Significance of the Study .....	14
1.8 Organisation of the Thesis.....	14
1.9 Conclusion.....	16
<b>CHAPTER 2: THE UNIVERSAL AESTHETICS PERCEPTIONS .....</b>	<b>18</b>
2.0 Introduction .....	18
2.1 Ancient and Modern Aesthetic Perceptions around the World.....	19
2.1.1 Civilisation Perceptions on Aesthetics.....	20
2.1.1.1 African Perception.....	20
2.1.1.2 Asian Perception .....	20
2.1.1.3 Indian Perception.....	21
2.1.1.4 Aztec Perception .....	21
2.1.1.5 Islamic Perception.....	22
2.1.1.6 European Perception.....	23
2.1.2 Philosopher’s Perceptions on Aesthetic .....	23
2.1.2.1 The Aesthetic Moment .....	23
2.1.2.2 The Medieval Times.....	24
2.1.2.3 Eighteenth Century Thoughts .....	25
2.1.2.4 Muslim Philosophers’ Thoughts on Aesthetics .....	26
2.2 The Language of Forms .....	28



2.2.1 Form Construction .....	28
2.2.2 Analytical Thinking .....	30
2.2.3 Harmony .....	31
2.3 Visual Comfort .....	31
2.3.1 Visual Experience .....	31
2.3.2 Visual Capacity .....	31
2.3.3 Visual Paradigm .....	32
2.3.4 Visual Comfort in Buildings .....	32
2.4 Conclusion .....	33

**CHAPTER 3: THE DIFFERENT INTERPRETATIONS OF ISLAMIC AESTHETICS ..... 38**

3.0 Introduction .....	38
3.1 Muslims Interpretation of Islamic Aesthetics.....	38
3.1.1 General Approach: The Sense of Unity .....	38
3.1.2 Beauty and Aesthetics in the Holy Qur'ān.....	42
3.1.2.1 The Words Expressing Beauty in Qur'ān.....	43
3.1.2.2 Beauty and Functionality in Qur'ān.....	46
3.1.3 Ḥadīth of The Prophet Muhammad Peace and Blessing Be upon Him And Aesthetics .....	47
3.1.3.1 The First Group of Scholars' Arguments .....	47
3.1.3.2 The Second Group of Scholars' Arguments .....	49
i Exceptions Regarding The Nature And Quality Of The Artwork Object.....	49
ii Exceptions Regarding The Intention.....	50
iii Exceptions Regarding The Use of The Artwork Object .....	51
3.2 Some Interpretations of Muslim Designs.....	52
3.2.1 The Stifled Desire of Visualisation.....	54
3.2.2 A Word on the Inward .....	57
3.3 The Meaning of Innovation in Islamic Design.....	58
3.3.1 The Art .....	58
3.3.2 Innovation.....	58
3.3.3 The Notion of Universality and Global Vision .....	59
3.4 Studies on Islamic Arts and Architecture, Occidental Perception.....	60
3.4.1 The Orientalist Interpretations .....	61
3.4.2 The Occidental Use of Design Forms That Are Specific to Muslim World .....	62
3.5 Conclusion .....	64

**CHAPTER 4: THE HISTORY OF CHANGES IN DESIGN WITHIN ISLAMIC CONTEXTS ..... 70**

4.0 Introduction .....	70
4.1 Buildings and design appraisal .....	72
4.1.1 Architecture.....	72
4.1.1.1 Early Construction.....	72
4.1.1.2 The Umayyad Period.....	73
i The Dome of the Rock .....	74
ii The Umayyad Mosque .....	75
4.1.1.3 Spain (Andalusia).....	76

