



Ministry of Education

Test Blueprint for National Exit Examination to be held in 2016 E.C

Band: ONE

(Revised Version- 2106 E.C)

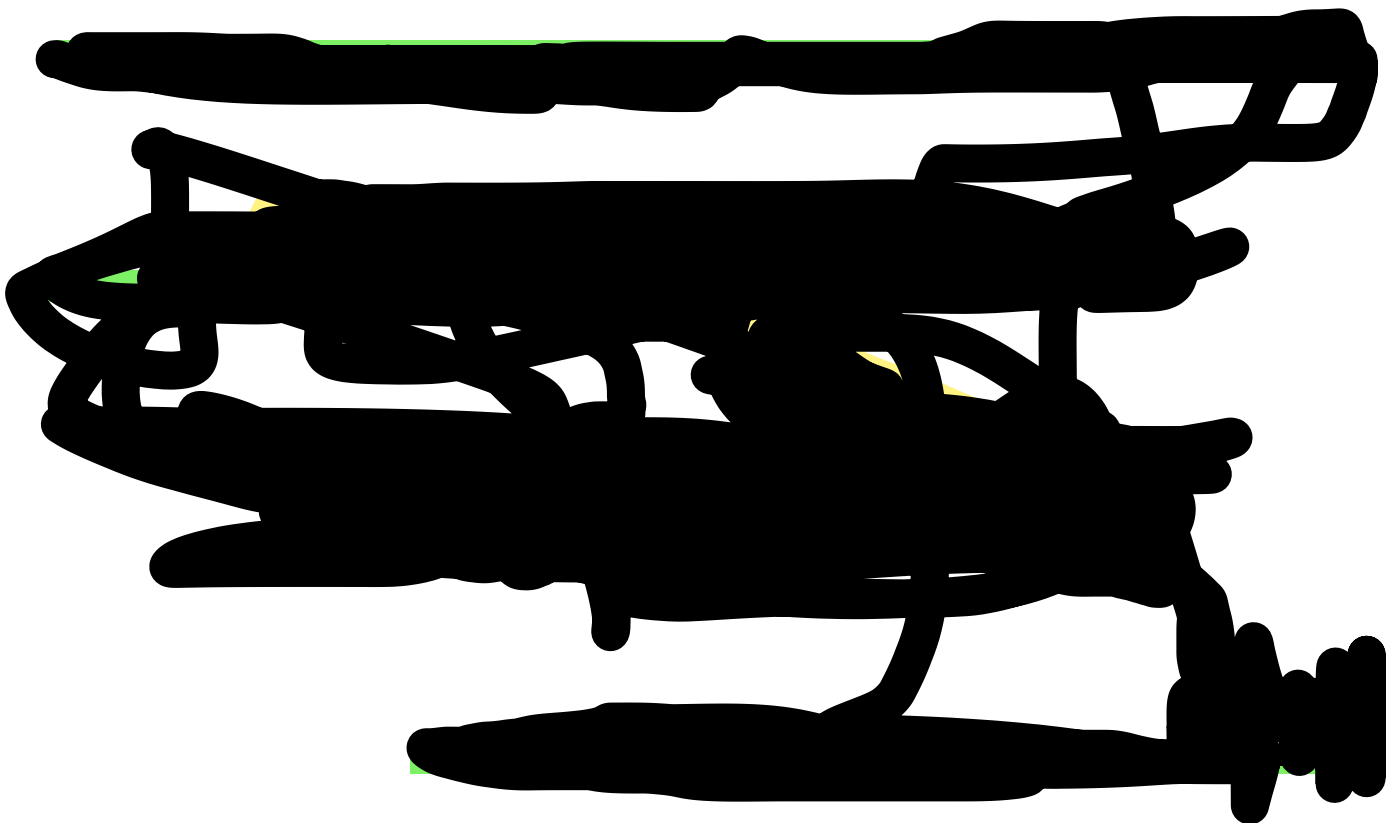


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1. Introduction

The Ministry of Education of Ethiopia has announced the implementation of exit exam for all undergraduate program students (public and private), beginning with the 2022/2023 academic year, in order to improve the quality of graduates produced by higher learning institutions. The exit exam aimed at checking whether students have acquired the required knowledge, skills and attitudes or not. To implement this, it requires determining competency area for specific program, which is already completed based on the competency areas prepared, it needs to plan the construction of tests blue print guideline. The major points considered in the process of preparing this test blue print guideline were the core competencies that have been already identified for the themes of courses, the course contents, course credit hours, and the learning outcomes with their corresponding levels of achievement by learning domains.

