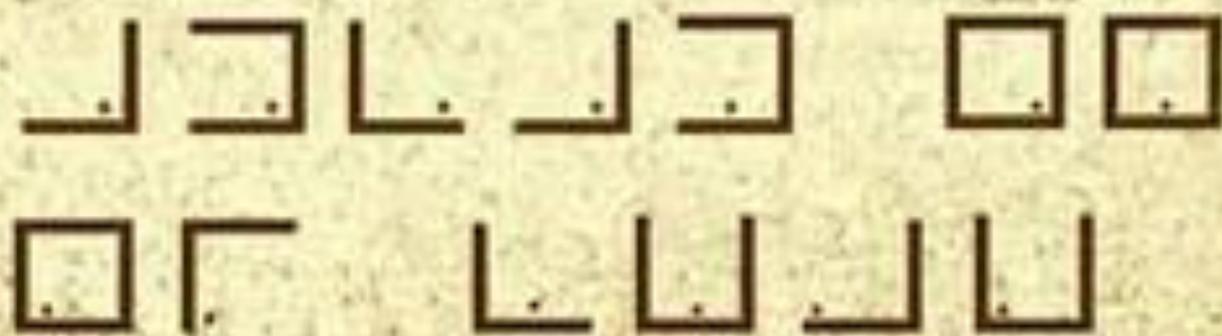
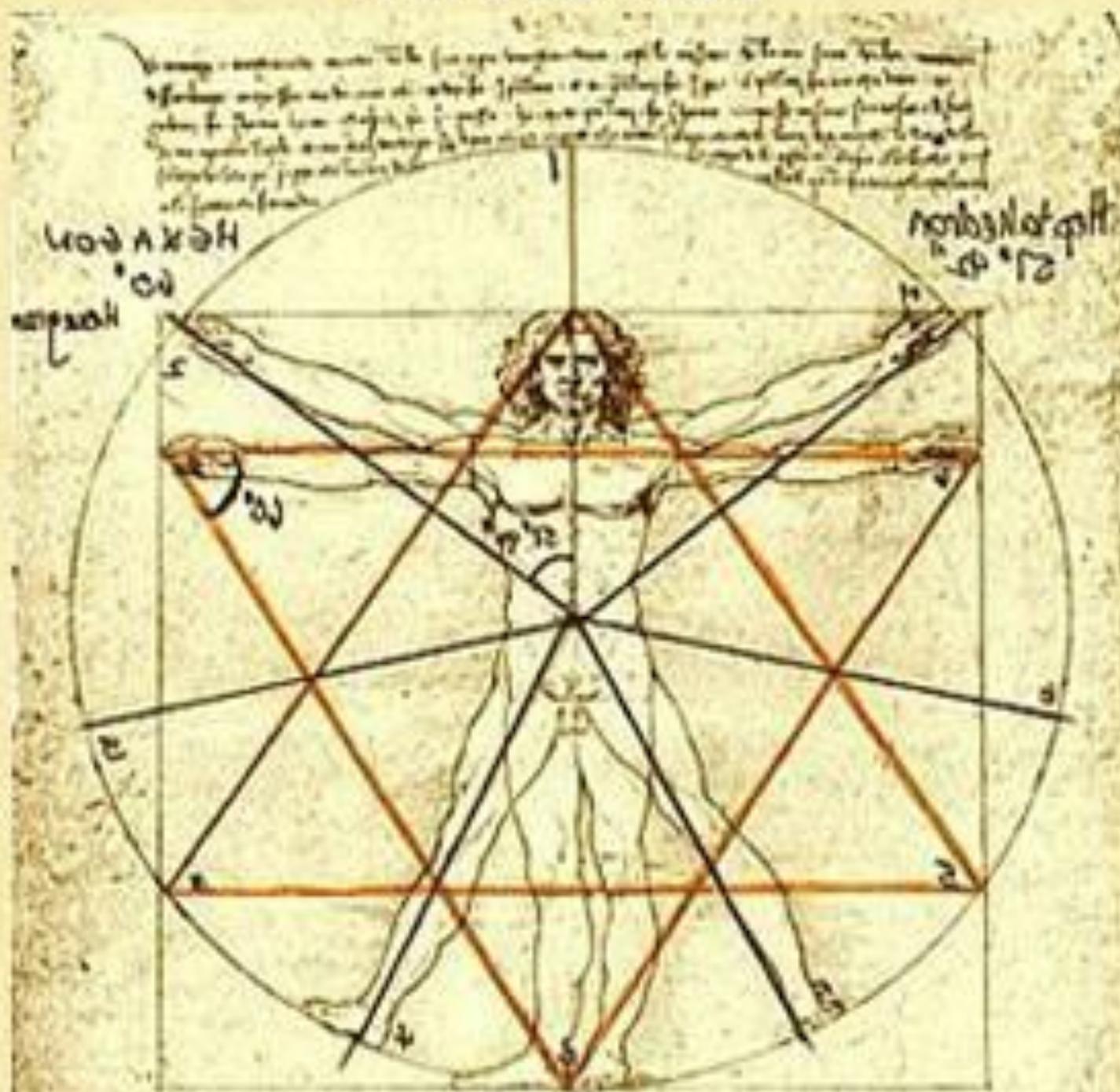
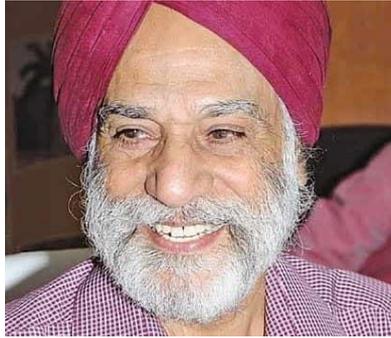


ARCHITECTURE TEACHING LEARNING WAY FORWARD



AR.JIT KUMAR GUPTA
DR. RASHMI ASHTT

FORWORD



ARCHITECTURE fulfils one of the three basic human needs, SHELTER; the other two are: FOOD and CLOTHING. Shelter has preceded Architecture by many centuries as the Art and Science of making “The Objective Outer World of Matter”. In other words, Man set foot on the road to civilisation when he stepped out of the cave to make his own Shelter with his own hands. That is reason enough to say that “architecture is the matrix of civilisation”.