4.1.1.4 Iran and Central Asia.....	78
i The Mosque of Quwwat al-Islam.....	80
ii The Mosque of Guangzhou .....	84
4.1.1.5 Africa.....	85
i The great Mosque of Qairawan.....	86
ii Timbuktu Mosque .....	86
4.1.1.6 Iraq.....	87
i Samarra Minaret.....	87
ii. Abū Dulāf Mosque .....	88
iii. Ibn Tulūn Mosque .....	89
4.1.2 Ornament.....	89
4.1.2.1 Umayyad Period.....	89
4.1.2.2 Abbasid Period .....	92
4.1.2.3 Ghaznavid and Seljuk.....	95
4.1.2.4 The Mongol Period.....	96
4.1.2.5 Persian Period .....	98
4.2 Analysis and Discussion .....	105
4.2.1 The Technical Point of View.....	105
4.2.1.1 Design Modifications Made to Convert Non-Muslim Architectures. ....	105
4.2.1.2 The Nature and The Background Knowledge of New Convert Artisans or Non Muslim Artisan Who Worked for Muslim Leaders.....	107
4.2.1.3 Traditional Local Design Techniques .....	108
i Byzantine (Semi-Naturalistic Patterns).....	109
ii Persia (Plans, Dome, Brick).....	109
iii Ghazni (Aesthetic Joined To Functionality).....	110
iv China (Naturalistic Looking Patterns).....	110
4.2.1.4 The Nature and Quality of Local Construction and Design Materials. ....	110
4.2.1.5 Imported Design Models .....	111
4.2.1.6 Innovated Design Models. ....	112
4.2.2 The Political Point of View .....	113
4.2.2.1 Prophet’s Attitudes:.....	113
4.2.2.2 ‘Umar b. al-Khattāb Attitudes: .....	115
4.2.2.3 ‘Umar b. ‘Abd al-‘Azīz Attitudes .....	115
4.3 Conclusion.....	115

**CHAPTER 5: CONTEMPORARY MUSLIM ARCHITECTS AND THE UNDERSTANDING OF THE AESTHETIC FRAMEWORK IN MUSLIM BUILDINGS .....** **118**

5.0 Introduction .....	118
5.1 Farid al-Chafii.....	119
5.2 Muaath al-Alusi .....	121
5.3 Hassan Fathy .....	122
5.4 Abd al-Wahid al-Wakil.....	124
5.5 Mohammed Saleh Makiyah.....	124
5.6 Racim Badran .....	127
5.2 Conclusion.....	129

<b>CHAPTER 6: OUTLINE OF THE RESEARCH METHODOLOGY.....</b>	<b>133</b>
6.0 Introduction .....	133
6.1 Methodologies in Studies on Aesthetic Framework In Buildings.....	133
6.2 Research Methods and Procedures .....	135
6.2.1 Building Evaluation .....	136
6.2.1.1 The Descriptive Study .....	136
i Building Classification .....	136
ii Building Description .....	137
iii History .....	137
iv Evaluation .....	137
6.2.1.2 Desk Survey.....	138
i Archive Exploration .....	138
ii First Mapping.....	139
6.2.1.3 Sampling Procedure .....	140
6.2.1.4 Case Study .....	143
i Database Creation .....	145
ii Analytical Review of Drawings.....	145
iii Field Survey.....	146
iv In-Depth Interview .....	147
6.2.2 Perception Survey.....	148
6.2.2.1 Questionnaire .....	148
i Pilot test .....	150
ii Analysis of Data From Pilot Test.....	150
iii Refinement of Survey Method Questionnaires And Criteria for Respondents.....	152
6.2.2.2 Survey Mapping .....	153
6.2.2.3 Population and Sampling Procedure .....	154
6.2.2.4 Survey Interview .....	154
6.2.2.5 Site Observation .....	155
6.2.3 Data Limitation.....	155
6.2.4 Analysis of Data .....	156
6.3 Conclusion.....	158
<b>CHAPTER 7: CASE STUDY FINDINGS AND DISCUSSIONS .....</b>	<b>159</b>
7.0 Introduction .....	159
7.1 Definition of buildings categories.....	159
7.1.1 Muslim Buildings .....	159
7.1.2 The Mosque.....	160
7.1.3 The Palace .....	161
7.1.4 Houses.....	162
7.1.5 The Madrasa .....	163
7.1.6 The Market and Commercial Shops .....	163
7.2 Building Evaluation .....	163
7.2.1 The mosque.....	164
7.2.1.1 Buildings Plans and Evolution Description .....	164
7.2.1.2 Buildings Analysis .....	173
i General Morphology .....	174
ii The Prayer hall.....	174