In the course of the test blue print preparation, it is vital to note that architectural design, as the main thematic area of the program, is a project based exercise execution. Since the protagonist of architectural design is formation of habitable space [non material] for human use, the methodology of its study requires a three-dimensional imagination and visual illustrations [in the form of physical model or graphic computation] as primary media.

Hence, the test specification preparation for architectural design thematic area should be set in response to the subject's requirements of projective thinking to process, analyze, synthesize and produce using graphical communication to forward a suitable design solution to the questions [presented challenges]. The skill set required to graphically communicate and then logically argue [defend] their intended ideas as well as the translation of abstract idea into graphically projected output require high level of affective and psychomotor learning domains.

In addition to the graphical presentations, the projective product formation also requires prior knowledge and skill of architectural design making. These cognitive learning domains of architectural design formation regarding design analysis, design methodology, standards, notations, symbols and presentation techniques could be incorporated either with the proposed design questions [with high assessment weight] or as a separate question format similar to the other thematic areas.

Therefore, the assessment weight proportion for architectural design challenge [question] shall adopt the curriculum's assessment recommendations.

2. Objective of test blueprint

Test blueprint preparation is generally opted to assist the preparation of a test that is representative, broadly sampled, and consisting of complete knowledge domain expected of the Ethiopian higher education students on completion of their study program. The specific objectives of test blueprint are to:

- Facilitate the construction of a representative and balanced test items for the selected courses in accordance with the competencies identified.
- Guide test developers or writers to write or set appropriate test items.

Generally, test blueprint will help to ensure tests: 1) Appropriately assess the achievement of instructional objectives of the course; 2) Appropriately reflect key course goals, objectives and the material learned or covered during the instruction period; and 3) Include the appropriate item formats along with the knowledge and skills being assessed.

3. Expected profile of the Graduates

Architectural education shall prepare students to be competent, creative, critically minded, ethical professionals, intellectually mature, ecologically sensitive and socially responsible professionals. Architectural education in its very nature has been international and its practice is contextual as well as cross-cultural profession, its program accreditation, as described in the curriculum, the graduate profile has adopted internationally recognized UIA-UNESCO charter's description of professional profile.

Fundamental Knowledge & Abilities of the Profession are:

- An ability to create architectural designs that satisfy both aesthetic and technical requirements
- An adequate knowledge of the history and theories of architecture and the related arts, technologies and human sciences,
- Having Knowledge of the fine arts as an influence on the quality of architectural design,
- An adequate knowledge of urban design, planning and the skills involved in the planning process,
- An understanding of the relationship between people and buildings, and between buildings and their environment, and of the need to relate buildings with the spaces between them based on human needs and scale.

- An understanding of the profession of architecture and the role of the architect in society in particular in preparing briefs that take account of social factors.
- An understanding of the methods of investigation and preparation of the brief for a design project
- An understanding of the structural design, constructional and engineering problems associated with building design,
- 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,
- The design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations,
- An adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning.

Accordingly, basic skills of an architect is classified as scientific, technical & artistic as follows:

A. Scientific Skills:

- Analytical skills
- Organizational and management skills Scientific design skills

B. Technical Skills

- Practical skills
- Know-how on building materials and their construction
- Digital skills Documentation skills technical design skills

C. Artistic Skills

- Techniques for creativity
- Presentation skills
- Artistic design knowledge

D. Behavioral skill and attitudes of an architect

- Critical thinking
- Problem-solving orientated Flexibility and self-directed learning Attention to detail
- Commitment to excellence and ethics

4. General objective of the program

Architecture is an interdisciplinary field comprising humanities, social science, physical science, technology and the creative art dimensions. Architecture is manifested in the ability to conceptualize, coordinate and execute an idea in a careful and creative mediation between reason, emotion and intuition. The basic goal of architectural education is to develop the architect as a “generalist” able to design a habitable built environment often involving potential contradictions between different requirements in response to the society’s need and individual’s environmental needs.

In the increasingly globalizing world, architects should also be trained to not only understand, protect and highlight architectural heritage in their context but also expected to adapt cultural and territorial contexts in which they may be called upon to work.

