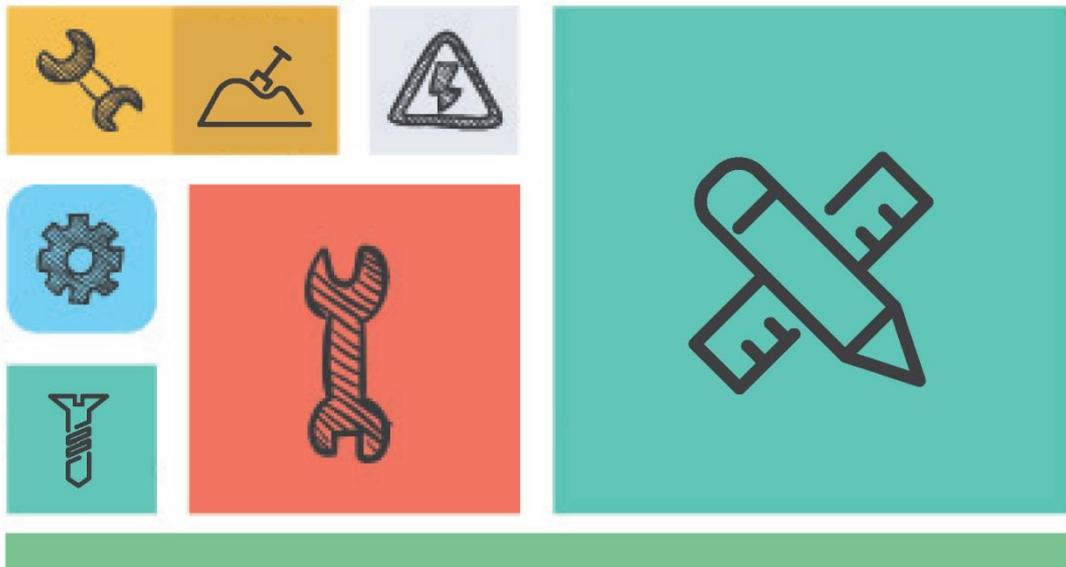# Architectural Exam

Architectural Professional Standards

Foreword

The quality of services and care of the communities are the primary interests of the profession of architecture. In most parts of the world, there are organizations under different names (unions, institutes, councils or associations) that are responsible for setting the local standards of professionalism in architectural practice in their communities.

Currently, the licensing for professional practice in Saudi Arabia is granted to architectural firms, who according to their license and level of expertise maybe awarded a consultancy rank within the **Saudi classification system** of the engineering/architectural practice.

Architects from other countries seeking jobs in Saudi Arabia are normally beyond the authority of Saudi accreditation bodies to ensure the validity of their education or credentials. Therefore, taking an exam to discern the **qualification** of prospective foreign architects becomes a necessary step towards quality control of architectural practice in Saudi Arabia.

"Qiyas" the client for this study, intends to produce a collective examination for job applicants seeking professional licensure to practice as architects according to the Saudi classification system. Furthermore, Qiyas is concerned with the issue of educating, preparing and validating individual architects through a comprehensive examination. The outcome of the process should ensure that incoming architects have gained a valid **education** demonstrated by authentic certification.

This exam is required from both architects graduating from local architectural programs, as well as from holders of architectural bachelor degrees from other countries, who want to be licensed to practice as architects in Saudi Arabia.

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Chapter 1

Review of International Practices

1.1. Introduction

Professional services are rapidly increasing and architects are regularly serving communities other than their own. To meet the need for international standard of professionalism in architectural practice; the International Union of Architects (UIA) was founded. Most of the local professional organizations followed in a way or another the UIA accord on recommended international standards of professionalism in architectural practice. The accord emphasizes both the quality of architectural education and architectural practice. The application of such recommended international standards is obvious in the examples of practices discussed below.

1.2. Comparative Analysis of International and Local Practices

The following is a comparative demonstration among the three architectural practices; the United Kingdom practice, the United States of America practice, and the Kingdom of Saudi Arabia practice. Bearing in mind that the educational systems in China (NBAA) and South Korea (KAAB) are emerging and will therefore be thoroughly considered in the next version.

1.2.1. The United Kingdom Practice

Education has always been central to the Royal Institute of British Architects (RIBA) and, parallel to the practice of architecture, is the cornerstone of the original 1834 Royal Charter. The RIBA examinations in architecture were established in 1863. In 1882, successful completion of these examinations became compulsory for architects seeking membership of the Institute. The RIBA procedures ensure the qualities of the profession as follows:

☐ A graduate should hold RIBA validated qualifications at part 1 and part 2, or equivalent international qualifications,

☐ Complete 24 months of practical experience under the direct supervision of a professional architect working in the construction industry,

☐ Obtain RIBA Part 3 qualification, i.e. the Advanced Diploma in Professional Practice in Architecture**.** The RIBA qualification is administered in the North West office of the RIBA and is a residential course based at the University of Chester.

A candidate who has gained Parts 1, 2 and 3 qualifications can register as an architect with the Architects Registration Board (ARB). The title 'architect' is protected by law, so that the public can always be sure that they are dealing with a properly qualified architect. At this point, an architect is eligible to become a Chartered Member of the RIBA.

1.2.2. The United States of America Practice

Unlike the United Kingdom, there are two different organizations in the United States of America. The first is The National Architectural Accreditation Board (NAAB), which is responsible for the accreditation of academic programs offered by schools of architecture. The second is the National Council of Architectural Registration Boards (NCARB), which is responsible for the processes of architects' licensing.

The NCARB licensing procedure is as follows:

☐ Earn a professional degree from a NAAB accredited school,

☐ Achieve the requirements of the Intern Development Program (IDP), which was created jointly by the NCARB and the American Institute of Architects (AIA), which includes practical experience for two years or so under the direct supervision of a registered architect,[1]

☐ Pass the Architect Registration Examination (ARE), which assesses candidates for their knowledge, skills, and ability to provide the various services required in the practice of architecture. The ARE Exam has been adopted for architects licensing by all 54 U.S. Member Boards and the Canadian

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[1] The (IDP) program is undergoing a change to be named Architectural Experience Program (AXP) since June 2016. The outcomes of this change shall be considered in the next version.

provincial and territorial architectural associations as a registration examination required for architectural registration.

1.2.3. The Saudi Arabian Practice

It is important to know that the Saudi professional classification system permits new graduates to hold the title 'architect' immediately after graduation and earning a 5-year bachelor degree in architecture.

The licensed architect in the USA, as well as the chartered architect in The UK, both are equivalent to the "professional architect" within the Saudi classification system of the Saudi Council of Engineers (see Figure 1)

The Saudi case is different in the sense that the academic accreditation for the departments of architecture is not required yet for the registration at the Saudi Council of Engineers. However, the accreditation process started a few years ago; and was conducted by the National Commission for Academic Accreditation and Assessment (NCAAA). There is also the example of the Department of Architecture and Building Science at King Saud University, which has managed to earn a NAAB substantial equivalency accreditation.

The registration at the Saudi Council of Engineers is required for all engineering graduates as well as architects in order to be recognized as practitioners. Gaining experience and fulfilling a set of specified qualifications, registered architects will be promoted to a higher rank as follows:

☐ Architect (a graduate of a 5-year program),
☐ Associate Architect (min. of 4 years of experience),
☐ Professional Architect (min. of 9 years of experience),
☐ Consultant Architect (min. of 19 years of experience).

The interaction between the architectural education and practice is shown in Figure (1).
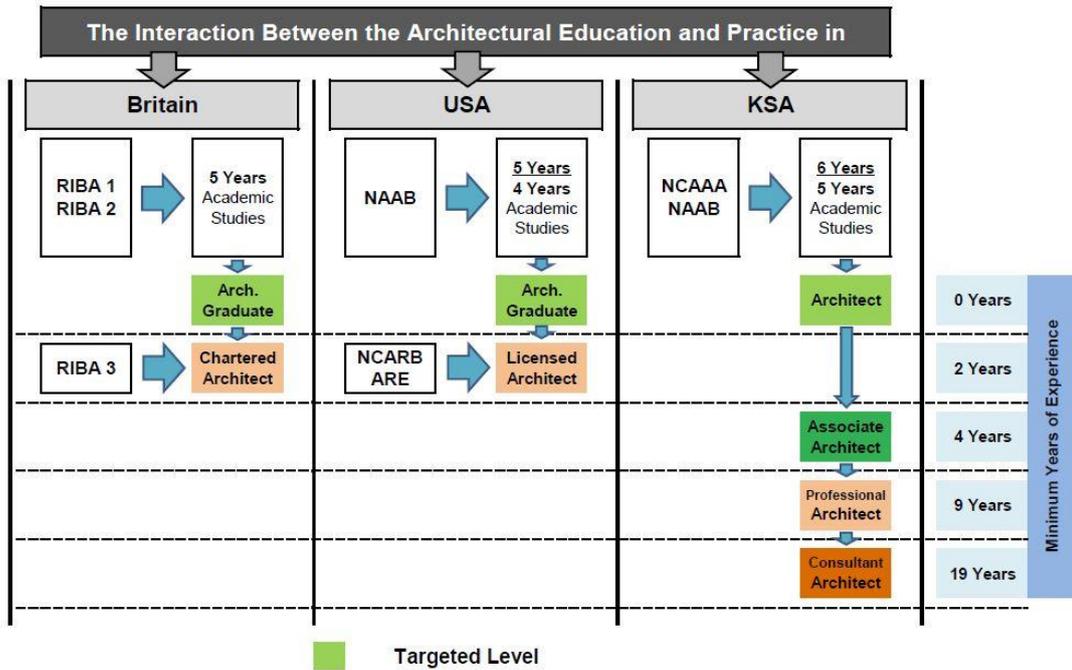
Figure 1: Interaction between the architectural education and practice in the United Kingdom, the United States of America, and the Kingdom of Saudi Arabia

1.3. The International Case Studies

Following are three cases for analysis, which are the most well-known practices throughout the world, and thus resemble a good reference for benchmarking and benefiting from their long experience. The three cases are: the Royal Institute of British Architects (RIBA), the National Council of Architectural Registration Boards (NCARB), and The International Union of Architects (Union International des Architects or UIA):

1.3.1. The Royal Institute of British Architects[2]

The Royal Institute of British Architects (RIBA) has a long tradition in validating architectural programs, and overseeing the growth of architects professionally in the United Kingdom. The RIBA also validates architectural programs and individual practices in the commonwealth countries that adopt the UK educational and practice systems. The RIBA has organized the

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[2] https://www.architecture.com/RIBA/Becomeanarchitect/Becominganarchitect.aspx

process of educational learning and professional growth of individual architects into three parts:

- [ ] Part 1,
- [ ] Part 2, and
- [ ] Part 3.

RIBA Part 1 and 2

Part 1 and 2 can be achieved by attending a valid architectural program by the RIBA for three and four years of study consecutively. At least one year of practice in the field of architecture should be spent outside the university to gain the two parts combined. In order for architects to achieve Part 1 and/or Part 2, the architectural educational programs should reflect educational and professional standards known as "the general criteria" (see Appendix A) of the report titled: "the RIBA procedures for validation and validation criteria for UK and international courses and examinations in architecture." the report was authored by the RIBA Education Department on 25 July 2011. The general criteria amount to a list of 11 general criteria, each of which is explained by three sub-criteria. In brief, the topics of these criteria read as:

- [ ] Architectural Design
- [ ] History and Theory of Architecture
- [ ] Fine Arts
- [ ] Urban Design and Planning
- [ ] Building and Environment
- [ ] Profession of Architecture
- [ ] Method of Investigation
- [ ] Structural Design
- [ ] Functions of Buildings
- [ ] Cost Factors and Building Regulations
- [ ] Industries and Organizations

The RIBA differentiates between the architects who have achieved Part 1 or Part 2 by sets of "graduate attributes." The graduate attributes for Part 1

are mainly based on the educational processes which adopt abilities to generate, apply, understand, evaluate, and identify architectural and design concepts and issues.

Part 2 graduate attributes, however, expect an architect to excel into more advanced realms of learning such as the ability to critically understand, test, analyze, integrate, solve problems, and make decisions.

RIBA Part 3

In setting the standards to gain the Part 3, the RIBA shifts the focus from educational validation as requirements to professional practice conformation. The RIBA sets out a process by which an architect could gain counted practical experience and associated knowledge in five main areas referred to by the RIBA as "professional criteria" at Part 3. The main focus of each of the five criteria is as follows:

☐ Criterion 1: Professionalism
☐ Criterion 2: Clients, users, and delivery of services
☐ Criterion 3: Legal framework and processes
☐ Criterion 4: Practice and management
☐ Criterion 5: Building procurement

The overall RIBA's procedural requirement for Part 3 constitutes the following:

☐ Successfully obtained validated qualifications at Part 1 and Part 2
☐ Completed a minimum of 24 months in professional practice continuously
☐ Mandatory attendance of an examination preparation short course of full three weeks
☐ Successfully pass a written examination taken over the span of three days
☐ Successfully pass an interview at the end of Part 3 validation procedure.

The previous outline of the RIBA validation procedure can suggest certain lessons:

☐ The validation is concerned with two main sections: educational and professional. This does not mean that one section cannot contain elements from the other. An architect can get most of the skills he or she needed through educational curricula

☐ The validation procedure for school programs inside the UK for Part 1 and Part 2 can automatically validate an architect

☐ The validation process for Part 3 is unique for each architect adhering to his or her own professional practice and circumstances, and therefore cannot be applied universally to all applicants.

To reflect the UK experience on the case at hand in the Kingdom of Saudi Arabia, Part 1 and Part 2 validation examination and their criteria are most related to this study, which are knowledge-oriented, and intended for new entrants to the profession in the Saudi architectural market. Part 3 as it is uniquely designed for each candidate, and is intended to match professional experience of the candidate to the local context of the UK, cannot be used to achieve the Qiyas objectives at this stage.

1.3.2. The National Council of Architectural Registration Boards[3]

The beginning of the National Council of Architectural Registration Boards (NCARB) was in May 1919, when a group of 15 American architects joined in a meeting during the convention of the American Institute of Architects (AIA) and created the organization known today as the National Council of Architectural Registration Boards (NCARB).

The members of the National Council of Architectural Registration Boards (NCARB) are the architectural registration boards from the 50 states,

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[3] http://www.ncarb.org/

in addition to the District of Columbia, as well as the U.S. territories of Guam, Puerto Rico, and the U.S. Virgin Islands.

The National Council of Architectural Registration Boards (NCARB) administers many programs, most conspicuously are the Architect Registration Examination (ARE) and the Intern Development Program (IDP).

The NCARB also leads the regulation of the architectural practice by means of the development and application of standards for architects' licensure and credentialing. It also provides Member Boards with the qualification process for architects' registration.

The NCARB achieves these goals by developing and recommending the standards that an applicant for registration as a licensed architect must meet, as well as standards for the regulation of the architectural practice.