iii The Minaret .....	176
iv The Courtyard .....	176
7.2.1.3 Buildings Design Constants and Variables.....	176
i The Constants.....	176
ii The Variables.....	176
7.2.2 The Madrasa .....	184
7.2.2.1 Buildings Plans Description.....	184
7.2.2.2 Buildings Analysis .....	190
i General Morphology .....	190
ii The Prayer Room .....	191
iii The Courtyard.....	191
iv Student Rooms .....	194
7.2.2.3 Buildings Design Constants and variables .....	196
7.2.3 The Market ( <i>Sūq</i> ).....	196
7.2.3.1 Buildings Plans Description.....	196
7.2.3.2 Buildings Analysis .....	199
7.2.3.3 Buildings Design Constants and Variables.....	200
7.2.4 Houses and palaces .....	202
7.2.4.1 Buildings Plans Description.....	202
i Transition Art.....	202
ii Framing Art.....	205
iii Privacy and Intimacy.....	208
iv Ornament, Solid and Void, Materials and Textures.....	209
7.2.4.2 Buildings Analysis .....	211
7.2.3.2 Buildings Design Constants and Variables.....	211
7.3 Perception Survey.....	212
7.3.1 General Background of the Respondents.....	213
7.3.1.1 Sample Characteristics .....	213
7.3.1.2 Gender and Age.....	213
7.3.1.3 Education and Economic Background .....	213
7.3.1.4 Period of Residency.....	214
7.3.2 The Concept of Aesthetic and Visual Comfort As Perceived by The Population of Madina Fez .....	214
7.3.2.1 Definition of the Building Elements Affecting Visual Comfort.....	215
i. Definition of the Building Aesthetic in the Context of Madina Fez.....	215
ii. Definition of the Building Elements Affecting Visual Comfort.....	216
7.3.2.2 The Preferences and Priorities Regarding Traditional Building Elements .....	217
7.3.3 Definition of the Attributes of Visual Comfort .....	218
7.3.4 Evaluating People’s Awareness on The Technical Functionality of The Aesthetic Elements.....	221
7.3.5 Testing the Sustainability of the Aesthetic Traditional Elements.....	222
7.4 Summary of Findings.....	224
7.4.1 Buildings Evaluation Summary.....	225
7.4.2 Summary of the Perception Survey .....	228

7.5 Conclusion .....	230
<b>CHAPTER 8: CONCLUSION AND RECOMMANDATION .....</b>	<b>237</b>
8.1 Introduction.....	237
8.2 Findings Summary and Discussion .....	237
8.2.1 Standards of Aesthetic and Aesthetic Perception .....	237
8.2.2 The Meaning of Islamic Aesthetic in Buildings.....	239
8.2.3 The Principal Aesthetic Components of Muslim Buildings .....	240
8.2.4 The Design Elements That Affect Visual Comfort in Muslim Traditional Buildings.....	242
8.2.5 Conclusion.....	244
8.3 Recommendation.....	245
8.3.1 The Ethics of Innovation.....	245
8.3.2 Conditions for the Innovator’s Qualities.....	246
8.3.3 Conditions for the Innovator’s Act.....	247
8.4 Significance of the Study.....	247
8.5 Direction for Future Researches.....	250
<b>BIBLIOGRAPHY.....</b>	<b>251</b>
APPENDIX I QUESTIONNAIRE, PERCEPTION SURVEY .....	257
APPENDIX II RESEARCH RECAP .....	261

## LIST OF TABLES

Table No.		Page No.
4.1	Summary of the principal changes occurring in ornament made from the review of Muslim masterpieces	103
5.1	Showing the use of traditional aesthetic building elements in the work of contemporary Muslim architects	131
6.1	Buildings Sampling 1	141
6.2	Buildings Sampling 2	145
6.3	Card for field survey	146
7.1	Al-Qairawiyyin Mosque Description	165
7.2	Al-Andalus Mosque Description	167
7.3	Bujlūd Mosque Description	168
7.4	Bab Al-Gisa Description	169
7.5	Shrabliyyīn Mosque Description	170
7.6	Ras ‘Ain Azliten Mosque Description	171
7.7	The Great Mosque Description	172
7.8	Mulay ‘Abd Allah Mosque Description	173
7.9	Mosque Prayer Hall	175
7.10	Mosque Minaret	177
7.11	Mosque Courtyard	178
7.12	Mosque <i>Mihrāb</i> and ‘ <i>anza</i>	183
7.13	Al-Bū‘ināniyyah <i>Madrassa</i> Description	185
7.14	Al-‘Attārin <i>Madrassa</i> Description	187
7.15	Saffārīn <i>Madrassa</i> Description	188
7.16	Sahrīj <i>Madrassa</i> Description	189
7.17	Sharrātīn <i>Madrassa</i> Description	190
7.18	<i>Madrassa Mihrāb</i>	192
7.19	<i>Madrassa</i> Courtyard	193
7.20	<i>Madrassa</i> Student Area	195
7.21	Shamma‘īn Souq Description	197