5. Specific objectives of the program

The specific objective of architectural education is

- To produce competent, creative, critical minded and ethical professional built environment designers/ builders
- To produce professionals who are intellectually mature, ecologically sensitive and socially responsible.
- Providing a solid foundation in the understanding of the reality of economic, cultural and environmental issues in building design
- Training competences to work in team and communicate ideas in the media of language, text, drawing, statistics and models.
- Enabling students to play their role as generalists and coordinator of interdisciplinary programs.
- Implementing efficient tools for permanent quality control, winning back the generalist attitude of the architect’s profession by strengthening competences in the technical field of material and construction as well as in the process of implementation
- Defining closer links between practice and theory as a continuous exchange of needs and ideas between the academic and the professional spheres.

6. Themes and list of courses

While preparing this test blue print specification, the identified competencies and core courses forwarded by the previous document, were reorganized and regrouped corresponding to the nature of these courses [project based courses that are established on training students in projective thinking and study based courses that are established on teaching students in retrospective thinking].

Hence, the five reorganized major themes are:

1. Architecture and Architectural Design
2. Graphic Communications and Visual Arts
3. Building Construction [Building material, construction and Structure]
4. Theory and History of Architecture
5. Professional Practice and Ethics

Therefore the identified core course selected for exit exam are categorized under the above thematic areas.

6.1 Curses under architectural design

- Architecture Basics-Design studio I & II
 - * Architecture Basics-Design I & II
- Architectural Design Studio III & IV
 - * Architectural Design Studio I & II
- Integrated-Design-Project Studio I & II
 - *Integrated Architectural Design
 - *Quantity surveying, specification & Contracts
- Architectural Science I and IV (Heating, cooling and ventilation) & (Acoustics)
 - *Architectural Building System I and IV

6.2 Course under Graphic Communications

- Communication Skills I and II
- Communication Skills III (Visual arts)

6.3 Course under Building Construction [Building Material, construction and Structure]

- Building Materials and Construction I
 - *Construction Material I
- Building Materials and Construction II
 - *Building Construction
- Theory and Design of Structures I
 - *Engineering mechanics
- Theory and Design of Structures II
 - *Strength of materials

6.4 Courses under History and Theory of Architecture

- History of Architecture I
 - *Global History of Architecture I
- Ethiopian History of Architecture
- Theory of Architecture I

6.5 Course under Professional Practices and Ethics

- Professional Practice and Ethics
- * Professional Practice
- Specification and BOQ

Note course name labeled by " * " refers to Adama & Addis *Ababa* Science & technology universities [ASTU and AASTU]

7. Total ECTS /credit hour of the selected courses and share of themes

While identifying the core course representing the program competence, the validation team has taken into account the peculiar curriculum at certain universities and adopted a common ground to accommodate their variations for sake of avoiding duplication of exit exam for graduates with similar nomenclature "Architecture".

No	Themes	Course Names	Harmonized curriculum	
			ECTS	%
1	Architectural Design	Architecture Basics-Design studio I & II	14	14%
		Architectural Design Studio III & IV	14	14%
		Integrated-Design-Project Studio I & II	16	16%
		Architectural Science I (HVAC) and IV (Acoustics)	8	8%
Architectural design theme's total ECTS/ credit hour			52	52%
		Communication Skills I and II	10	10%
		Communication Skills III (Visual arts)	4	4%
Graphic Communications theme's total ECTS/ credit hour			14	14%
2	Building Construction [Building Materials, Construction and Structures]	Building Materials and Construction I *Construction Material I	5	5%
		Building Materials and Construction II *Building Construction	5	5%
		Theory and Design of Structures I	4	4%
		Theory and Design of Structures II	4	4%
Building construction theme's total ECTS/ credit hour			18	18%
3	History and Theory of Architecture	Theory of Architecture I	3	3%
		History of Architecture I	3	3%
		Ethiopian History of Architecture	3	3%
Theory & History of Arch. theme's total ECTS/ credit hour			9	9%
4	Professional practices and Ethics	Professional Practice and Ethics	3	3%
		Specification and BOQ	4	4%
Professional ethic theme's total ECTS/ credit hour			7	7%
Total credit hour/ECTS for selected courses			100	100%

Table 01: Selected Core Courses and their corresponding credit weight

8. Learning outcomes in terms of the three domains [cognitive, affective and psychomotor]

The selected core course's learning outcome is grouped and organized under the three learning domains of cognitive, affective and psychomotor.