Characteristics

The NCARB administers its Architect Registration Examination (ARE) only once a year, to assess the graduates of architectural schools accredited by the NAAB in their knowledge, skills, and their capability of providing a variety of services essential to the architectural practice.

ARE covers seven areas of specialty in which licensed architects must demonstrate their capabilities. These areas are:

☐ **Programming, Planning and Practice**

a) Programming and analysis
b) Environmental, social and economic issues
c) Codes and regulations
d) Project and practice management

☐ **Construction Documents and Services**

a) Codes and regulations
b) Environmental issues
c) Construction drawings and project manual
d) Project and practice management

☐ **Site Planning and Design**

a) Principles

b) Environmental issues

c) Codes and regulations

d) Materials and technology

e) Project and practice management

☐ **Schematic Design**

a) Interior layout

b) Building layout

☐ **Structural Systems**

a) General structures

b) Seismic forces

c) Wind forces

d) Lateral forces

☐ **Building Systems**

a) Codes and regulations

b) Environmental issues

c) Plumbing

d) HVAC

e) Electrical

f) Lighting

g) Specialties

Advantages and Disadvantages

One of the main objectives of ARE is to ensure that the practice of architecture is performed as an integrated whole. Therefore, it focuses on the services that affect the public health, safety, and welfare the most.

The ARE seeks to examine the candidate's qualifications in performing various measurable tasks, in addition to measuring the skills and judgment an architect needs when working with numerous specialists.

A fundamental concern for the ARE is its conformity with the architectural practice, by relating its contents to the actual tasks that an architects would encounter within the daily realties of the practice of architecture.

Moreover, ARE is not the only measure of architects' competency, and thus it is only one of the required steps towards the licensing of an architect to become professionally registered.

The 50 states, in addition to the District of Columbia, as well as the U.S. territories of Guam, Puerto Rico, and the U.S. Virgin Islands are responsible for setting the requirements of their own education, experience, and examination

The NCARB Licensing Procedure

To be a licensed architect according to the NCARB, prospective architects must accomplish the following:

☐ Earn a professional degree from a NAAB accredited school.
☐ Acquire experience under the direct supervision of a registered architect.
☐ Pass the Architect Registration Examination.

Applicability of the NCARB Licensing system in Saudi Arabia

There are some similarities between the two systems followed in the US and in Saudi Arabia, most notably the requirement of obtaining a professional degree in architecture from an accredited school. The NCAAA is the national accreditation body authorized to accredit schools in Saudi Arabia.

Nevertheless, there are no requirements for any training period or experience before an architectural school graduate may practice as an architect in Saudi Arabia.

1.3.3. The Union of International Architects[4]

The International Union of Architects (Union International des Architects or UIA) was founded in 1948 to unite the architects in a federation of their national organizations. The UIA now represents some 1,300,000 architects in more than 100 countries.

The UIA established the Professional Practice Commission (PPC) and approved its program in 1994. The PPC is the author of "The UIA Accord on International Standards of Professionalism in Architectural Practice". The Commission has devoted nine years of intensive study and debate to develop the accord. The Accord contains a statement of principles of professionalism and a series of 16 policy issues in a format of definitions and background statements followed by policy statements. These documents were presented to the UIA Congress and Assembly in Beijing, China in July 1999. This was a historic achievement - it is the first time the profession of architecture had adopted a global standard. Updates by the Commission, approved by the Council, and through the Assembly have been implemented since that time.

The UIA Standards have been extracted from the UIA report titled "Accord on Recommended International Standards of Professionalism in Architectural Practice". This report has determined the fundamental requirements for licensing the architects; these requirements refer to the knowledge, skills, and abilities that must be mastered through recognized education and training, and demonstrable knowledge, capability, and experience in order to be considered professionally qualified to practice architecture. These standards adopted by its professional practice commission in 1999, published in December 2006, and amended in August 2014.

Nowadays, architects are not limited to the boundaries of their own countries when providing services. Either working from their home base,

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[4] http://www.google.com.sa/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwi 7wNKf8fnLAhXHLQ8KHWw1AC8QFgggMAA&url=http%3A%2F%2Fwww.uia.archi%2Fsites%2Fdefault %2Ffiles%2FAIAS075164.pdf&usg=AFQjCNGoIBo2pGrVR3u7GPrguyz6mEFcYw

associating with a foreign fellow architect or opening an office abroad, international practice has become a consequence of the globalized economy.

The UIA Professional Practice Commission prepared the standards of professionalism in architectural practice to be a global guide that can be used by governments and architectural organizations in the promotion of the global mobility of architects, as it will unify the standards of professional practice worldwide. The Accord is the result of the co-operative effort of the international community of architects to objectively establish standards and practices that will best serve community interests.

UIA Accord has presented a comprehensive vision and recommendations for all practices related to architectural education and profession, for example; the Fundamental Requirements of an Architect, the standards of architectural education, the procedures of academic accreditation for architectural schools and profession validation for architects, the scope and form of the architectural practice, intellectual and copyright issues related to architecture, the role of Professional Institutes of Architects. Consequently, The UIA Accord on International Standards of Professionalism in Architectural Practice in general is a very rich reference, and particularly it is important to the associations which are concerned with establishing standards and examinations for professional practice in architecture.

In August 1985, for the first time, a group of countries came together to set down the fundamental knowledge and abilities of an architect. In 2014, the most recent published edition of the UIA accord has included 16 standards containing the following subjects:

1) Architectural Designs
2) History and Theories
3) Fine arts
4) Urban design and planning
5) People and Buildings
6) Profession of Architecture
7) Methods of Investigation
8) Structural design

9)   Function of buildings and comfort

10) Cost factors and building regulations

11) Industries and Organizations

12) Environmental values, as well as Architectural Heritage

13) Sustainable design and rehabilitation

14) Building techniques and construction methods related to architecture

15) Project Financing and management.

16) Training and Architectural Learning[5]

Advantages and Disadvantages

☐ The UIA Accord on International Standards of Professionalism in Architectural Practice in general is a very rich reference, and particularly it is important to the associations which are concerned with establishing standards and examinations for professional practice in architecture.

☐ The UIA report did not mention the priority and relative weight of each standard in relation to the others.

☐ The UIA report classified the capabilities of the architect into three categories, as this to some extent indicates the importance and relative weight of each capability:

  ❖ Design: refers to the design skills.

  ❖ Knowledge: refers to the awareness and understanding.

  ❖ Skills: refers to general skills.

☐ The UIA standards have some duplications in the skills included in them, for example, standards 6 and 7. This repetition might be avoided when preparing the indicators for each standard. Moreover, some standards are general and require further explanation such as standard 10.

☐ The UIA report shows a special concern about the following issues:

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[5] For more information, see Appendix C.

❖ Responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.

❖ Sustainability, conservation and rehabilitation of built environments.

❖ Creative competence in building techniques.

❖ Financial aspects, cost control and project management.

❖ Research as an important learning strategy in architecture.

☐ Finally, the UIA standards might be utilized as a guide or a prototype for generating the local standards in the Kingdom of Saudi Arabia for architects as intended by Qiyas.

1.4. Conclusion

Finally, it is possible to note that there are similarities in one way or another among the three organizations. However, both the Royal Institute of British Architects (RIBA), and The National Council of Architectural Registration Boards (NCARB) respond mainly to the national factors influencing the practice in UK and USA respectively. Whereas the International Union of Architects (UIA), by its nature, has the advantage of an expanded scope that responds considerably to the international requirements of the architectural professional practice. The membership of more than 100 countries obviously reflects the global trend of UIA towards overseeing the application of criteria for the professionalism in architectural practice.

The UIA accord is comprehensive, and covers a wide range of topics that include most of the relevant topics found in the RIBA and the NCARB accords. It is more of an amalgam that combines both accords. The expanded scope has allowed the UIA to be applicable worldwide more than any other accord for the validation of professionalism in architectural practice.

Moreover, the Saudi Council of Engineers (which has a chapter for architecture and another for architectural heritage) has been a member of the UIA since 2009.

The UIA report classified the capabilities of the architect into three categories:

☐ Design: refers to the design skills

☐ Knowledge: refers to the awareness and understanding

☐ Skills: refers to general skills

In addition, the UIA accord focuses mainly on the following issues:

☐ Responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage

☐ Sustainability, conservation and rehabilitation of built environments

☐ Creative competence in building techniques

☐ Financial aspects, cost control and project management.

☐ Research as an important learning strategy in architecture.

Accordingly, and for the justifications mentioned above, the accord of the International Union of Architects (UIA), shall be considered as the fundamental reference for developing the Saudi standards and validation criteria for architects.

Chapter 2

Exploration of Professional Standards:
A Perspective from the Saudi Architectural Practice

2.1. Introduction

It is especially important to gauge the degree of conformity between the professional standards adopted by the UIA with the viewpoint of the architectural practitioners in Saudi Arabia. Such significance becomes even greater as that matter relates to the architects' qualification obtained from overseas before the professional authorities (i.e., the Saudi Council of Engineers) approve their licensure and grant them permission to work in the local market of the architectural profession in Saudi Arabia.

For that purpose, a survey form was prepared to be used as a questionnaire sent to a group of practitioners, and to be discussed as well with a group of academics in a thematic interview.

The survey included questions representing three categories:

☐ **Knowledge**

To maintain and advance knowledge of the art and science of architecture, and to respect the body of architectural accomplishment.

☐ **General skills**

To be able to collaborate and communicate with others, and to evaluate schemes and proposals.

☐ **Design skills**

To employ three-dimensional imagination, creative thinking and judgment, and innovation, and to provide design leadership.

The questions were organized in no specific order within the survey itself. The survey included 32 questions, 16 of which were the UIA standards, but were dispersed among the other standards, so respondents would react without any biases favoring or disfavoring these 16 standards per se.

Afterwards, a focus group was held to discuss the UIA standards and their applicability in the Saudi architectural profession.

The survey was designed so as to give respondents the choice to select the most appropriate answer that match their viewpoint with respect to the standards being evaluated. The choices were given in a five-point scale including: (very important, important, fair, unimportant, and vey unimportant). In order to transfer these responses into numerical format, they were given corresponding values of importance ranging from (5 to 1) respectively, following the same order.[6]

2.2. Questionnaire

For the purposes stated above, a questionnaire was prepared, and was sent by email to a group of (35) candidate respondents, representing the following four categories of practitioners in Saudi Arabia:

☐ Experienced, practicing architects,

☐ Heads of architectural firms or top officials in these firms,

☐ Architects supervising the project departments in ministries or other governmental offices, and

☐ Academics who have rich experience in the practice, as either consultants or part-time practitioners.

The number of returned forms was (15), representing a percentage of (43%) of the total number of the outgoing forms, which were used in the forthcoming analysis.[7]

The respondents perceived the highest values of importance to:

☐ The "design skills" were ranked the highest, with an average of 65.67 points (87.56%),

☐ The "general skills" scored an average of 58.67 points (78.23%),

☐ The "knowledge" scored an average of 58.04 points (77.39%),

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[6] See Appendix D.

[7] It is quite obvious that the number of participants in the questionnaire was relatively small, yet targeting a larger sample could have been rather perplexing. The high level of experience of the targeted participants compelled the size of the sample to be practically small. Allocating more time could have generated more returned forms, but time limitation was very pressing. Nevertheless, the other two techniques (thematic interview and focus group) helped overcome such drawback.

☐ The UIA standards scored an average of 60.47 points, (80.63%),

☐ The overall average was 59.56 points (79.41%).

The numbers above are a potentially robust indication that the respondents value "design skills" more importantly than "general skills" or "knowledge", when evaluating an architect's candidacy to professional practice.

It is also obvious from the participants' responses that they have been much more concerned with the practical aspects of an architect's competence, rather than the theoretical aspects or even academic knowledge. A possible explanation of that trend is that they view design skills as a culmination of the other skills (i.e., general skills and knowledge) that architectural students receive via their education at the institutions from which they received their diplomas.

Nevertheless, the participants' responses show that the average points of the UIA standards was the second highest score, superseded only by "design skills" which practicing architects typically view as the most important skills an architect must acquire before joining the workforce in the architectural market.

It is quite reasonable that the UIA standards scored the second rank within the evaluative choices by professional practitioners in the Saudi local market, since these standards include a combination representing the three categories, (i.e., the design skills, the general skills, and knowledge).

The variations among the scores may not be very high, but are still difficult to describe as insignificant, because all of these choices are important in the first place, and the questionnaire was used only to discern if they were still perceived important by the professional practitioners in the local market.[8]

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[8] Nevertheless, the point that received the greatest score among the design skills was relevant to the definition of problems, analytical thinking, and critical judgment.

2.3. Thematic Interview

Similar to the questionnaire, an interview session was held in which six academics (all from the College of Architecture and Planning, King Saud University) were invited to participate in a discussion of the professional standards. They were asked, afterwards, to fill out the survey forms which were sent to the professionals.

- ☐ The "design skills" were ranked the highest, with an average of 25.2 points (84%),
- ☐ The "general skills" scored an average of 21.67 points (72.23%), equal to the average of the UIA standards.
- ☐ The "knowledge" scored an average of 20.46 points (68.20%),
- ☐ The overall average was 21.31 points (71.03%).

Similar to the responses provided by the practitioners for the questionnaire, the "design skills" was given the highest importance by the academics who participated in the thematic interview. The responses for this category show that there is conformity among practitioners and academics regarding the high importance of "design skills" for the approval of a candidate practicing architect in the Saudi Arabia professional architectural market.

The "general skills" came in the second rank, similar to the responses in the questionnaire, but was equal to the UIA standards.

Although the findings and interpretation of average values in the thematic interview are almost similar to the questionnaire, the increased value of the "general skills" to reach an equal average of the UIA standards could be indicative that academics pay more attention to the general skills that the practitioners. This is perhaps due to their contact with students and the realization of the importance of the other skills in helping students develop a more balanced personality as a future architect.

The "knowledge" was likewise ranked at the lowest level, although not very low when considering the relatively small variance between the average values given to the three categories mentioned above.

In a nutshell, the responses provided by the academics during the thematic interview were highly consistent with the responses given by the academics.

2.4. Focus Group

After conducting the first and second part of the participants' survey (i.e., the questionnaire and the thematic interview), the committee held a focus group at the Department of Architecture and Building Science, College of Architecture and Planning at King Saud University (KSU).

The objective of holding such event was to ensure the validity of the criteria on the one hand, and to listen to the critique of their appropriateness for testing the qualification of new architectural practitioners, on the other.

The committee invited a number of academics to participate in the focus group. Eight instructors responded to the invitation and showed up in the meeting. They represented a variety of disciplines as well as nationalities. Nevertheless, all of them had some practical experience, in addition to their academic career.

The participants in the focus group raised several issues for discussion, but were mostly around the following issues:

☐ Some UIA criteria combined several aspects that need to be considered independently, especially the ones that do not relate cohesively to one another from a topical point of view.