7.22	Tellīs Soūq Description	198
7.23	‘Attārīn Soūq Description	199
7.24	Markets	201
7.25	Transition Art Description, Dār Dmana	203
7.26	Transition art Description, Dār Al-azraq and Dār Mzelja	204
7.27	Framing Art Description, the Courtyard, Dār Al-Azraq	205
7.28	Framing Art Description, the Fountain, Dār Bensa‘id and Dār Benjellūn	206
7.29	Framing Art Description, Doors and Windows, Dār Benjellun	207
7.30	Privacy and Intimacy Description, Dar Al-Azraq	208
7.31	Ornament, Solid and Void, Material and Textures Description, Dār ‘adiyel	209
7.32	Definition of the Building Aesthetic in the Context of Madina Fez	216
7.33	Definition of the Building Elements Affecting Visual Comfort	217
7.34	The Preferences and Priorities Regarding Traditional Building Elements	218
7.35	Attributes of Visual Comfort	219
7.36	Constants and Variables of the Aesthetic Framework of Muslim Buildings	225

## LIST OF FIGURES

<u>Figure No.</u>		<u>Page No.</u>
1.1	Diagram of the Research Fields of Study, Objectives and Research Method	13
4.1	Ka'ba musharrafah, internal view Makkah, Saudi Arabia	73
4.2	Ka'ba musharrafaf floor	73
4.3	Prophet's Mosque, peace be upon him, Madinah, Saudi Arabia, 7th century	73
4.4	The great Mosque of kūfah floor plan Iraq, 7th century	73
4.5	Dome of the Rock, Al-aqsa mosque, Alquds, 7th century	74
4.6	Umayyad Mosque, Damascus, Syria, 8th century	76
4.7	Alhambra, Grenada, Spain, 13th, 14th, 16th centuries	76
4.8	Great Mosque of Cordoba, Spain, 9th, 10th, 16th centuries	77
4.9	Great Mosque of Cordoba, Interior view of the Maqsurah	77
4.10	Umayyad Mosque, interior view of haram	78
4.11	Inside Dome of the Rock	78
4.12	Kalyan Minaret, Bukhara, Uzbekistan, 12th century	79
4.13	Detail of columns decorated with stone carving, Quwwat al-Islam Mosque complex (Qutb complex), Delhi, India, 12th, 14th centuries	81
4.14	Detail of corner junction showing the decorated columns and trabeated construction, Quwwat al-Islam Mosque complex (Qutb complex), Delhi,	81



	India, 12th, 14th centuries	
4.15	Detail of columns decorated with stone carving, Qutb complex	81
4.16	Detail of human figure carving in the columns of the Qutb Mosque	81
4.17	Details of arabesques, kufic, scripts, niche and geometric patterns adorning the qibla wall, Qutb complex	83
4.18	Detail of the kufic and Tughra scripts and carvings on the qiblah wall, Qutb complex	83
4.19	Detail of the Nakshi scripts and floral carvings on qibla wall of Aybak's Mosque, Qutb complex	83
4.20	Exterior view of Alai Darwaza and the Qutb Minaret from the south, Qutb complex	84
4.21	Great mosque of Guangzhou, China, 7th century	85
4.22	The Great Mosque of al-Kairouan, Tunis, 9th century	86
4.23	Timbuktu Mali, 14th century	87
4.24	Great Mosque of Samarra, 9th century	88
4.25	Minaret of Samarra Mosque	88
4.26	Abu Dulāf Mosque, view of the spiral minaret from the Mosque, Samarra, 9th century	89
4.27	Ibn Tulūn Mosque, detail of the minaret, seen through an arch, Cairo, Egypt, 9th century	89
4.28	Mosaic, Umayyad Mosque, 8th century	90
4.29	Detail of floral motif mosaic decoration the cupola of the rock, 7th century	90
4.30	Decorative courtyard arcade, Aljaferia palace, Zaragoza, Spain, 11th, 12th centuries.	92
4.31	Carved stucco ornament, Attarin Madrasa, fez, Morocco, 14th century	92