Learning Domains	Learning Outcomes /specific objective	Remarks
A. Psychomotor	1. Ability to think and operate three dimensionally	Architecture and Architectural Design
	2. Experiment and developing skill on architectural space notation	
	3. Ability to visualize and experiment on the making of architectural space, program and technology	
	4. Techniques of creating architectural space,	
	5. Demonstration of urban cartography	
	6. Ability to design a building according to a given construction system	
	7. Ability to design a building responding to a given urban site and context	
	8. Graphically illustrating architectural ideas, scale and proportions	
	9. Architectural design in response to climate comfort [natural and mechanical]	
	10. Application of integrated content of construction and structural design with architectural design	
	11. Demonstration of program preparation, analysis and presenting the propose design of buildings	
	12. Skill of small scale and large scale model making as a tool to study spatial qualities	
	13. Experiment and developing skill on architectural space notation	
	14. Ability to visualize and experiment on the making of architectural space, program and technology	
	15. Ability to design auditorium space as per criteria for speech & music	
	1. Ability to sketch simple geometrical objects, plants, simple compositions.	Graphics Communication and Visual Arts
	2. Ability to understand and practice principles, projections and development in descriptive geometry.	
	3. Ability to sketch complex compositions, parts of buildings, flora integrated with buildings.	
	4. Ability to practice advanced projections and development in descriptive geometry.	
	5. Ability to perform graphical analysis of two dimensional and three-dimensional problems.	
	6. Ability to create complex design with chiaroscuros application	

	<div>7. Ability to integrate elements and principles of visual arts.</div> <div>8. Ability to present any design project with appropriate presentation [graphic] media</div> <div>9. Diagrammatic illustration of conceptual framework</div> <div>10. Graphically illustrating architectural ideas, scale and proportions</div> <div>11. Acquire skill on Graphic communication and architectural notations</div>	Graphic Communication s and Visual		
BBAffective	<div>1. Logically explaining and arguing the link between theoretical intension and the projected product in the architectural decision making</div> <div>2. Conceptualization and articulate discussion of architectural ideas</div> <div>3. Imagination and visualization of architectural ideas</div> <div>4. Written justification and explanation of abstract concept</div> <div>5. Evaluation of proposed design [oral or text] against intension</div> <div>6. Ability to imagine, visualize, think and elaborate three dimensionally</div>		Architecture and Architectural Design	
	C. Cognitive			<div>1. Ability to think in 3-dimensional architectural space formation</div> <div>2. Understanding context as external force and its role in architecture and urban scale</div> <div>3. Ability to gather information, analyze and forward architectural proposal in urban context</div> <div>4. Understanding the basic material dimensions of architecture</div> <div>5. Knowledge of interdependence of construction, architecture and urbanism</div> <div>6. Understanding of basic social, urbanistic dimensions of architecture and environmental factors of building design process</div> <div>7. Design process in architecture, method and principles in architectural design</div> <div>8. Critical analysis of programmatic events and by laws in architectural design</div> <div>9. Review on traditional city to modern city</div> <div>10. Understanding the basic human dimensions [anthropometric and ergonomics standards]</div> <div>11. Analysis of multi-functional buildings</div> <div>12. Basic principles in architectural design Aspects of morphology, context, mediation of interior vs exterior architectural spaces, rules and regulations,</div> <div>13. Understanding basic social and urbanistic dimensions of architecture</div>

C. Cognitive	14. Knowledge of interdependence of architecture and urbanism	Architecture and Architectural Design
	15. Understanding of the integration of architectural design, urban design and landscape design	
	16. Advanced understanding of the technological dimensions of architecture with the focus of building science and services	
	17. Knowledge of various interdependence factors in architectural projects	
	18. Application of building science and service in architecture	
	19. Principles of heat, cooling and ventilation	
	20. To identify and understand Architectural acoustics	
	21. Integrating building comfort indoor climate	
	22. Building systems of heat, cooling and ventilation in natural as well as mechanical setup	
	23. Architectural program preparation, analysis and presenting the propose design of buildings	
	24. Review of case studies and interpretation of their findings	
	25. Evaluation of proposed design against intension	
C. Cognitive		
	26. To introduce students to sketching and sketching media,	Graphic Communications and Visual Arts
	27. To identify architectural drawing standards.	
	28. Ability to identify one’s creative and aesthetic desires in visual arts.	
	29. Ability to understand methodologies of visual art history, language of art and stylistic terminology.	
	30. Ability to define exactly the different terminologies used in visual arts.	
	31. To introduces students to the elements and principles of visual design.	
	32. Graphically reading architecture 3 dimensionally	
	33. Graphical ability to analyze activates[hosted events]	
	34. Graphical analysis of programmatic events	
	35. Ability to take a look on the progression of art during the pre- historic times up to the present.	
	36. Detail understanding of building material properties and production process	Building Materials, Construction and techniques
	37. Detail understanding of how various building elements are planned, joined and executed in solid construction systems	