☐ There are many tracks that architects who graduated recently may specialize in throughout their practice as professionals. Therefore, the UIA criteria may not be inclusive of the various tracks, especially for site architects, quality control, safety assurance, etc.

☐ The number of questions in the form (32 questions) is large, and the time needed to respond to them is rather long.

☐ Aspects related to creativity (right side of the brain) may need to be considered at a different scale from the logical activities (left side of the brain) within the criteria.

□ The criteria seem too comprehensive for an individual architect to master. They are more likely to be covered by an architectural office that encompasses a group of architects, due to their multiple specialties.

2.5. Conclusion

From the above approaches to solicit the opinions of experts and practitioners, as well as academics, one may conclude that:

□ There has been a consensus among respondents that setting up an exam to ensure the qualification of architects before they are permitted to practice in Saudi Arabia.

□ The UIA professional standards are potentially suitable to frame the professional exam.

□ The professional exam should emphasize the basic skills that any architect must have. The exam must be comprehensive without going into the details, before being granted the official licensure of architectural practice.

□ The respondents ranked the "design skills" as the most important standards that an architect must attain.

□ The "UIA standards" were ranked the second most important.

□ The "general skills" came in the third rank, while the "knowledge" were ranked the least important.

Chapter 3

The Professional Standards

3.1. Introduction

Through studying the three cases included in this report (RIBA, NCARB and UIA), and after reviewing their standards for the profession of architecture and their validation systems, the committee has used the UIA standards as a reference for achieving two objectives. First, to extract the topics that are covered by the standards of UIA and will be used as a reference for establishing the architectural professional standards in the Kingdom of Saudi Arabia (as shown in Table 1). Second, to weigh these topics as a benchmark for determining the weight of the architectural professional standards in the Kingdom of Saudi Arabia.

3.2. The Methodology of Weighing the Topics

In order to achieve a logical methodology for weighing the sixteen topics that will be covered by the architectural professional standards in the Kingdom of Saudi Arabia, the committee decided to weight the UIA standards and to use these weights as a guide for weighing the topics and accordingly the architectural professional standards in the Kingdom of Saudi Arabia.

The weights of UIA standards have been measured according to three visions; firstly, the vision of the UIA (Union of International Architects), secondly, the vision of Royal Institute of British Architects (RIBA), and thirdly, the vision of the participants in the survey included in the second chapter of this report.

The NCARB system is focused on examining the candidates' knowledge and experience, and therefore did not suit the standards development stage. Nevertheless, the committee considered the NCARB system when formulating the sample questions of the proposed exam.

Table 1: The fundamental knowledge and abilities of an architect according to UIA standards

THE FUNDAMENTAL KNOWLEDGE AND ABILITIES OF AN ARCHITECT "According to UIA standards"	1	Ability to create architectural designs that satisfy both aesthetic and technical requirements, and which aim to be environmentally sustainable.	**Architectural Design**
	2	Adequate knowledge of the history and theories of architecture and related arts, technologies, and human sciences.	**History & Theory**
	3	Knowledge of the fine arts as an influence on the quality of architectural design.	**Fine Arts**
	4	Adequate knowledge of urban design, planning, and the skills involved in the planning process.	**Urban Design & Planning**
	5	Understanding of the relationship between people and buildings and between buildings and their environments, & of the need to relate buildings & the spaces between them to human needs & scale.	**Humanities**
	6	Understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors.	**Professional Practice**
	7	Understanding of the methods of investigation and preparation of the brief for a design project.	**Programming**
	8	Understanding of the structural design, construction, and engineering problems associated with building design.	**Structures & Construction**
	9	Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate.	**Building Systems**
	10	Design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations.	**Design Skills**
	11	Adequate knowledge of the industries, organizations, regulations, and procedures involved in translating design concepts into buildings and integrating plans into overall planning.	**Policies & Regulations**
	12	Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.	**Social Responsibility**
	13	Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.	**Sustainability**
	14	Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.	**Advanced Building Technologies**
	15	Adequate knowledge of project financing, project management, cost control and methods of project delivery.	**Economy**
	16	Training in research techniques as an inherent part of architectural learning, for both students and teachers.	**Self & continous learning**

3.2.1. Weights According to the UIA Vision

UIA sees the capabilities of the architect as a whole consists of three components; knowledge, general skills, and design skills. Therefore all the standards has been classified into three categories according to the UIA vision into knowledge and/or general skills and/or design skills that are covered by each standard (as shown in Table 2). This vision has been utilized for weighing the UIA standards, and the mathematical logic has been applied as follows:

- ☐ Architect Capabilities = Knowledge + General Skills + Design Skills

- ☐ 1 Architect Capabilities = 1/3 Knowledge + 1/3 General Skills + 1/3 Design Skills

- ☐ Design skills = Included in 3 standards = 1/3 X 1/3 = 1/9 for each standard

- ☐ General Skills = Included in 8 Standards = 1/3 x 1/8 = 1/24 for each standard

- ☐ Knowledge = Included in 13 standards = 1/3 x 1/13 = 1/39 for each standard

The final weights are represented in Figure 2.

Table 2: Categories and weights of standards according to the UIA vision

	Standard	Topic	UIA Category Design Skills	General Skills	Knowledge	Points	Percentage %
1	Ability to create architectural designs that satisfy both aesthetic and technical requirements, and which aim to be environmentally sustainable.	Architectural Design	0.11	0.04	0.03	0.18	17.8
2	Adequate knowledge of the history and theories of architecture and related arts, technologies, and human sciences.	History & Theory			0.03	0.03	2.6
3	Knowledge of the fine arts as an influence on the quality of architectural design.	Fine Arts			0.03	0.03	2.6
4	Adequate knowledge of urban design, planning, and the skills involved in the planning process.	Urban Design & Planning		0.04	0.03	0.07	6.7
5	Understanding of the relationship between people and buildings and between buildings and their environments, & of the need to relate buildings & the spaces between them to human needs & scale.	Humanities			0.03	0.03	2.6
6	Understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors.	Professional Practice		0.04	0.03	0.07	6.7
7	Understanding of the methods of investigation and preparation of the brief for a design project.	Programming		0.04	0.03	0.07	6.7
8	Understanding of the structural design, construction, and engineering problems associated with building design.	Structures & Construction			0.03	0.03	2.6
9	Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate.	Building Systems			0.03	0.03	2.6
10	Design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations.	Design Skills	0.11	0.04		0.15	15.3
11	Adequate knowledge of the industries, organizations, regulations, and procedures involved in translating design concepts into buildings and integrating plans into overall planning.	Policies & Regulations	0.11		0.03	0.14	13.7
12	Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.	Social Responsibility			0.03	0.03	2.6
13	Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.	Sustainability			0.03	0.03	2.6
14	Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.	Advanced Building Technologies		0.04		0.04	4.2
15	Adequate knowledge of project financing, project management, cost control and methods of project delivery.	Economy		0.04	0.03	0.07	6.7
16	Training in research techniques as an inherent part of architectural learning, for both students and teachers.	Self & continous learning		0.04		0.04	4.2
					Total	1.00	100

(Row label, vertical: THE FUNDAMENTAL KNOWLEDGE AND ABILITIES OF AN ARCHITECT "According to UIA standards")
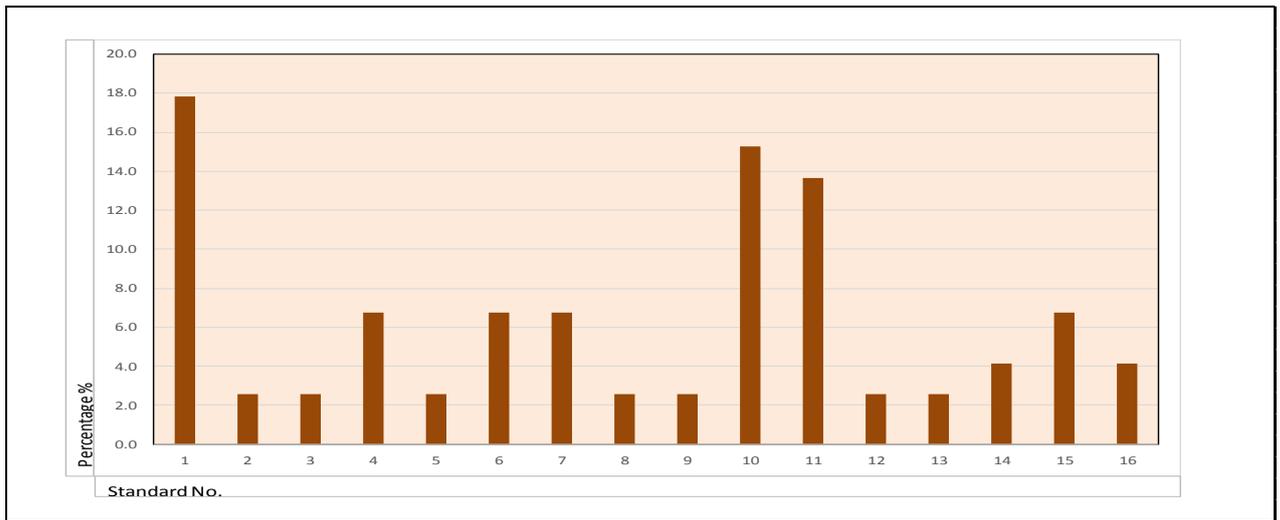
Figure 2: Analysis of weights according to the UIA vision

3.2.2. Weights According to the RIBA Vision

The RIBA sees the capabilities of an architect as a whole consisting of three components: Part 1, Part 2, and Part 3. All the standards, therefore, have been classified into three categories according to the RIBA vision, Part 1 standards and/or Part 2 standards and/or Part 3 standards that are included under each part (as shown in Table 3). This vision has been utilized for weighing the UIA standards, and the same mathematical logic has been applied as follows:

- ☐ Architect Capabilities = Part 1+ Part 2 + Part 3
- ☐ 1 Architect Capabilities = 1/3 Part 1+ 1/3 Part 2 + 1/3 Part 3
- ☐ Part 1= Covered by 11 standards = 1/3 X 1/11 = 1/33 for each standard
- ☐ Part 2 = Covered by 11 standards = 1/3 x 1/11 = 1/33 for each standard
- ☐ Part 3 = Covered by 5 standards = 1/3 x 1/5 = 1/15 for each standard

The final weights are represented in Figure 3.

Table 3: Categories and weights of standards according to the RIBA vision

			RIBA Category				
THE FUNDAMENTAL KNOWLEDGE AND ABILITIES OF AN ARCHITECT "According to UIA standards"		Standard	Topic	Part 1	Part 2	Part 3	Points	Percentage %
	1	Ability to create architectural designs that satisfy both aesthetic and technical requirements, and which aim to be environmentally sustainable.	**Architectural Design**	**0.03**	**0.03**		**0.06**	**6.1**
	2	Adequate knowledge of the history and theories of architecture and related arts, technologies, and human sciences.	**History & Theory**	**0.03**	**0.03**		**0.06**	**6.1**
	3	Knowledge of the fine arts as an influence on the quality of architectural design.	**Fine Arts**	**0.03**	**0.03**		**0.06**	**6.1**
	4	Adequate knowledge of urban design, planning, and the skills involved in the planning process.	**Urban Design & Planning**	**0.03**	**0.03**		**0.06**	**6.1**
	5	Understanding of the relationship between people and buildings and between buildings and their environments, & of the need to relate buildings & the spaces between them to human needs & scale.	**Humanities**	**0.03**	**0.03**		**0.06**	**6.1**
	6	Understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors.	**Professional Practice**	**0.03**	**0.03**		**0.06**	**6.1**
	7	Understanding of the methods of investigation and preparation of the brief for a design project.	**Programming**	**0.03**	**0.03**		**0.06**	**6.1**
	8	Understanding of the structural design, construction, and engineering problems associated with building design.	**Structures & Construction**	**0.03**	**0.03**		**0.06**	**6.1**
	9	Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate.	**Building Systems**	**0.03**	**0.03**		**0.06**	**6.1**
	10	Design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations.	**Design Skills**	**0.03**	**0.03**		**0.06**	**6.1**
	11	Adequate knowledge of the industries, organizations, regulations, and procedures involved in translating design concepts into buildings and integrating plans into overall planning.	**Policies & Regulations**	**0.03**	**0.03**		**0.06**	**6.1**
	12	Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.	**Social Responsibility**			**0.07**	**0.07**	**6.7**
	13	Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.	**Sustainability**			**0.07**	**0.07**	**6.7**
	14	Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.	**Advanced Building Technologies**			**0.07**	**0.07**	**6.7**
	15	Adequate knowledge of project financing, project management, cost control and methods of project delivery.	**Economy**			**0.07**	**0.07**	**6.7**
	16	Training in research techniques as an inherent part of architectural learning, for both students and teachers.	**Self & continous learning**			**0.07**	**0.07**	**6.7**
			Total				**1.00**	**100**
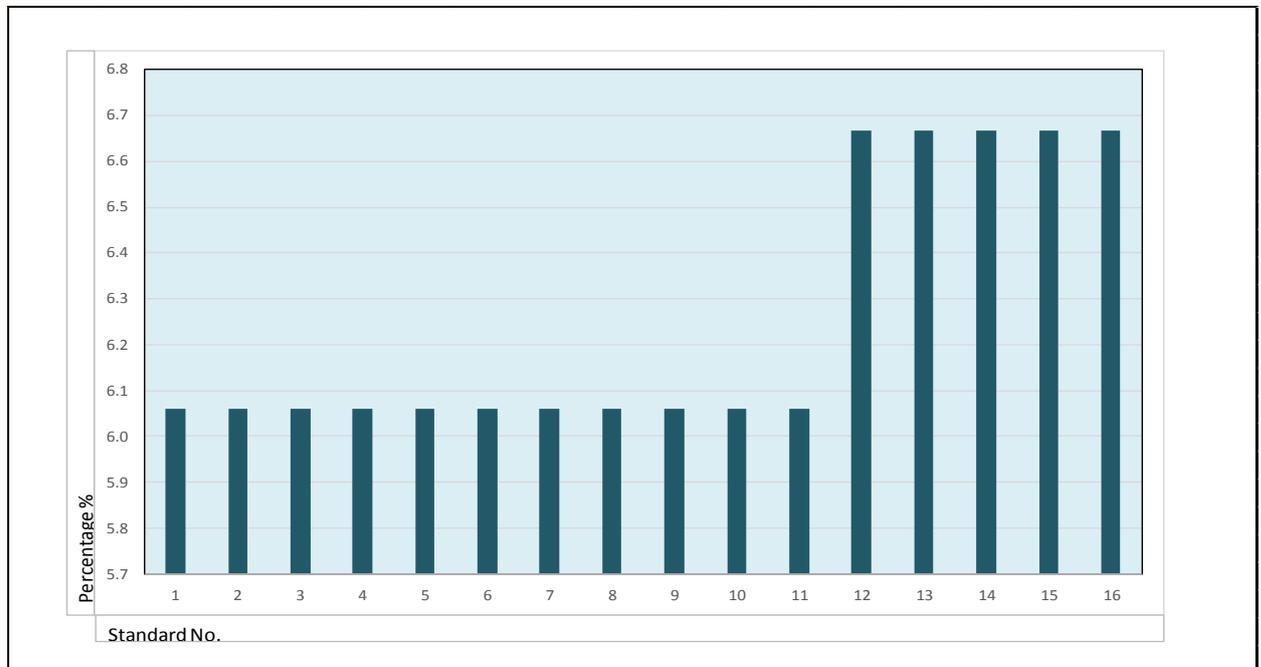
Figure 3: Weights according to the RIBA vision

3.2.3. Weights According to the Local Vision for the Architect

The local survey adopted the same vision of the UIA as it sees the capabilities of the architect as a whole consisting of three components; knowledge, general skills, and design skills. Therefore all the standards has been classified into three categories according to this local vision in KSA into knowledge and/or general skills and/or design skills that are covered by each standard (as shown in Table 4). This vision has been utilized for weighing the UIA standards, and the same mathematical logic has been applied, as follows:

☐ Architect Capabilities = Knowledge + General Skills + Design Skills

☐ 1 Architect Capabilities = 0.360 Knowledge + 0.325 General Skills + 0.315/3 Design Skills

☐ Design skills = Included in 3 standards = 1/3 X 1/3 = 1/9 for each standard

☐ General Skills = Included in 8 Standards = 1/3 x 1/8 = 1/24 for each standard

☐ Knowledge = Included in 13 standards = 1/3 x 1/13 = 1/39 for each standard

The final weights are represented in Figure 4.