4.32	Geometrical zellig decoration	92
4.33	Plate from Nishapur, Iran, 9th century, Abbassid period	93
4.34	Slip-painted glazed dish from Nishapur, Iran, 10th century, Abbassid period	93
4.35	Slip-painted bowl from Nishapur, Iran, 10th century, the Samanids	94
4.36	Kufic script	94
4.37	Naskhi script	94
4.38	Thuluth script	95
4.39	Ta”liq script	95
4.40	Diwani script	95
4.41	Stucco relief from rayy, turkish style, late 12th century, the Seljuks	96
4.42	Ceramic bowl of the minai type from kashaan, Iran, 12th century, the Seljuks	96
4.43	Bahram Gur’s Battle with the dragon, from the shah-nama ferdowsi, Tabriz, late 14th century, the Mongols	97
4.44	Khusraw at Shirin’s palace, from a khamsah by Nezami. Turkoman, Tabriz, late 15th century, the Timurids	97
4.45	Kalila wa Dimna, herat, 15th century	99
4.46	Safavid fresco(oil paint on plaster), by Muhammad zaman or his atelier, Isfahan, second half of 17th century	99
4.47	Women by fountain. By ‘ali Quli Bayg Jabbar, Isfahan, 17th century, Safavids	99
4.48	Kubachi earthenware dish with polychrome design of a dancer and a musician, North-west Iran 17th century	99

4.49	Karim khan Zand and his kinsmen, by Muhammad Sadiq, Shiraz, 18th century, Zand&Qajar Periods	100
4.50	Portrait of Fath ‘ali Shah, by Mihr ‘ali, 19th century, Zand&Qajar Periods	101
4.51	Portrait of Muzaffar al-Din shah and Premier ‘abd al-majid Mirza, ‘An al-Dawleh’, by ‘Abd al-Husayn, Tehran, early 20th century	101
4.52	Marble fountain in Ottoman baroque style, Topkapi palace, Istanbul, 15th century, Ottomans	102
4.53	Fountain in Dolmabahce palace, Istanbul, Turkey, 19th century	102
4.54	Topkapi palace	102
4.55	Dolmabahce palace Istanbul, Turkey, 19th century	102
5.1	The great theatre in berlin. Roof in stalactite, a similarity with the Muqarnas	120
5.2	The Olympic stadium in rome, similarity with the dome	120
5.3	Kuliyah Mosque in Riyad. The form of the dome reminds a Bedouin tent	121
5.4	The use of some decorative elements in big scale, like the form of the window in the above façade	121
5.5	Some essays to extract the Usūl and Mayasīn using the plans and facades of historical Muslim constructions	122
5.6	A. Mu‘ath’s sketch of a mosque. The structural system and the search of some architectural forms were prior to the search of visual comfort inside the prayer room	122
5.7	Village of new Gournā The use of Mulqaf and domes	123
5.8	The Qā‘ah of Muhibuddine Muskat in Oman.	123

	The use of courtyards, iwan (peripheral seating place) and qā'ah (wide central reception area)	
5.9	The Cornich mosque in. The type of the structural system used affected negatively visual comfort in the prayer room. the masses of structural elements blokes the vision towards the Mihrāb Jaddah	124
5.10	Halawa belajmi house, Aga khan award for architecture. Separation between the family and private spaces (the concept of salamlak and haramlak in Islamic architectural conception), the use of courtyard, mastabah, and many other traditional architectural elements	124
5.11	Comparison between the minaret of Baghdad state Mosque and historical minarets such as Samarra, Ibn Tulun and Qutub minaret	125
5.12	The Kuwait State Mosque. The wall by unit, where the wall is considered as a volume to enclose a three dimensional space with a normal two-dimensional wall	126
5.13	Comparison between Baghdad state mosque and great historical Mosques such us Sulayman, Samarra and Ibn Tulun Mosques	127
5.14	Baghdad State Mosque	127
5.15	The interior of a house designed by Racim Badran	128
5.16	The interior of a house designed by Racim Badran	128
5.17	Gradual Use of Aesthetic Component in Building by Muslim Contemporary Architects	130
6.1	Historical Evolution of Medina Fez	144
6.2	The Building Elements Affecting Visual Comfort	147
6.3	Population Sampling for the Indepth Interview	148
6.4	Population Sampling for the Questionnaire	154
6.5	Horizontal and Vertical approach	157

7.1	Al-Qairawiyyin Courtyard	165
7.2	Al-Qairawiyyin Plan	166
7.3	Al-Qairawiyyin Section	166
7.4	Al-Andalus Plan	167
7.5	Al-Andalus Section	167
7.6	Bujlūd Plan	168
7.7	Bujlūd Section	168
7.8	Bab Al-Gisa Plan	169
7.9	Bab Al-Gisa Section	169
7.10	Shrabliyyīn Plan	170
7.11	Shrabliyyīn Section	170
7.12	Ras ‘Ain Azliten Minaret	171
7.13	Ras ‘Ain Azliten Plan	171
7.14	The Great Mosque Plan	172
7.15	The Great Mosque Section	172
7.16	Mulay ‘Abd Allah Minaret Plan	173
7.17	Mulay ‘Abd Allah Minaret	173
7.18	Mulay ‘Abd Allah Mosque Plan	173
7.19	Al-qairawiyyin Prayer Hall	175
7.20	Al-Andalus prayer Hall	175
7.21	Bab al-Gīsa Prayer Hall	175
7.22	Bujlūd Prayer Hall	175
7.23	Shrabliyyīn Prayer Hall	175
7.24	Ras ‘Ain Azliten Prayer Hall	175