C. Cognitive	38. Classification/characterization of building materials and their origin	Building Materials, Construction and techniques
	39. Representation of building elements, material dimensions and structural concepts	
	40. Basic principles and practices of building with filigree construction	
	41. Understanding of building material’s property	
	42. Detail understanding of how various building elements are planned, joined and executed in filigree construction systems	
	43. Appropriate use of material and construction methods according to the technical requirements	
	44. Knowledge of basic structural systems	
	45. Understanding the internal and external force systems, material property and cross sectional properties	
	46. Impact of structural engineering on architectural design	
	47. Understanding material's structural properties	
	48. Knowledge of cross-sectional properties and dimensions of structural members	
	49. Effects of loads in structural members	
	50. Knowledge on the design of structural members	
	51. How theory is related to architecture formation and criticism	History and theory of Architecture
	52. Fundamental concepts of architecture	
	53. Analyze universal theoretical concepts of architecture as compare to local practice	
	54. Knowledge of architecture and urbanism of pre-historic and ancient civilizations	
	55. Introduction to main cities, world cultures, buildings from ancient time to beginning of industrial revolution and modern movement in architecture along	
	56. Understanding of vernacular, historical buildings and settlements in Ethiopia	
	57. Understanding of modern architecture and settlements in Ethiopia	
	58. History of architecture and settlement from pre-Axumite settlements to modern cities	

	59. Critical orientation towards career in architectural practice	Professional Practices and Ethics
	60. Legal principles of architectural practice and professional code of conduct in building industry	
	61. Discipline of architecture in a society	
	62. Economic and managerial process from architectural office to building site	
	63. Extension of design process to the construction process [understanding building as a process]	
	64. Understanding of contract administration, construction supervision	
	65. Specification writing and preparation of specifications and bill of quantities	

Table-02: Learning outcomes in the three learning domains

9. Share of the Themes/Courses/In terms of Percentage (%)

Themes & Share in %	Competencies/ General objective	Name of Courses	ECTS	Learning Outcome	Learning outcomes																			
					Cognitive							Affective				Psychomotor				Number of items				
					Remembering	Understanding	Application	Analysis	Evaluation	Creation/Synthesis		Characterization	Organization	Valuing:	Responding	Receiving		Naturalization	Articulation		Precision	Accuracy Manipulation:	Imitation	
Architecture and Architectural design (52%) BITEG	- Understand the fundamentals of architectural design; space,program & technology. - Understand context (urban scale) in architecture.	Architecture Basics - Design studio I & II	14	A1,2,3,4,5,8,12 B1,3 C1, 2,3,10	-	1	2	1	-	2			1	-	1	-	-		2	2	2	-	-	14
	- Understand basic material dimensions of architecture, knowledge of the interdependence of construction and composition as well as architecture and urbanism. - Understand basic social, urbanistic dimensions of architecture, the environment and various factors of design and building process.	Architectural Design Studio III & IV	14	A6,7,8,12 B1,2,5 C7,8,10	-	-	1	2	2	-			1	1	-	-	-		1	2	2	-	2	14