Table 4: Categories and weights of standards according to the local vision in KSA

	Standard	Topic	Local Vision Categories			Points	Percentage %
			Design Skills	General Skills	Knowledge		
1	Ability to create architectural designs that satisfy both aesthetic and technical requirements, and which aim to be environmentally sustainable.	Architectural Design	0.12	0.04	0.024	0.18	18.4
2	Adequate knowledge of the history and theories of architecture and related arts, technologies, and human sciences.	History & Theory			0.024	0.02	2.4
3	Knowledge of the fine arts as an influence on the quality of architectural design.	Fine Arts			0.024	0.02	2.4
4	Adequate knowledge of urban design, planning, and the skills involved in the planning process.	Urban Design & Planning		0.04	0.024	0.06	6.4
5	Understanding of the relationship between people and buildings and between buildings and their environments, & of the need to relate buildings & the spaces between them to human needs & scale.	Humanities			0.024	0.02	2.4
6	Understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors.	Professional Practice		0.04	0.024	0.06	6.4
7	Understanding of the methods of investigation and preparation of the brief for a design project.	Programming		0.04	0.024	0.06	6.4
8	Understanding of the structural design, construction, and engineering problems associated with building design.	Structures & Construction			0.024	0.02	2.4
9	Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate.	Building Systems			0.024	0.02	2.4
10	Design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations.	Design Skills	0.12	0.04		0.16	16.0
11	Adequate knowledge of the industries, organizations, regulations, and procedures involved in translating design concepts into buildings and integrating plans into overall planning.	Policies & Regulations	0.12		0.024	0.14	14.4
12	Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.	Social Responsibility			0.024	0.02	2.4
13	Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.	Sustainability			0.024	0.02	2.4
14	Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.	Advanced Building Technologies		0.04		0.04	4.0
15	Adequate knowledge of project financing, project management, cost control and methods of project delivery.	Economy		0.04	0.024	0.07	6.5
16	Training in research techniques as an inherent part of architectural learning, for both students and teachers.	Self & continous learning		0.04		0.04	4.1
		Total				1.00	100

Row header (vertical): THE FUNDAMENTAL KNOWLEDGE AND ABILITIES OF AN ARCHITECT "According to UIA standards"
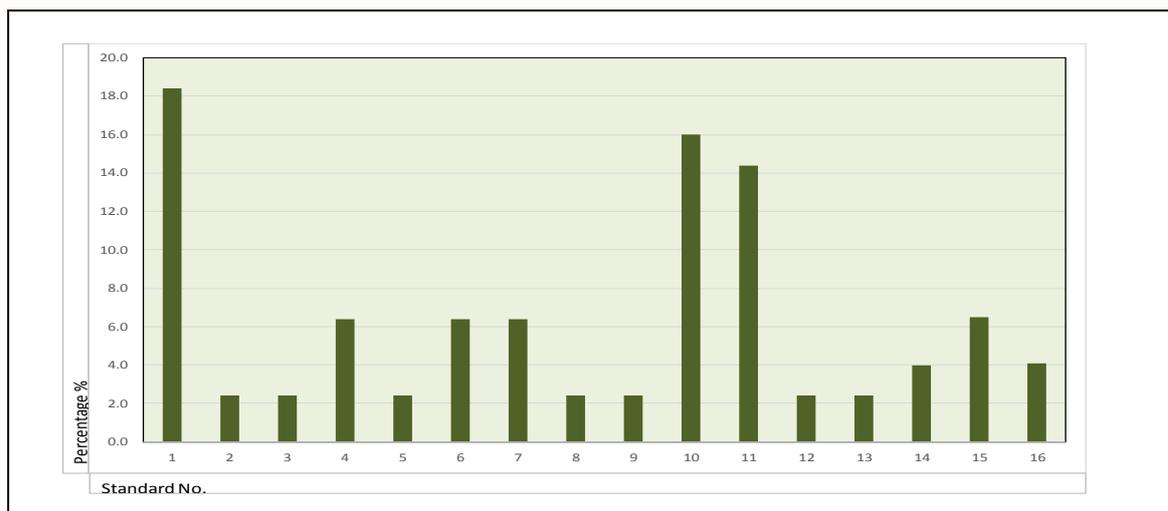
Figure 4: Categories and weights of standards according to the local vision in KSA
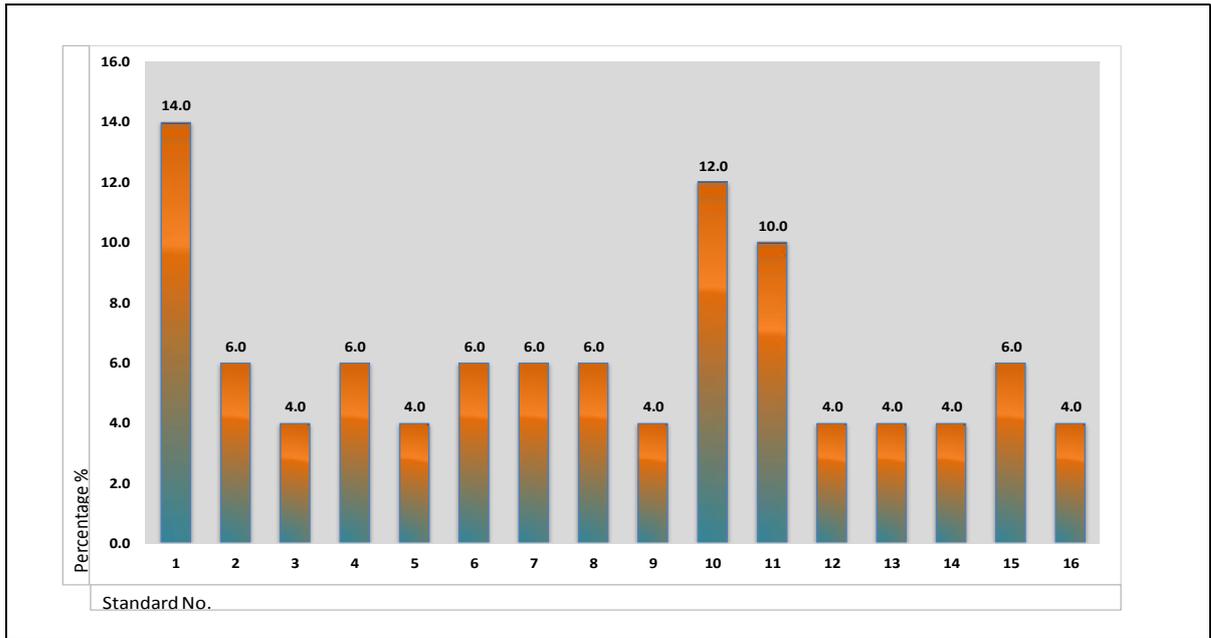
3.2.4. The Final Weights

The final weights have been calculated as an average value from the UIA, the RIBA, and the KSA, and were calibrated considering that all the weights have whole numbers with even values (as shown in Table 5 and Figure 5) to facilitate determining their equivalent number of questions in the final exam, whether it would be a 100-question or 50-question exam. Then the topics have been resorted according to their weight (as shown in Figure 6). The final ranking of standards has become obviously different from both the UIA and the RIBA. The main reason is the input given by the experts who participated in the local survey.

Table 5: The calculation and calibration of the final weights

		Standard	Topic	UIA	RIBA	Survey	Points	Percentage %	Weights % (Calibrated)
THE FUNDAMENTAL KNOWLEDGE AND ABILITIES OF AN ARCHITECT "According to UIA standards"	1	Ability to create architectural designs that satisfy both aesthetic and technical requirements, and which aim to be environmentally sustainable.	**Architectural Design**	0.178	0.061	0.184	0.14	14.1	14.0
	2	Adequate knowledge of the history and theories of architecture and related arts, technologies, and human sciences.	**History & Theory**	0.026	0.061	0.024	0.04	3.7	6.0
	3	Knowledge of the fine arts as an influence on the quality of architectural design.	**Fine Arts**	0.026	0.061	0.024	0.04	3.7	4.0
	4	Adequate knowledge of urban design, planning, and the skills involved in the planning process.	**Urban Design & Planning**	0.067	0.061	0.064	0.06	6.4	6.0
	5	Understanding of the relationship between people and buildings and between buildings and their environments, & of the need to relate buildings & the spaces between them to human needs & scale.	**Humanities**	0.026	0.061	0.024	0.04	3.7	4.0
	6	Understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors.	**Professional Practice**	0.067	0.061	0.064	0.06	6.4	6.0
	7	Understanding of the methods of investigation and preparation of the brief for a design project.	**Programming**	0.067	0.061	0.064	0.06	6.4	6.0
	8	Understanding of the structural design, construction, and engineering problems associated with building design.	**Structures & Construction**	0.026	0.061	0.024	0.04	3.7	6.0
	9	Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate.	**Building Systems**	0.026	0.061	0.024	0.04	3.7	4.0
	10	Design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations.	**Design Skills**	0.153	0.061	0.160	0.12	12.4	12.0
	11	Adequate knowledge of the industries, organizations, regulations, and procedures involved in translating design concepts into buildings and integrating plans into overall planning.	**Policies & Regulations**	0.137	0.061	0.144	0.11	11.4	10.0
	12	Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.	**Social Responsibility**	0.026	0.067	0.024	0.04	3.9	4.0
	13	Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.	**Sustainability**	0.026	0.067	0.024	0.04	3.9	4.0
	14	Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.	**Advanced Building Technologies**	0.042	0.067	0.040	0.05	4.9	4.0
	15	Adequate knowledge of project financing, project management, cost control and methods of project delivery.	**Project Management**	0.067	0.067	0.065	0.07	6.6	6.0
	16	Training in research techniques as an inherent part of architectural learning, for both students and teachers.	**Self & continous learning**	0.042	0.067	0.041	0.05	5.0	4.0
			Total				1.00	100	100

Figure 5: The final weights

OLD ORDER	Topic	NEW ORDER		Order	Topic	Weights %
1	Architectural Design	1		1	Architectural Design	14.0
2	History & Theory	5		2	Design Skills	12.0
3	Fine Arts	14		3	Policies & Regulations	10.0
4	Urban Design & Planning	7		4	Programming	6.0
5	Humanities	10		5	History & Theory	6.0
6	Professional Practice	8		6	Structures & Construction	6.0
7	Programming	4		7	Urban Design & Planning	6.0
8	Structures & Construction	6		8	Professional Practice	6.0
9	Building Systems	13		9	Project Management	6.0
10	Design Skills	2		10	Humanities	4.0
11	Policies & Regulations	3		11	Sustainability	4.0
12	Social Responsibility	12		12	Social Responsibility	4.0
13	Sustainability	11		13	Building Systems	4.0
14	Advanced Building Technologies	15		14	Fine Arts	4.0
15	Project Management	9		15	Advanced Building Technologies	4.0
16	Self & continous learning	16		16	Self & Continuous Learning	4.0

Figure 6: Re-sorting the topics according to their weights

3.3. The Architectural Professional Standards in Saudi Arabia

Topic T1	Architectural Design
Standard AR-T1	The architect should be able to develop designs that can meet both functional requirements and aesthetical values
Weight	14 %

Topic T2	Design Skills
Standard AR-T2	The architect should have acquired design skills that are needed to satisfy building user's requests within the limits set forth by cost factors and building rules and guidelines
Weight	12 %

Topic T3	Policies and Regulations
Standard AR-T3	The architect should have knowledge of the establishments related to building industries and their regulations. The architect should also be aware of the procedures linked to realizing design concepts into actual buildings, and assimilating plans into whole planning
Weight	10 %

Topic T4	Programming
Standard AR-T4	The architect should have an adequate knowledge of architectural programming, and possess the skills required to develop a project brief

Weight	6 %

Topic T5 — History and Theory

Standard AR-T5	The architect should have knowledge about history and theories of architecture

Weight	6 %

Topic T6 — Structures and Construction

Standard AR-T6	The architect should have adequate knowledge of construction methods and techniques as well as engineering systems related to buildings

Weight	6 %

Topic T7 — Urban Design and Planning

Standard AR-T7	The architect should have adequate knowledge in the fields of urban design and planning, and gain suitable knowledge of the skills associated with the planning process

Weight	6 %

Topic T8 — Professional Practice

Standard AR-T8	The architect is required to demonstrate an understanding of the profession of architecture, its related ethics, legal responsibilities, and impact on the society

Weight	6 %

Topic T9	Project Management
Standard AR-T9	The architect should have knowledge about design and construction management
Weight	6 %

Topic T10	Humanities
Standard AR-T10	The architect should understand how buildings relate to their surrounding environment and to the people using them, and how to consider the human scale and needs
Weight	4 %

Topic T11	Sustainability
Standard AR-T11	The architect should have gained satisfactory knowledge of the ways of realizing architectural designs that are ecologically sustainable, and responding to conservation and rehabilitation constraints
Weight	4 %

Topic T12	Social Responsibility
Standard AR-T12	The architect must be aware of the responsibilities regarding urban, architectural, and environmental values, along with their cultural, social, and human accountabilities, in addition to architectural heritage values
Weight	4 %

Topic T13	Building Systems

Standard AR-T13	The architect must be knowledgeable about the technologies that help overcome the physical problems that affect users' comfort with building interiors and protect buildings against climatic conditions
Weight	4 %

Topic T14 — Fine Arts

Standard AR-T14	The architect should have knowledge about fine arts and the theory of colors
Weight	4 %

Topic T15 — Advanced Building Technologies

Standard AR-T15	The architect is expected to be aware of the recent, innovative, and advanced building technologies related to the building design, construction, operation and maintenance
Weight	4 %

Topic T16 — Self and Continuous learning

Standard AR-T16	The architect is expected to have acquired the basic knowledge and training in research methods and techniques in order to maintain their capabilities in architectural learning
Weight	4 %

Chapter 4

The Indicators

4.1. Introduction

Professional standards are the sum of knowledge, abilities, and attributes required for professional practice. The "Indicators" are specific requirements extracted from a particular standard to be used as tools that measure the fulfillment of the corresponding standard. The process of developing the indicators related to the standards of the architectural profession is mainly dependent on the following resources.