7.25	The Great Mosque Prayer Hall	175
7.26	Mulay ‘abd Allah Prayer Hall	175
7.27	Al-Qairawiyin Minaret	177
7.28	Al-Andalus Minaret	177
7.29	Bab al-Gīsa Courtyard	177
7.30	Bujlūd Minaret	177
7.31	Shrabliyyīn Minaret	177
7.32	Ras ‘Ain Azliten Minaret	177
7.33	The Great Mosque	177
7.34	Mulay ‘abd Allah Minaret	177
7.35	Al-Qairawiyin Courtyard	178
7.36	Al-Andalus Courtyard	178
7.37	Bab Al-Gīsa Courtyard	178
7.38	Bujlūd Courtyard	178
7.39	Chrabliyyīn Courtyard	178
7.40	Ras ‘Ain Azliten Courtyard	178
7.41	The Great Mosque Courtyard	178
7.42	Al-Qairawiyīn Mihrāb	183
7.43	‘Ain Azliten Mihrāb	183
7.44	A High Ornamented Band in the Top of the Mihrāb Niche, Bujlūd Mosque	183
7.45	Al-Qairawiyīn ‘Anza	183
7.46	The Great Mosque ‘Anza	183
7.47	Ornament in the Mihrāb Roof, Bujlūd Mosque	183
7.48	Al-Bu‘ināniyyah Plan, First Floor	185
7.49	Al-Bu‘ināniyyah Plan Second Floor	185

7.50	Al-Bu‘ināniyyah Entrance Door	185
7.51	Al-Bu‘ināniyyah section	186
7.52	Al-‘Attārīn Plan and Section	187
7.53	Al-‘Attārīn Sections	187
7.54	Saffārīn Plan, First Floor	188
7.55	Saffārīn Plan, Second Floor	188
7.56	Saffārīn Sections	188
7.57	Sahrīj Plan and Section	189
7.58	Sahrīj Courtyard	189
7.59	Sharrātīn Plan, Second and Third Floor	190
7.60	Sharrātīn Terrace Plan and Section	190
7.61	Sharrātīn Mihrab	192
7.62	The Sharrātīn Mihrab Niche	192
7.63	The Sharrātīn Mihrab Walls	192
7.64	The Sharrātīn mihrab Dome	192
7.65	Sharrātīn Courtyard	193
7.66	Al-Bū‘ināniyyah Courtyard	193
7.67	Sahrīj Courtyard	193
7.68	The Student Hostel	195
7.69	Student Room	195
7.70	Courtyard Roof	195
7.71	Market Plans Models	197
7.72	Market Shops Arrangement Models	198
7.73	‘Attārīn Soūq Plan, Cluster of Shops	199

7.74	Soūq Tellīs ( Carpets Market)	201
7.75	‘Attārīn Market	201
7.76	Shemmā‘īn Market	201
7.77	Dār Dmāna Section	203
7.78	Dār Dmāna Plan	203
7.79	Dār al-Azraq Section	204
7.80	Dār Mjelja Section	204
7.81	Dār al-Azraq Fountain Plan	205
7.82	Dār al-Azraq Patio,Terrace Plan	205
7.83	Dār Bensa‘id Section, Fountain in Burtāl	206
7.84	Dār Benjellūn Section, Fountain in wall	206
7.85	Dār Benjellūn Section, Internal Door	207
7.86	Dār Benjellūn Window	207
7.87	Dār al-Azrak Section, Principal and Secondary Houses	208
7.88	Dār ‘Adiyel Structure	209
7.89	Dār ‘Adiyel, Inside the House	210
7.90	Invariable Values and Variable manifestations in Muslim Design	212
7.91	Chart showing the Attributes of Visual comfort of Architectural Elemnts	219
7.92	Chart Showing the Attributes of Visual Comfort of Ornamental Elements	220
7.93	Diagram of the Principal Constants Regarding Conception	233
7.94	Diagram of the Principal Variables Regarding Conception	234
7.95	The Square of Constants and the Square of Variables Forming the Octagon of Innovation in	236