Architecture and Architectural design	<ul style="list-style-type: none"> - Understand the integration and interdependence of architecture in bigger scale (urban) and smaller scale (detail designing of the non-space) - Understand the integration of architectural design, construction and structural design 	Integrated-Design-Project Studio I&II	16	A6,7,8,9,10, 11 B1,2,3,4,5,6 C11,12,13,14, 15,16,21	-	-	1	2	2	2			1	1	-	-	-	2	2	2	-	1	16
	<ul style="list-style-type: none"> - Understand building services like, heating, cooling ventilation/air conditioning/ and acoustics 	Architectural Science I & IV	8	C18,19,20,21	-	1	2	2	1	1			-	-	-	-	-	-	1	-	-	-	8
Graphic Communications and Visual Arts	(14%) <ul style="list-style-type: none"> - Develop skills needed for documenting designs using drawings and for performing graphical analysis of two dimensional and three dimensional problems. - Able to utilize mainly manual and instruments to explore, develop, define and communicate a design proposal. - Promote practical understanding and competence in the principles and skills underlying visual and constructional design and problem solving. 	Communication Skills I and II	10	A1,2,3,4,5,6,8, 9,10 C26,27,32,33, 34	-	1	2	-	-	1			-	-	-	-	-	-	2	2	-	2	10

		- Promote practical understanding and competence in the principles and skills underlying visual and constructional design and problem solving.	Communication Skills III (Visual arts)	4	A7, C28,29,30,31, 35	1	1	-	-	-	1			-	-	-	-		-	1	-	-	-	4
THE STR SPECIAL Building Construction [Building material, construction and Structure] (18%)	- Familiar with Basic principles and practices of building material & constructions with detail constructions.	Building Materials and Construction I	5	C36.37,38,39, 40	2	2	1	-	-	-			-	-	-	-	-	-	-	-	-	-	5	
	- Understanding of building materials, construction techniques and structures through practical experience.	Building Materials and Construction II	5	C36,41,42,43	-	-	2	1	1	-			-	1	-	-	-	-	-	-	-	-	5	
	- Knowledge of structural systems, understanding the internal and external force systems, material properties and cross sectional properties	Theory and Design of Structures I	4	C44,45,46	-	2	1	1	-	-			-	-	-	-	-	-	-	-	-	-	4	
	- Design of structural members and structural building systems. - Understand material properties and the impact of the cross sectional properties of structural members.	Theory and Design of Structures II	4	C47,48,49,50	-	2	1	1	-	-			-	-	-	-	-	-	-	-	-	-	4	

10. Test blueprint Table (Table of Specification) for BSc in Architecture

[illegible]

History and theory of Architecture (9%)	Theory of Architecture I	3	$3/9=0.333$	$0.333*9=3$	-	1	-	1	1	-	-	-	3
	History of Architecture I	3	$3/9=0.333$	$0.333*9=3$	1	1	-	1	-	-	-	-	3
	Ethiopian History of Architecture	3	$3/9=0.333$	$0.333*9=3$	1	1	-	1	-	-	-	-	3
	Theme four total ECTS	9											
Theme five share = 17% Professional Practices and Ethics (7%)	Professional Practice and Ethics	3	$3/7=0.428$	$0.428*7=3$	-	2	1	-	-	-	-	-	3
	Specification and BOQ	4	$4/7=0.571$	$0.571*7=4$	1	2	1	-	-	-	-	-	4
	Theme five total ECTS	7											
Total ECTS for the program		100			6	17	15	13	7	7	7	28	100

Table-03 Test blueprint Table (Table of Specification)

11. Conclusion

Exit examination can have a vital role in ensuring the quality of graduates. It also helps in improving academic program quality and effectiveness. Furthermore, it can create the platform for cooperation among academic programs in different universities to work jointly to improve the programs quality.

Based on identified graduate profile, competencies and learning outcomes Fifteen [15] courses were selected to evaluate the competency of architecture program graduates. This exit exam test specification is prepared to assist the preparation of tests that is representative, broadly sampled and consisting of all learning domains expected in completion of Architecture program in Ethiopian higher education.

For successful competency evaluation of the students' achievement, the exam question should target the specifics of their learning outcomes. Hence, Architectural design thematic areas is subjective in its nature mainly due to the affective domain's reasoning and intensions applied to construct the psychomotor domains. Exit exam contents of such subjectivity nature require formulation of questions should not be multiple choice, but rather in the form of short answers, essay, cases, responding to presented design challenges [probably in the form of quick design]. The assessment method of such subjective nature of the courses makes it difficult to evaluate using only objective criteria's of cognitive domain. Therefore, it is highly recommended to use a group of jury member's /committee/ comprising three teachers with architectural design background as evaluators. The score point will be the average between the three evaluators. The evaluation shall also be executed independently and anonymously while assigning evaluators in order to avoid unwanted partiality