4.2. The Team Members' Personal Experience

The team members have diverse backgrounds, and each of them has a different area of specialization. They all have a long experience in both academic and professional practice, and participated in the development of their departments' curricula and preparations for academic accreditation. (See Appendix E for detailed CVs for each member).

4.3. Questionnaire, Thematic Interviews, and Focus Group

The survey, both the questionnaire and the thematic interview, as well as the focus group, emphasized that candidate architects must be adequately capable of undertaking design tasks. Nevertheless, they must be skilled in a balanced way in the three categories of architectural competence (design skills, general skills, and knowledge).

It is rather necessary to consider the variations in the importance attributed to each of the issues of the professional standards. The development of indicators that measure with a higher degree of validity the relevance of each standard to the acquired competence must be in congruence with the overall viewpoint of the practitioners and academics, who participated in the survey.

The team members' experience, nevertheless, has evolved throughout several years of working within the accreditation committees for both the

National Architectural Accrediting Board (NAAB) and the National Commission for Assessment and Academic Accreditation (NCAAA). The members' input in the development of professional indicators assures the overall correspondence of the various aspects that could potentially affect the exam development and its validation.

4.4. KSU Department of Architecture and Building Science Curriculum

The Department of Architecture and Building Science at KSU is so far the only curriculum that has been accredited by the NAAB in Saudi Arabia. It encompasses 50 courses, distributed along 5 years of study.

The courses cover different subjects required for newly graduates to start practice as architects according to The Saudi Council of Engineers classification.

4.5. The NAAB Student Performance Criteria

The NAAB defined 33 criteria classified into three categories: Fundamental (15 criteria), Technical (14 criteria) and Practical (four criteria). These criteria aimed at setting the standards and the levels of learning outcomes expected of an architecture program. The NAAB process for the accreditation of the Department of Architecture and Building Science at KSU adopted its own criteria. Only minor changes are made to two of the criteria that are related to "National and Regional Traditions and Historical Traditions" considering the local culture.

4.6. The NCAAA Student Learning Outcomes

The NCAAA learning outcomes are classified into five categories; Knowledge; Cognitive Skills; Interpersonal Skills and Responsibilities; Communication, IT and Numerical Skills; Psychomotor Skills. For the purpose of accrediting the Department of Architecture and Building Science at KSU, the learning outcomes (LO) are defined and stated by the Department itself,

where the system of the NCAAA allows each department to formulate its own LOs.

4.7. Indicators associated with Standards

The architectural standards (defined in Chapter 3) are associated with the indicators shown in the following pages. The standards are coded AR-TJ, where:

- ☐ (AR) denotes "Architecture"
- ☐ (TJ) denotes "Topic Number"

Indicators are coded (AR- TJ – K), where K denotes the indicator number).

Topic T1	Architectural Design

Standard AR-T1	The architect should be able to develop designs that can meet both functional requirements and aesthetical values
Weight	14 %

Indicators

AR-T1-01	Create a functional space diagram (bubble diagram) for different types of buildings
AR-T1-02	Design a conceptual plan layout in response to specific requirements
AR-T1-03	Create alternative conceptual designs for a facade of a given plan
AR-T1-04	Distinguish the crucial issues influencing the design decisions in a design problem
AR-T1-05	Infer the effects of a room orientation on its environmental performance
AR-T1-06	Select a structure system that suit a concept design of a project
AR-T1-07	Apply codes and regulations related to design
AR-T1-08	Explain issues forced by local culture into a design
AR-T1-09	Apply issues related to safety and accessibility in design
AR-T1-10	Show understanding about design methods

Topic T2	Design Skills
Standard AR-T2	The architect should have acquired design skills that are needed to satisfy building user's requests within the limits set forth by cost factors and building rules and guidelines
Weight	12 %

Indicators	
AR-T2-01	Rank cost of design schemes
AR-T2-02	Calculate land development cost
AR-T2-03	Create design alternatives
AR-T2-04	Identify costly activities for given design schemes
AR-T2-05	Apply factors for efficient design of a given design problem
AR-T2-06	Describe a building design program
AR-T2-07	Name the steps and phases of value engineering
AR-T2-08	List the steps of economic feasibility study
AR-T2-09	Test a design program in terms of costs
AR-T2-10	Define design models

Topic T3	Policies and Regulations
Standard AR-T3	The architect should have knowledge of the establishments related to building industries and their regulations. The architect should also be aware of the procedures linked to realizing design concepts into actual buildings, and assimilating plans into whole planning
Weight	10%

Indicators	
AR-T3-01	Describe the role of the local design agencies in the planning process
AR-T3-02	Identify the local facility agencies which directly linked to building industry
AR-T3-03	Name the role of the private design office in the planning process
AR-T3-04	Arrange the design approval steps
AR-T3-05	Describe the role of building contractors in the planning process
AR-T3-06	Describe the components of building contracts
AR-T3-07	Identify the role of the architect in the implementation process of buildings
AR-T3-08	Apply feedback of planning audiences on planning process
AR-T3-09	Describe planning regulations
AR-T3-10	Describe the city master plan

Topic T4	Architectural Programming

Standard AR-T4	The architect should have an adequate knowledge of architectural programming, and possess the skills required to develop a project brief

Weight	6 %

Indicators	
AR-T4-01	Explain the methods of investigating the client's wants and needs
AR-T4-02	Illustrate a scenario for specific project activities
AR-T4-03	Apply a methodical site selection process
AR-T4-04	Evaluate the site characteristics
AR-T4-05	Analyze precedents and case studies
AR-T4-06	Assess the functional efficiency of a building
AR-T4-07	Estimate the total built area of a project
AR-T4-08	Prepare a building space program
AR-T4-09	Choose the appropriate materials, furniture and equipment for a project
AR-T4-10	Prepare a comprehensive space data sheet

Topic T5	History and Theories

Standard AR-T5	The architect should have knowledge about history and theories of architecture

Weight	6 %

Indicators	
AR-T5-01	Classify historical buildings
AR-T5-02	Relate historical architectural styles to their origins
AR-T5-03	Explain the natural, social and technological factors influencing a historical architecture
AR-T5-04	Infer the architectural characteristics of a historical building
AR-T5-05	Identify the structural qualities of a historical building
AR-T5-06	Describe the esthetical qualities of a historical building
AR-T5-07	Relate the principals of contemporary schools of thought employed in an architecture design concept
AR-T5-08	Associate buildings with the school of thought influencing their designs

Topic T6	Structures and Construction

Standard AR-T6	The architect should have adequate knowledge of construction methods and techniques as well as engineering systems related to buildings

Weight	6 %

Indicators	
AR-T6-01	Describe a contemporary construction method
AR-T6-02	Identify the characteristics of different building materials
AR-T6-03	Explain an architectural construction details
AR-T6-04	Choose the appropriate construction method(s) for a project
AR-T6-05	Compare among different structural systems
AR-T6-06	Estimate the dimensions for a structure
AR-T6-07	Select the structural system(s) for a building
AR-T6-08	Recognize the electrical and mechanical drawings
AR-T6-09	Apply basic surveying techniques
AR-T6-10	Prepare the Bills of Quantities (BOQs) for a project

Topic T7	Urban Design and Planning
Standard AR-T7	The architect should have adequate knowledge in the fields of urban design and planning, and gain suitable knowledge of the skills associated with the planning process
Weight	6 %
Indicators	
AR-T7-01	Calculate the floor area ratio (FAR) of a building site
AR-T7-02	Name the components of a street cross-section
AR-T7-03	Relate the design principles to building design
AR-T7-04	Connect land-use map colors key to urban activities
AR-T7-05	List the design components of a master plan
AR-T7-06	identify different types of Street Grid types
AR-T7-07	Calculate population density
AR-T7-08	Rank hierarchically master plan/ general/ city plan
AR-T7-09	Classify types of urban spaces: public, semi-public, semi-private, and private spaces
AR-T7-10	Calculate slope percentage of topography

Topic T8	Professional Practice
Standard AR-T8	The architect is required to demonstrate an understanding of the profession of architecture, its related ethics, legal responsibilities, and impact on the society
Weight	6 %
Indicators	
AR-T8-01	Describe the different options for the legal forms of architectural firms
AR-T8-02	Propose a project scope, goals and values
AR-T8-03	Compare among the different architectural professional services
AR-T8-04	Apply the standards of a specific architectural space
AR-T8-05	Recognize the impact of the architectural profession on society
AR-T8-06	Define the role of the architect in the society
AR-T8-07	Express the ethical and legal responsibilities of the architect
AR-T8-08	Utilize life-safety codes in building design and construction
AR-T8-09	Describe the benefits and limitations of the collaborative design process
AR-T8-10	Classify the factors that affect the real-estate marketplace

Topic T9	Project Management

Standard AR-T9	The architect should have knowledge about design and construction management

Weight	4 %

Indicators	
AR-T9-01	Describe the architect responsibilities as a consultant
AR-T9-02	Compare architecture tender drawings with bills of quantities
AR-T9-03	Arrange work plan and cash flow program for different project phases
AR-T9-04	Define financial issues (budgeting, cost estimate, cost monitoring, and variances)
AR-T9-05	Examine cost brake down of an item
AR-T9-06	Discover conflicts between architectural tender drawings with other disciplines drawings
AR-T9-07	Arrange a resource management plan
AR-T9-08	Differentiate contracting methods, such as; the itemized bill, the cost plus, the lump sum and the Built-Operate-Transfer (BOT) method

Topic T10	Humanities
Standard AR-T10	The architect should understand how buildings relate to their surrounding environment and to the people using them, and how to consider the human scale and needs
Weight	4 %
Indicators	
AR-T10-01	Describe the behavioral factors that affect the mutual relationship between people and buildings: e.g. privacy, personal space, crowding, territoriality
AR-T10-02	Apply the basic aspects of human comfort inside buildings.
AR-T10-03	Examine the safety requirements inside buildings and in their surroundings
AR-T10-04	Analyze spaces according to the hierarchy of: private, semi-private, semi-public, and public spaces in the design of buildings and their surroundings
AR-T10-05	Apply the built-area-ratio enacted by the regulations/ordinances, or recommended by the brief
AR-T10-06	Relate buildings to the green areas around them
AR-T10-07	Apply environmental principles that improve the social activities in outdoor spaces between buildings
AR-T10-08	Examine accessibility requirements for various types of users, including handicapped people, pedestrian or vehicular
AR-T10-09	Assess the surveillance needs of users to increase the level of security in the areas that surround their buildings
AR-T10-10	Identify the functional requirements of special groups in buildings and in their surroundings
AR-T10-11	Identify the psychological requirements of special groups inside buildings and in their surroundings
AR-T10-12	Identify the physical requirements of special groups in buildings and in their surroundings

Topic T11	Sustainability
Standard AR-T11	The architect should have gained satisfactory knowledge of the ways of realizing architectural designs that are ecologically sustainable, and responding to conservation and rehabilitation constraints
Weight	4 %
Indicators	
AR-T11-01	list passive solar design methods
AR-T11-02	Identify heat transfer process (heat loss / heat gain)
AR-T11-03	Describe water conservation concepts
AR-T11-04	Apply energy conservation concepts on a design problem
AR-T11-05	Identify a building design method to minimize the fossil fuel use in building design
AR-T11-06	Define the systems proposed by urban designers and planners to maximize the use of renewable energy methods in buildings
AR-T11-07	Name the systems of building design which enable the use of renewable materials in buildings
AR-T11-08	List dangerous and hazardous materials banned by planners due to their bad effect on human health
AR-T11-09	Define the systems proposed by planners and urban designers to minimize excessive water usage in landscaping and urban projects

Topic T12	Social Responsibility
Standard AR-T12	Architects must be aware of the responsibilities regarding urban, architectural, and environmental values, along with their cultural, social, and human accountabilities, in addition to, architectural heritage values
Weight	4%

Indicators	
AR-T12-01	Demonstrate adequate understanding of urban values: e.g. revitalization of local urban neighborhoods, attractiveness, respect of human scale, and safety
AR-T12-02	Integrate architectural values (e.g. attractiveness, harmony, functionality, serviceability, and sustainability) in building design
AR-T12-03	Show adequate attention to environmental values: e.g. conservation, waste management, cleanliness, respect for the earth, and harmony with the environment
AR-T12-04	Show adequate attention to cultural values: e.g. integrity, freedom, unity, sharing, self-reliance, and cooperation
AR-T12-05	Show adequate attention to social values: e.g. respect, responsibility, solidarity, and equality
AR-T12-06	Show adequate attention to human values: e.g. justice, peace, caring, well-being, and trust
AR-T12-07	Show adequate attention to heritage issues in the built environment: e.g. conservation, renovation, rehabilitation

Topic T13	Building Systems
Standard AR-T13	The architect must be knowledgeable about the technologies that help overcome the physical problems that affect users' comfort with building interiors and protect buildings against climatic conditions
Weight	4 %

Indicators

AR-T13-01	Identify the essential design climatic solutions in desert hot-arid and coastal regions
AR-T13-02	Apply the basic principles of climatic comfort inside buildings: space temperature (cooling/heating), control of humidity levels (drying, humidifying), air flow (circulation, distribution), and air quality (filtration)
AR-T13-03	Analyze the climatic conditions that relate to the buildings to be designed
AR-T13-04	Design according to the requirements of mechanically-controlled environments
AR-T13-05	Design green areas to increase the users' comfort and improve the quality of indoor and outdoor spaces
AR-T13-06	Describe the different types of air-conditioning systems and their properties
AR-T13-07	Select the most appropriate system among the different types of air-conditioning systems for specific types of buildings
AR-T13-08	Describe the basic traditional cooling methods
AR-T13-09	Compare the different shading devices
AR-T13-10	Integrate traditional methods of climatic protection with modern systems

Topic T14	Fine Arts
Standard AR-T14	The architect should have knowledge about fine arts and the theory of colors
Weight	4%

Indicators	
AR-T14-01	Name schools of fine art
AR-T14-02	Relate buildings to the schools of fine art that influence their designs
AR-T14-03	Describe the psychological effect of a color in a specific architectural functional space
AR-T14-04	Explain the color circle theory
AR-T14-05	Distinguish the visual effect of color types (hot/cold) in architectural functional space
AR-T14-06	Select a color scheme for a specific architectural function
AR-T14-07	Identify the esthetic values in buildings facades

Topic T15	Advanced Building Technologies
Standard AR-T15	The architect is expected to be aware of the recent, innovative, and advanced building technologies related to the building design, construction, operation and maintenance
Weight	4 %

Indicators

AR-T15-01	Describe the applications of Building Information Modeling (BIM) in building construction
AR-T15-02	Explain the concept of smart buildings
AR-T15-03	Recognize the applications of smart materials
AR-T15-04	Explain the benefits of Computer Aided Manufacturing (CAM) in building construction
AR-T15-05	Compare among the types of light structures
AR-T15-06	Classify the contemporary construction equipment and machinery
AR-T15-07	Categorize the considerations of constructing temporary buildings
AR-T15-08	Explain a water recycling system used in buildings
AR-T15-09	Describe a recent lighting system
AR-T15-10	Mention recent technologies used for energy saving in building

Topic T16	Self and Continuous Learning
Standard AR-T16	The architect is expected to have acquired the basic knowledge and training in research methods and techniques in order to maintain their capabilities in architectural learning
Weight	4 %

Indicators	
AR-T16-01	Demonstrate the ability to decide when to conduct a research and for what purposes
AR-T16-02	Formulate research questions
AR-T16-03	Identify research objectives
AR-T16-04	Plan a research framework and select the most appropriate methodology within the time-frame and available resources
AR-T16-05	Design a questionnaire that satisfies the data collection requirements within the research framework
AR-T16-06	Demonstrate the ability to conduct interviews (structured and open) without biases or influencing respondents
AR-T16-07	Describe people and their patterns of using space systematically
AR-T16-08	Analyze data according to the applied research methodology
AR-T16-09	Apply basic statistical analyses, using packages such as SPSS or Excel
AR-T16-10	Conclude logical findings after data collection and analysis

Chapter 5

Examination Guidelines

5.1. Introduction

This architects' examination evaluates the examinees knowledge and skills required to begin their career in practicing architecture in the Kingdom of Saudi Arabia. The examination will be conducted and evaluated by the National Center for Assessment in Higher Education (QYIAS). Passing the exam will be a requirement to be registered as an architect in the Saudi Council of Engineering for both Saudi graduates of architecture and the incoming international architects.

5.2. Objective

The objective of these guidelines is to show how the examinations would be conducted. The guidelines describe the exam structure, timing, percentage of question coverage and distribution among various topic areas.

5.3. Exam Description

The exam may be conducted initially in a paper-based format and in one session, and it could be transformed into a computer-based format in a later stage. The duration of the exam is (3) hours and it consists of (100) multiple choice questions (MCQ) where each question has four choices for the answer, and there is no negative marking for wrong answers. However, it is intended to conduct another exam session to measure the skills of design and creativity.

5.4. Eligibility for the Exam

Holders of a bachelor degree in architecture with at least 4 years of study are eligible to take the exam. It is intended for both graduates from a

Saudi architectural college, or holders of a bachelor degree in architecture from a foreign university

5.5. Exam Rules

☐ Books, lecture notes, or any types of learning materials are not allowed in the exam. Necessary references, tables or/and relevant data from codes will be provided by the examiner when applicable.

☐ Calculators approved by Exam authorities are allowed.

☐ Admission in the examination center will be only through an authorized admission card

☐ Examinees are subject to all the rules and procedures applied by National Center for Assessment in Higher Education (Qiyas).

5.6. The Examination Specifications

To facilitate the transformation of the architectural professional standards and indicators into balanced and coherent examinations, the following (Table 6) shows the specifications for the Architects' Exam.

Table 6: Specifications for the Architects' Exam

Topic Code	Topic Area	(%) of Exam	Number of Questions	Architectural Standard	Assigned Allocations of Questions among Learning Levels		
					Remembering and Understanding	Applying and Analyzing	Evaluating and Creating
T1	Architectural Design	14%	14	AR-T1	2	6	6
T2	Design Skills	12%	12	AR-T2	6	3	3
T3	Policies & Regulations	10%	10	AR-T3	8	2	0
T4	Architectural Programming	6%	6	AR-T4	1	3	2
T5	History & Theories	6%	6	AR-T5	2	4	0
T6	Structures & Construction	6%	6	AR-T6	3	2	1
T7	Urban Design & Planning	6%	6	AR-T7	2	4	0
T8	Professional Practice	6%	6	AR-T8	3	2	1
T9	Project Management	6%	6	AR-T9	3	3	0
T10	Humanities	4%	4	AR-T10	2	2	0
T11	Sustainability	4%	4	AR-T11	3	1	0

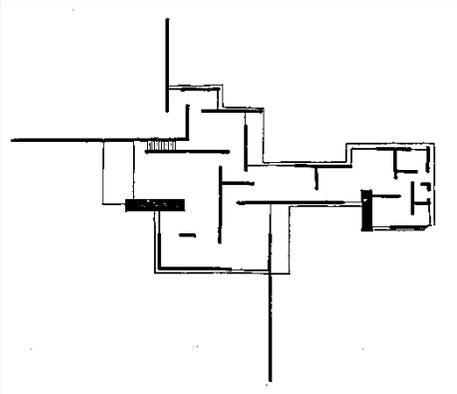| T12	Social Responsibility	4%	4	AR-T12	0	3	1
T13	Building Systems	4%	4	AR-T13	2	1	1
T14	Fine Arts	4%	4	AR-T14	2	2	0
T15	Advanced Building Technologies	4%	4	AR-T15	2	2	0
T16	Self & Continuous Learning	4%	4	AR-T16	1	2	1
Total		**100%**	**100**		**42**	**42**	**16**
Time		**-**	**3 hrs**	**-**	**44 mins (1 min per question) Approx.**	**86 mins (2 mins per question) Approx.**	**50 mins (4 mins per question) Approx.**

5.7. Sample Questions

Q No.	Standard	Topic Area	Indicator	Learning Level	Question Statement (Answer's Choices)	Answer	Expected Time (min)
1	AR-T1	**Architectural Design**	AR-T1-06	AA	**Select the appropriate structural system for a workshop project of a free span plan, measures (60m width X 120m length):** A) Concrete simple beam B) Concrete frame C) Steel truss D) Steel portal frame	C	2 mins
2	AR-T2	**Design Skills**	AR-T2-06	RU	**In describing a building design program, a building design program is a statement of:** A) The cost estimation and the feasibility study of the building B) The design requirements and areas needed for each space in the building C) The design process and its related phases D) The duration of the design process	B	1 min

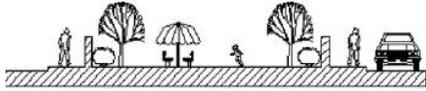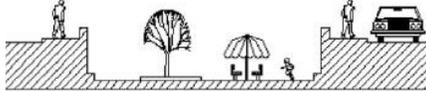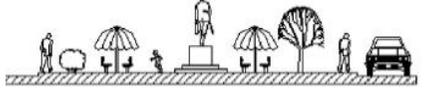| 3	AR-T3	**Policies & Regulations**	AR-T3-10	RU	**A city master plan can be defined as:** A) A narrative account of all the professionals and disciplines involved in making the city future B) A composite of images that explain the development of the city C) A technical procedure for the city's infrastructure D) A textual, legal , graphic, and technical document that guide the city's future growth and development	D	1 min
4	AR-T4	**Architectural Programming**	AR-T4-06	RU	**One of the following actions increases the functional efficiency of a building:** A) Minimizing the circulation area B) Increasing the dimensions of the structural systems C) Avoiding skylights and large openings D) Utilizing many entrances and exits	A	1 min

5	AR-T5	**History & Theory**	AR-T5-07	RU	To which school of thought the given plan is related? A) Postmodernism B) Modernism C) Mannerism D) Deconstructivism	B	1 min

6	AR-T6	**Structures & Construction**	AR-T6-02	RU	**Which of the following materials is used for galvanizing steel or iron?** A) Brass B) Chrome C) Silver D) Zinc	D	1 min
7	AR-T7	**Urban Design & Planning**	AR-T7-04	RU	**Which of the following colors is correct to represent the building activity?** A) Yellow to represent residential use B) Green to represent commercial use C) Red represent recreational use D) Orange to represent industrial use	D	1 min
8	AR-T8	**Professional Practice**	AR-T8-08	RU	**According to the international building code, the minimum number of exits for a building story with occupant load 550 person is:** A) One exit B) Two exits C) Three exits D) Four exits	C	1 min

9	AR-T9	Project Management	AR-T9-01	RU	The consultant responsibilities in construction site include: E) Safety of personnel F) Storage of construction materials G) Material samples approval H) Develop as built drawings	C	1 min
10	AR-T10	Humanities	AR-T10-08	RU	According to the accessibility requirements for people with disabilities, what is the maximum permissible curb ramp slopes? A) 1:10 B) 1:12 C) 1:20 D) 1:24	A	1 min
11	AR-T11	Sustainability	AR-T11-08	RU	Which building material has been banned due to its health hazards: A) Plastic sheets B) Gypsum boards C) Concrete beams D) Asbestos	D	1 min

12	AR-T12	**Social Responsibility**	AR-T12-010	EC	**Which of the following urban spaces would encourage active public use?** A) B) C) D)	C	4 min
13	AR-T13	**Building Systems**	AR-T13-01	RU	**Identify the most effective design solution that suits the climatic conditions for buildings in the hot-arid regions:** A) Allow greater cross ventilation B) Increase street width C) Use cooling towers D) Minimize the number of floors	C	1 min

14	AR-T14	**Fine Arts**	AR-T14-01	RU	**The purple color is the mix of:** A) Green and Blue B) Blue and Red C) Yellow and Blue D) Red and Yellow	B	1 min
15	AR-T15	**Advanced Building Technologies**	AR-T15-06	RU	**In the field of construction, bulldozers are classified as:** A) Earthwork equipment B) Transportation trucks C) Material handling equipment D) Surveying equipment	A	1 min
16	AR-T16	**Self & Continuous Learning**	AR-T16-01	RU	**Which of the following statements reflects a logical research objective:** A) To help people use the building effectively B) To encourage users' participation in the design phase C) To recommend the most appropriate project financing method D) To understand the requirements of users	D	1 min

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5) http://www.ncaaa.org.sa/Pages/default.aspx

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Appendices

Appendix A

The Royal Institute of British Architects (RIBA):

The RIBA Procedures for Validation and Validation Criteria for International Courses and Examinations in Architecture

Education has always been central to the RIBA and, parallel to the practice of architecture, is the centerpiece of the original 1834 Royal Charter. The RIBA examinations in architecture were established in 1863; in 1882, successful completion of these became compulsory for those seeking membership of the Institute. Responding to requests from schools of architecture - and as an alternative route to membership - the RIBA developed systems for recognizing courses that achieved the standard for exemption from the Institute's examinations. In 1924, the RIBA visiting boards were established to evaluate courses and examinations preparing students for professional practice. These visiting boards are the foundation of the current RIBA validation system.

Today, the RIBA validation is an evidence-based, peer review system working internationally as a critical friend to schools of architecture, monitoring courses to improve median achievement, encourage the excellent, and ensure a positive student experience. In the UK, the RIBA validates the three essential award levels of professional study known as RIBA parts 1, 2, and 3.

Requirements at parts 1, 2, and 3

☐ The General Criteria at parts 1 and 2
☐ The Graduate Attributes for part 1
☐ The Graduate Attributes for part 2
☐ The Professional Criteria at part 3

The General Criteria at RIBA part 1 and RIBA part 2

GC1: Ability to create architectural designs that satisfy both aesthetic and technical requirements

GC1: The graduate will have the ability to

1. Prepare and present building design projects of diverse scale, complexity, and type in a variety of contexts, using a range of media, and in response to a brief.
2. Understand the constructional and structural systems, the environmental strategies and the regulatory requirements that apply to the design and construction of a comprehensive design project.
3. Develop a conceptual and critical approach to architectural design that integrates and satisfies the aesthetic aspects of a building and the technical requirements of its construction and the needs of the user.

GC2 Adequate knowledge of the histories and theories of architecture and the related arts, technologies and human sciences

GC2: The graduate will have knowledge of

1. The cultural, social and intellectual histories, theories and technologies that influence the design of buildings;
2. The influence of history and theory on the spatial, social, and technological aspects of architecture;
3. The application of appropriate theoretical concepts to studio design projects, demonstrating a reflective and critical approach

GC3 Knowledge of the fine arts as an influence on the quality of architectural design

GC3: The graduate will have knowledge of

1. How the theories, practices and technologies of the arts influence architectural design;

2. The creative application of the fine arts and their relevance and impact on architecture;
3. The creative application of such work to studio design projects, in terms of their conceptualization and representation.

GC4 Adequate knowledge of urban design, planning and the skills involved in the planning process

GC4: The graduate will have knowledge of

1. Theories of urban design and the planning of communities;
2. The influence of the design and development of cities, past and present on the Contemporary built environment;
3. Current planning policy and development control legislation, including social,
4. Environmental and economic aspects and the relevance of these to design development

GC5 Understanding of the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces between them to human needs and scale

GC5: The graduate will have an understanding of:

1. The needs and aspirations of building users;
2. The impact of buildings on the environment, and the precepts of sustainable design;
3. The way in which buildings fit into their local context.

GC6 Understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take account of social factor

GC6: the graduate will have an understanding of:

1. The nature of professionalism and the duties and responsibilities of architects to clients, building users, constructors, co-professionals and the wider society;
2. The role of the architect within the design team and construction industry, recognizing the importance of current methods and trends in the construction of the built environment;
3. The potential impact of building projects on existing and proposed communities.

GC7 Understanding of the methods of investigation and preparation of the brief fora design project

GC7: The graduate will have an understanding of:

1. The need to critically review precedents relevant to the function, organization and technological strategy of design proposals;
2. The need to appraise and prepare building briefs of diverse scales and types, to define client and user requirements and their appropriateness to site and context;
3. The contributions of architects and co-professionals to the formulation of the brief, and the methods of investigation used in its preparation.

GC8 Understanding of the structural design, constructional and engineering problems associated with building design

GC8: The graduate will have an understanding of:

1. The investigation, critical appraisal and selection of alternative structural, constructional and material systems relevant to architectural design;
2. Strategies for building construction, and ability to integrate knowledge of structural principles and construction techniques;

3. The physical properties and characteristics of building materials, components and systems, and the environmental impact of specification choices.

GC9 Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate

GC9: The graduate will have knowledge of:

1. Principles associated with designing optimum visual, thermal and acoustic environments;
2. Systems for environmental comfort realized within relevant precepts of sustainable design;
3. Strategies for building services, and ability to integrate these in a design project.

GC10 The necessary design skills to meet building users' requirements within the constraints imposed by cost factors and building regulations

GC10: The graduate will have the skills to:

1. Critically examine the financial factors implied in varying building types, constructional systems, and specification choices, and the impact of these on architectural design;
2. Understand the cost control mechanisms which operate during the development of a project;
3. Prepare designs that will meet building users' requirements and comply with UK legislation, appropriate performance standards and health and safety requirements.

GC11 Adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning

GC11: The graduate will have knowledge of:

1. The fundamental legal, professional and statutory responsibilities of the architect, and the organizations, regulations and procedures involved in the negotiation and approval of architectural designs, including land law, development control, building regulations and health and safety legislation;

2. The professional inter-relationships of individuals and organizations involved in procuring and delivering architectural projects, and how these are defined through contractual and organizational structures;

3. The basic management theories and business principles related to running both an architects' practice and architectural projects, recognizing current and emerging trends in the construction industry.

The Graduate Attributes for part 1

GA1 With regard to meeting the eleven General Criteria at parts 1 and 2 above, the part 1 will be awarded to students who have:

1. Ability to generate design proposals using understanding of a body of knowledge, some at the current boundaries of professional practice and the academic discipline of architecture;

2. Ability to apply a range of communication methods and media to present design proposals clearly and effectively;

3. Understanding of the alternative materials, processes and techniques that apply to architectural design and building construction;

4. Ability to evaluate evidence, arguments and assumptions in order to make and present sound judgments within a structured discourse relating to architectural culture, theory and design;

5. Knowledge of the context of the architect and the construction industry, and the professional qualities needed for decision making in complex and unpredictable circumstances; and

6. Ability to identify individual learning needs and understand the personal responsibility required for further professional education.

The Graduate Attributes for part 2

GA2 With regard to meeting the eleven General Criteria at parts 1 and 2 above, the part 2 will be awarded to students who have:

1. Ability to generate complex design proposals showing understanding of current architectural issues, originality in the application of subject knowledge and, where appropriate, to test new hypotheses and speculations;

2. Ability to evaluate and apply a comprehensive range of visual, oral and written media to test, analyze, critically appraise and explain design proposals;

3. Ability to evaluate materials, processes and techniques that apply to complex architectural designs and building construction, and to integrate these into practicable design proposals;

4. Critical understanding of how knowledge is advanced through research to produce clear, logically argued and original written work relating to architectural culture, theory and design;

5. Understanding of the context of the architect and the construction industry, including the architect's role in the processes of procurement and building production, and under legislation;

6. Problem solving skills, professional judgement, and ability to take the initiative and make appropriate decisions in complex and unpredictable circumstances; and

7. Ability to identify individual learning needs and understand the personal responsibility required to prepare for qualification as an architect.

Professional Practice examination: RIBA part 3

1. Practical experience eligibility criteria

Candidates for the RIBA part 3 oral examination stage should have recently completed a minimum of 24 months' practical experience under the direct supervision of a professional working in the construction industry, which

should include at least 12 months working in the EEA, Channel Islands, or the Isle of Man, under the direct supervision of an architect.

2. PEDR categories of experience

1. Experience of architectural practice in the UK, EEA, Channel Islands, or Isle of Man, under the direct supervision of an architect registered with the Architects Registration Board, or registered within the territory where the experience is being undertaken.
2. Experience of architectural practice in any other location, under the direct supervision of an architect registered within the territory where the experience is being undertaken
3. Experience within the construction industry under the supervision of a qualified professional within the relevant field

3. Professional Practice examination

The Professional Practice examination (RIBA part 3) is usually in two parts:

1. A documentary submission to demonstrate professional knowledge, judgement, conduct and ethics, which includes the practical training record
2. An oral examination

The documentary submission

Candidates demonstrate that they meet the RIBA Professional Criteria for part 3 through a documentary submission defined by the provider, and typically consisting of the following:

1. Professional curriculum vitae recording the candidate's educational and professional career, including non-architectural work, and summarizing the candidate's experience in architectural practice.

2. A career evaluation including a personal appraisal of the candidate's education and experience of architectural practice within the context of the part 3 criteria.

3. A record of professional experience recording the development of competences achieved through practical experience over a minimum period of 24 months. Further information on this requirement can be found at www.pedr.co.uk

4. A case study reflecting the candidate's professional experience and examination requirements, but usually a critical written evaluation of at least one project undertaken by the candidate during their recorded practical training, supplementing the PEDR and career evaluation [NB: candidates with experience of multiple projects, where no single project covers all the RIBA work stages, may draw from their experience of different projects to illustrate their competence to practice as an architect]

5. Written examinations, assessed course work, scenario-based essays and reports demonstrating a candidate's knowledge and understanding of professional practice, and their ability to exercise sound judgement, and make responsible decisions

Part 3 providers have different methods of delivering the Professional Practice curriculum; typically, these include scenario-based assessment and written examinations, but other forms of evaluation should continue to be developed.

The oral examination

The oral examination is the final element in the examination process. It provides an opportunity for candidates to develop and comment upon their documentary submission through discussion with the Professional Examiners, who may further establish the candidate's judgment and understanding in relation to the Professional Criteria for part 3.

The Professional Criteria at part 3

Candidates wishing to sit the Professional Practice Examination in Architecture (part 3) are normally required to have successfully completed a recognized qualification at part 1 and part2 level, or their equivalent recognized examinations. In addition, candidates are required to have completed the relevant professional practice experience before undertaking the Examination.

Each candidate's experience of learning and development in professional practice will differ, depending upon the type of project, type and location of practice and management processes undertaken, and the preparation for the examination must therefore be approached in a structured way.

The candidate should manage the relationship between professional experience and academic study to provide coverage of the Professional Criteria, presenting a critically reflective body of work that complies with the requirements of the professional studies adviser or course provider. To meet the Professional Criteria, the candidate's experience should include evidence of commercial awareness, self-management, professional competence and integrity. A successful candidate should also be able to demonstrate authorship, knowledge, effective communications skills, and reasoning and understanding in relation to all issues within the Professional Criteria outlined below.

PC1: Professionalism

A successful candidate will demonstrate overall competence and the ability to behave with integrity, in the ethical and professional manner appropriate to the role of architect. The candidate will have the skills necessary to undertake effective communication and presentation, organization, self-management and autonomous working. The candidate will have a clear understanding of the architect's obligation to society and the profession, and a sufficient awareness of the limits of their competence and professional experience to ensure they are unlikely to bring the profession into disrepute.

Demonstration of an understanding of the following will contribute to this criterion being met

1. Professional ethics
2. The architect's obligation to society and the protection of the environment
3. Professional regulation, conduct and discipline
4. Institutional membership, benefits, obligations and codes of conduct
5. Attributes of integrity, impartiality, reliability and courtesy
6. Time management, recording, planning and review
7. Effective communication, presentation, confirmation and recording;
8. Flexibility, adaptability and the principles of negotiation
9. Autonomous working and taking responsibility within a practice context
10. Continuing professional development

PC2: Clients, users, and delivery of services

A successful candidate will be able to demonstrate understanding of the range of services offered by architects and delivering those services in a manner prioritizing the interests of the client and other stakeholders. The candidate will have the skills necessary to provide a competent service, both singly and as part of a team, including understanding of client needs, appropriate communication, programming, coordination and competent delivery. This will be supported by knowledge of the briefing process, forms and terms of appointment, the means of professional remuneration, relevant legislation, and the execution of appropriate programmed and coordinated project tasks.

Demonstration of an understanding of the following will contribute to this criterion being met

1. Types of clients, their priorities and the management of the relationship
2. Briefing, organizing and the programming of services appropriate to appointment
3. Architects' contracts, terms of engagement, scope of services and relevant legislation
4. Obligations to stakeholders, warranties and third party rights

5. Communication, progress reporting and the provision of appropriate and timely advice

6. Budget and financial awareness and cost monitoring or control

7. Responsibility for coordination and integration of design team input

8. Invoicing, payment of fees and financial management

9. Intellectual property rights and copyright law

10. Duty of care, professional liability, negligence and professional indemnity including insurance

PC3: Legal framework and processes

A successful candidate will be able to demonstrate understanding of the legal context within which an architect must operate, and the processes undertaken to ensure compliance with legal requirements or standards. The candidate will have the skills necessary to positively interact with statutory and private bodies or individuals, and competently deliver projects within diverse legislative frameworks. This will be supported by knowledge of the relevant law, legislation, guidance and controls relevant to architectural design and construction.

Demonstration of an understanding of the following will contribute to this criterion being met

1. The relevant UK legal systems, civil liabilities and the laws of contract and tort

2. Planning and Conservation Acts, guidance and processes

3. Building regulations, approved documents and standards, guidance and processes

4. Land law, property law and rights of other proprietors

5. Terms within construction contracts implied by statute

6. Health and safety legislation and regulations

7. Statutory undertakers and authorities, their requirements and processes

8. Environmental and sustainability legislation
9. Historic buildings legislation
10. Accessibility and inclusion legislation

PC4: Practice and management

A successful candidate will be able to demonstrate understanding of the business priorities, required management processes and risks of running an architectural practice, and the relationship between the practice of architecture and the UK construction industry. The candidate will have the skills necessary to engage in business administration and ability to resource, plan, implement and record project tasks to achieve stated goals, either individually or within a team. This will be supported by knowledge of the nature of legal business entities, office systems, administration procedures and the relevant legislation.

Demonstration of an understanding of the following will contribute to this criterion being met

1. The roles of architectural practice in the construction industry
2. External factors affecting construction and practice at national and international levels
3. Practice structures, legal status and business styles
4. Personnel management and employment-related legislation
5. Practice finance, business planning, funding and taxation
6. Marketing, fee calculation, bidding and negotiation
7. Resource management and job costing
8. Administration, quality management, QA systems, recording and review
9. Staff development, motivation, supervision and planning
10. Team working and leadership

PC5: Building Procurement

A successful candidate will be able to demonstrate understanding of UK construction and contract law, construction procurement processes and the roles of built environment professionals. The candidate will have the skills necessary to plan project-related tasks, coordinate and engage in design team interaction, execute effective contract communication and resolve construction-related challenges and disputes. This will be supported by an understanding of contractual relationships, the obligations upon an architect acting as contract administrator, job-related administrative systems and the management of projects in the context of the candidate's professional experience.

Demonstration of an understanding of the following will contribute to this criterion being met

1. Procurement methods, including for public and larger projects and relevant legislation;
2. The effect of different procurement processes on program, cost, risk and quality;
3. Collaboration in construction and provisions for team working;
4. Tendering methods, codes, procedures and project planning;
5. Forms of contract and sub-contract, design responsibility and third party rights;
6. Application and use of contract documentation;
7. Roles of design/construction team members and their interaction;
8. Duties and powers of a lead consultant and contract administrator;
9. Site processes, quality monitoring, progress recording, payment and completion;
10. Claims, litigation and alternative dispute resolution methods.

Finally it is important to note, that the Royal Institute of British Architects is the first organization that presented a document to set the standard for the quality of both architectural education graduates and professionals. The RIBA validation criteria is designed to suit the British architectural education system,

that so called -sandwich system –which allows students to graduate either in four or in six years depending on each individual personal capability.

The RIBA introduced its validation criteria in three parts, where four years graduates capabilities should meet with the criteria given in both part 1 and 2. Only six years students are required to obtain validation by satisfying the requirements given in part three to be professional architects. Accordingly, technical issues related to architectural design are in the core interest of part 1 and 2. Professional aspects related to the roll of architect in improving the quality of life is the main issue in RIBA part 3 validation criteria, emphases were put on type of service offered to client and society, also the awareness of preserving the environment.

Appendix B

National Council of Architectural Registration Boards:

Architect Registration Examination (ARE)

The National Council of Architectural Registration Board (NCARB) produced the first national exam for architects in 1965. Since that time, many changes have been made to the exam—after deliberate, studied, and controlled evaluation—for two essential reasons: to update questions so that they reflect current architectural practices and to utilize technology that more accurately assesses the ability of candidates. In 1979, the NCARB conducted an extensive "task analysis and validation study" that led to the development of the forerunner of today's ARE. At that time, candidates were required to take all nine divisions over a four-day period. The exam was only offered once a year in major cities across the United States.

The National Council of Architectural Registration Boards protects the public health, safety, and welfare by leading the regulation of the practice of architectural through the development and application of standards for licensure and credentialing of architects.

No single examination can test for competency in all aspects of architecture, which is why the Architect Registration Examination (ARE) is not the only requirement to become a licensed architect. ARE concentrates on those services that most affect the public health, safety, and welfare? ARE has been developed with specific concern for its fidelity to the practice of architecture; that is, its content relates to the actual tasks an architect encounters in practice. This examination attempts to determine the candidate's qualifications not only to perform measurable tasks, but also to exercise the skills and judgment of a

generalist working with numerous specialists. In short, the objective is to reflect the practice of architecture as an integrated whole.

I. Programming, Planning and Practice

☐ **Programming and analysis**

☐ Assess client needs and requirements to develop a master plan and program.

☐ Document design objectives including site characteristics, spatial and functional relationships, and building systems considerations.

☐ Establish preliminary project scope, phasing, budget, and schedule.

☐ **Environmental, social and economic issues**

☐ Obtain and review site and building surveys.

☐ Assess physical, environmental, social, and economic issues and project impact.

☐ Develop project concepts utilizing sustainable principles, alternative energy systems, and new material technologies.

☐ Apply basic design principles and historic precedent.

☐ **Codes and regulations**

☐ Identify, analyze, and incorporate building codes, specialty codes, zoning, and other regulatory requirements.

☐ Manage regulatory approval process.

☐ **Project and practice management**

☐ Develop scope of services and project delivery method.

☐ Assess project budget and financing.

☐ Identify project team members including consultants.

☐ Document project meetings.

☐ Manage project schedule and design process.

☐ Assist with construction procurement. Manage legal issues relating to practice including fees, insurance and professional services contracts.

II. Construction Documents and Services

☐ **Codes and regulations**

Incorporate building codes, specialty codes, zoning, and other regulatory requirements in construction documents and services

☐ **Environmental issues**

Incorporate sustainable design principles, universal design, adaptive reuse concepts, alternative energy systems, new material technologies, and hazardous material mitigation in construction documents

☐ **Construction drawings and project manual**

Prepare and coordinate construction drawings including building systems, product selection, and constructability. Prepare, coordinate, and review general and supplementary conditions and technical specifications

☐ **Project and practice management**

☐ Prepare estimates of probable construction cost. Consider cost implications on design decisions

☐ Prepare and manage project schedule and coordinate all contract documents including those of consultants

☐ Establish project delivery method. Provide contract administration documentation and services

☐ Review and administer professional services and construction contracts. Consider issues pertaining to practice including risk management and professional and business ethics

III. Site Planning and Design

☐ **Principles**

Review and assess sites. Incorporate the implication of human behavior, historic precedent, and design theory in the selection of systems, materials, and methods related to site design and construction

☐ **Environmental issues**

Interpret site and environmental conditions. Assess and apply systems, materials, and construction methods. Incorporate principles of sustainability. Assess design impact on human behavior

☐ **Codes and regulations**

Incorporate building codes, specialty codes, zoning and other regulatory requirements in site design and construction

☐ **Materials and technology**

Analyze the implication of design decisions in the selection of systems, materials, and methods incorporated in site design and construction

☐ **Project and practice management**

Assess and administer site design, including construction sequencing, scheduling, cost, and risk management

IV. Schematic Design

☐ **Interior layout**

Design an interior space plan and furniture arrangement responding to program, code, and accessibility requirements

☐ **Building layout**

Develop a schematic design for a two-story building addressing program, code, site, and environmental requirements

V. Structural Systems

☐ **General structures**

☐ Apply general structural principles to building design and construction

☐ Analyze the implications of design decisions in the selection of systems, materials, and construction details related to general structural design

☐ Incorporate building codes, specialty codes, and other regulatory requirements in the design of general structural systems

    ☐ **Seismic forces**

☐ Apply seismic forces principles to building design and construction

☐ Analyze the implications of design decisions in the selection of systems, materials, and construction details related to seismic forces design

☐ Incorporate building codes, specialty codes, and other regulatory requirements related to seismic forces

    ☐ **Wind forces**

☐ Apply lateral forces principles to the design and construction of buildings to resist wind forces

☐ Analyze the implications of design decisions in the selection of systems, materials, and construction details related to wind forces

☐ Incorporate building codes and other regulatory requirements related to wind forces

    ☐ **Lateral forces**

☐ Apply lateral forces principles to the design and construction of buildings

☐ Analyze the implications of design decisions in the selection of systems, materials, and construction details related to lateral forces

VI. Building Systems

    ☐ **Codes and regulations**

Incorporate building codes, specialty codes, and other regulatory requirements in the design of mechanical, electrical, plumbing, conveying, and other specialty systems

    ☐ **Environmental issues**

Apply sustainable design principles to the selection, design, and construction of building systems

☐ **Plumbing**

☐ Analyze and design plumbing systems

☐ Evaluate and select materials and construction details related to plumbing systems

☐ **HVAC**

☐ Analyze and design heating, ventilating, and air conditioning systems

☐ Evaluate and select materials and construction details related to heating, ventilating, and air conditioning systems

☐ **Electrical**

☐ Analyze and design electrical systems

☐ Evaluate and select materials and construction details related to electrical systems

☐ **Lighting**

☐ Analyze and design natural and artificial lighting systems

☐ Evaluate and select materials and construction details related to natural and artificial lighting systems

☐ **Specialties**

☐ Evaluate, select, and design acoustical systems

☐ Evaluate, select, and design communications and security systems

☐ Evaluate, select, and design elevators, escalators, moving walkways, and other conveying systems

☐ Evaluate, select, and design fire detection and suppression systems

VII. Construction Documents and Services

☐ **Codes and regulations**

Incorporate building codes, specialty codes, zoning, and other regulatory requirements in construction documents and services

☐ **Environmental issues**

Incorporate sustainable design principles, universal design, adaptive reuse concepts, alternative energy systems, new material technologies, and hazardous material mitigation in construction documents

☐ **Construction drawings and project manual**

Prepare and coordinate construction drawings including building systems, product selection, and constructability. Prepare, coordinate, and review general and supplementary conditions and technical specifications

☐ **Project and practice management**

☐ Prepare estimates of probable construction cost. Consider cost implications on design decisions

☐ Prepare and manage project schedule and coordinate all contract documents including those of consultants

☐ Establish project delivery method. Provide contract administration documentation and services

☐ Review and administer professional services and construction contracts. Consider issues pertaining to practice including risk management and professional and business ethics

Appendix C

UIA Standards of Professionalism in Architectural Practice:

The third case study is the UIA Standards that have been extracted from the Accord on Recommended International Standards of Professionalism in Architectural Practice, which adopted by its professional practice commission in 1999, published in December 2006, and amended recently in August 2014. The International Union of Architects (Union International des Architects or UIA) was founded in 1948 to unite the architects of all countries in a federation of their national organizations. The UIA now represents some 1,300,000 architects in more than 100 countries. The mission of UIA is to represent all architectural organizations and individual architects of different countries, with parallel non-government organizations of other disciplines, and with intergovernmental institutions.

The UIA established the Professional Practice Commission and approved its program in 1994. The Commission has devoted nine years of intensive study and debate in development of the "UIA Accord on Recommended International Standards of Professionalism in Architectural Practice" (the Accord) and nine related Accord policy guidelines. The Accord contains a statement of principles of professionalism and a series of 16 policy issues in a format of definitions and background statements followed by policy statements. These documents were presented to the triennial UIA Congress and Assembly in Beijing, China in July 1999. This is an historic achievement - it is the first time the profession of architecture has adopted a global standard. Updates by the Commission, approved by the Council, and through the Assembly have been implemented since that time.

The report of UIA has determined the fundamental requirements for licensing the architects, these requirements refers to the knowledge, skills, and abilities that must be mastered through recognized education and training, and demonstrable knowledge, capability, and experience in order to be considered professionally qualified to practice architecture.

The fundamental knowledge and abilities of an architect

In August 1985, for the first time, a group of countries came together to set down the fundamental knowledge and abilities of an architect. These include:

1. Ability to create architectural designs that satisfy both aesthetic and technical requirements, and which aim to be environmentally sustainable.
2. Adequate knowledge of the history and theories of architecture and related arts, technologies, and human sciences.
3. Knowledge of the fine arts as an influence on the quality of architectural design.
4. Adequate knowledge of urban design, planning, and the skills involved in the planning process.
5. Understanding of the relationship between people and buildings and between buildings and their environments, and of the need to relate buildings and the spaces between them to human needs and scale.
6. Understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors.
7. Understanding of the methods of investigation and preparation of the brief for a design project.
8. Understanding of the structural design, construction, and engineering problems associated with building design.
9. Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate.

10. Design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations.

11. Adequate knowledge of the industries, organizations, regulations, and procedures involved in translating design concepts into buildings and integrating plans into overall planning.

12. Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.

13. Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.

14. Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.

15. Adequate knowledge of project financing, project management, cost control and methods of project delivery.

16. Training in research techniques as an inherent part of architectural learning, for both students and teachers.

The capabilities of an Architect that should be acquired through architectural education

The revised UNESCO/UIA Charter for Architectural Education was adopted by the UIA General Assembly in July 2005. The Charter includes the following language related to both the development of curriculum for architectural education and the acquisition of the following capabilities:

That the following special points be considered in the development of the curriculum

☐ Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage.

☐ Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.

☐ Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.

☐ Adequate knowledge of project financing, project management, cost control and methods of project delivery.

☐ Training in research techniques as an inherent part of architectural learning, for both students and teachers.

That architectural education involves the acquisition of the following capabilities

☐ **Design**

☐ Ability to engage imagination, think creatively, innovate and provide design leadership.

☐ Ability to gather information, define problems, apply analyses and critical judgment and formulate strategies for action.

☐ Ability to think three dimensionally in the exploration of design

☐ Ability to reconcile divergent factors, integrate knowledge and apply skills in the creation of a design solution.

☐ **Knowledge**

☐ Cultural and Artistic Studies

o Ability to act with knowledge of historical and cultural precedents in local and world architecture.

o Ability to act with knowledge of the fine arts as an influence on the quality of architectural design.

o Understanding of heritage issues in the built environment.

o Awareness of the links between architecture and other creative disciplines.

☐ Social Studies

- Ability to act with knowledge of society, and to work with clients and users that represent society's needs.
- Ability to develop a project brief through definition of the needs of society, users and clients, and to research and define contextual and functional requirements for different types of built environments.
- Understanding of the social context in which built environments are procured, of ergonomic and space requirements and issues of equity and access.
- Awareness of the relevant codes, regulations and standards for planning, design, construction, health, safety and use of built environments.
- Awareness of philosophy, politics, and ethics as related to architecture.

☐ Environmental Studies

- Ability to act with knowledge of natural systems and built environments.
- Understanding of conservation and waste management issues.
- Understanding of the life cycle of materials, issues of ecological sustainability, environmental impact, design for reduced use of energy, as well as passive systems and their management.
- Awareness of the history and practice of landscape architecture, urban design, as well as territorial and national planning and their relationship to local and global demography and resources.
- Awareness of the management of natural systems taking into account natural disaster risks.

☐ Technical Studies

- Technical knowledge of structure, materials, and construction.
- Ability to act with innovative technical competence in the use of building techniques and the understanding of their evolution.

- o Understanding of the processes of technical design and the integration of structure, construction technologies and services systems into a functionally effective whole.
- o Understanding of services systems as well as systems of transportation, communication, maintenance and safety.
- o Awareness of the role of technical documentation and specifications in design realization, and of the processes of construction cost planning and control.
- ☐ Design Studies
- o Knowledge of design theory and methods.
- o Understanding of design procedures and processes.
- o Knowledge of design precedents and architectural criticism.
- ☐ Professional Studies
- o Ability to understand different forms of procurement of architectural services.
- o Understanding of the fundamental workings of the construction and development industries, such as finance, real estate investment and facilities management.
- o Understanding of the potential roles of architects in conventional and new areas of activity and in an international context.
- o Understanding of business principles and their application to the development of built environments, project management and the functioning of a professional consultancy.
- o Understanding of professional ethics and codes of conduct as they apply to the practice of architecture and of the architects' legal responsibilities where registration, practice and building contracts are concerned.
- ☐ **Skill**
- ☐ Ability to work in collaboration with other architects and members of interdisciplinary teams.

☐ Ability to act and to communicate ideas through collaboration, speaking, numeric, writing, drawing, modeling and evaluation.

☐ Ability to utilize manual, electronic, graphic and model making capabilities to explore, develop, define and communicate a design proposal.

☐ Understanding of systems of evaluation, that use manual and/or electronic means for performance assessments of built environments.

Appendix D

The Participants' survey:

The Criteria	Very Important	Important	Fair	Unimportant	Very unimportant
1. The ability to create architectural designs that satisfy both aesthetic and technical requirements.					
2. Ability to engage imagination, think creatively, innovate and provide design leadership.					
3. Ability to gather information, define problems, apply analyses and critical judgment and formulate strategies for action.					
4. Ability to think three-dimensionally in the exploration of design.					
5. Ability to utilize manual, electronic, graphic and model making capabilities to explore, develop, define and communicate a design proposal.					

The Criteria	Very Important	Important	Fair	Unimportant	Very unimportant
6. Ability to act and to communicate ideas through collaboration, speaking, numeracy, writing, drawing, modelling and evaluation.					
7. Understanding of systems of evaluation, that use manual and/or electronic means for performance assessments of built environments.					
8. Ability to act with knowledge of historical and cultural precedents in local and world architecture.					
9. An adequate knowledge of the history and theories of architecture and the related arts, technologies and human sciences.					
10. Ability to act with knowledge of the fine arts as an influence on the quality of architectural design.					
11. Understanding of heritage issues in the built environment.					
12. An understanding of the relationship between people and buildings, and between buildings and their environment, and of the need to relate buildings and the spaces between them to human needs and scale.					

| The Criteria	Very Important	Important	Fair	Unimportant	Very unimportant
13. Ability to act with knowledge of society, and to work with clients and users that represent society's needs					
14. Ability to develop a project brief through definition of the needs of society users and clients, and to research and define contextual and functional requirements for different types of built environments.					
15. An awareness of the relevant codes, regulations and standards for planning, design, construction, health, safety and use of built environments					
16. Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.					
17. Ability to act with knowledge of natural systems and built environments.					
18. Understanding of the life cycle of materials, issues of ecological sustainability, environmental impact, design for reduced use of energy, as well as passive systems and their management.					
19. Awareness of the management of natural systems taking into account natural disaster risks.					

The Criteria	Very Important	Important	Fair	Unimportant	Very unimportant
20. Technical knowledge of structure, materials, and construction.					
21. Understanding of the processes of technical design and the integration of structure, construction technologies and services systems into a functionally effective whole.					
22. Understanding of services systems as well as systems of transportation, communication, maintenance and safety.					
23. An adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against the climate.					
24. An understanding of the structural design, construction and engineering problems associated with building design.					
25. Awareness of the role of technical documentation and specifications in design realization, and of the processes of construction, cost, planning and control.					
26. Understanding of design procedures and processes.					

The Criteria	Very Important	Important	Fair	Unimportant	Very unimportant
27. Ability to act with knowledge of professional, business, financial and legal contexts.					
28. Ability to understand different forms of procurement of architectural services.					
29. Adequate knowledge of project financing, project management, cost control and methods of project delivery.					
30. Understanding of business principles and their application to the development of built environments, project management and the functioning of a professional consultancy.					
31. An adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning.					
32. Understanding of professional ethics and codes of conduct as they apply to the practice of architecture and of the architects' legal responsibilities where registration, practice and building contracts are concerned.					
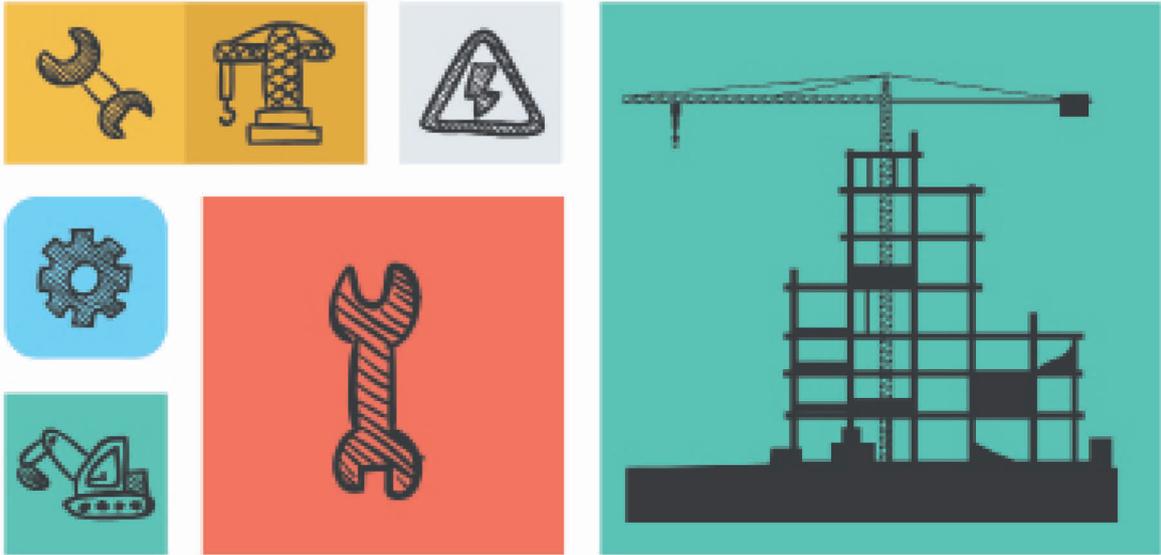
Tel. + 966 11 490 9090
Fax + 966 11 490 9077
faq@qiyas.org
P.O box 68566   Riyadh 11537
www.qiyas.sa

National Center for Assessment

Qiyasonline | www.qiyas.sa