Of Architecture there are definitions galore. Every architect defines it in their own way. Thus there are as many definitions as there are architects in the world. However, I have come up with my own definition that is different from all others for four reasons: one, it is in Urdu original; two, it is in poetry; three, it is in two languages—Urdu and English; and four, in my definition of it, Architecture speaks for itself.

Urdu Original

*Khalvat kee fizaaron mein karoon
jalvatein paida Jo khaak mein
pinhaan hain woh hon sooratein
paida Utroon main lahoon ban ke rag-
i-sang mein jis dam*

Hon Taj-o-Ajanta see haseen mooratein paida

English Poetic Rendering

In desolate Emptinesses I'm creating
Habitations Forms that lie hidden in dust
become Manifestations When I course like
blood thro' the veins of Stone Taj-'n'-
Ajanta emerge as Beautiful Configurations

Years later I developed the above quatrain [4-line verse] into a sonnet [14-line poem invented in Italy] to express other important aspects of the Great Mother Art: **Architecture**. The first four lines of the sonnet are of the original quatrain.

SONNET

*In Space's wildernesses "I" create
habitations all alone Forms lying
hidden under dust become
manifestations When, like blood, I
course through the veins of stone Taj
'n' Ajanta emerge as beautiful
configurations*

The “I” in the verse stands for Architecture,
that's “Me” Of three Elements is my whole

being constituted Space, Structure, Form,
with Time's own validity Though, the
Mother Art, I am usually prostituted
Ill-gotten money is lavished on me to
express power Of the corrupt and self-
styled leaders of fine taste
They raise awesome monsters with pediments
'n' tower What they call Beauty is actually a
criminal waste Through me some poetic Mind
does express the Divine But, in other cases,
it's like casting pearls before a swine

The inviolable importance of ARCHITECTURE, as the “Mother of all Arts”, becomes crystal clear, when we know that it was Lord Vishwakarma who created the Universe although the three principal gods of Hindu Mythology: Brahma, Vishnu, and Mahesh possessed the powers of Creation, Protection, and Dissolution, respectively. And Lord Vishwakarma, as the CELESTIAL ARCHITECT, employed only two elements: Space and Time—and the three stated primary functions of Brahma, Vishnu, and Mahesh have been going on, ever since the Universe came into existence, endlessly...in self-renewing cyclical order.

The Spanish genius **Antoni Gaudí**, the greatest exponent of Catalan modernism [*Modernisme*] besides his architecture classes, studied French, history, economics, philosophy, and aesthetics. He learned early in his career that opening one's mind to the nature, content, and scope of diverse disciplines.

His engagement with Structure as an armature for architectural form led him to develop a design methodology that is unique in the history of Modern Architecture.

According to AD Raje who was closest to him during his stay in Ahmedabad, **Louis I Kahn** was teaching all the time ... in school, in the office, at the building site and in conversations. There was hardly a time when he was not talking about his values, attitudes, realizations, and architectural philosophy, conveyed in simple terms.

Look at how Kahn got talking to a brick to figure out what structural form it naturally prefers:

“If you think of Brick, you say to Brick, ‘What do you want, Brick?’ And Brick says to you, ‘I like an Arch.’ And if you say to Brick, ‘Look, arches are expensive, and I can use a concrete lintel over you. What do you think of that, Brick?’ Brick says, ‘I like an Arch.’ And it's important, you see, that you honor the material that you use.

You can only do it if you honour the brick and glorify the brick instead of shortchanging it.”

Kahn's example is inspiring because he is the only world class architect who spent a lot of time with the students in their design studios. When somebody asked why he was wasting his time he proudly declared I go to teach and learn from my students how to design better and better.

I call Louis Kahn the Mystic of Architecture in which sense other masters are nowhere near his enviable achievements.

Gio Ponti, a versatile Italian, has achieved fame as an *architect*, industrial designer, artist, poet, author, editor, and publisher. Simultaneously with his architecture, he was active in painting, the graphic arts, design for motion pictures and the theatre—including costumes and scenery for Milan's La Scala opera—and interior design. His book *In Praise of Architecture* is a stimulating, entertaining collection of highly personal observations about *architecture* and life, which to the author are *inseparable*.

The allegory of crystal is derived from a Geo-Ponti quote in which he states: *“It is not volume that makes **architecture**, but its closed, finished, immutable form.”*

His reverence for the past as informant of the future, and Ponti's extensive research into international architecture and design cultures synthesized when he founded the influential architecture magazine *Domus* in 1928. The magazine, which celebrated its 45th anniversary at Paris's *Muse des arts*

décoratifs in 1973, is highlighted in *Tutto Ponti*, and can be considered one of Ponti's masterpieces. It served as a platform to explore all forms of creative expression, introducing its Italian readership to international design.

Ponti published hundreds of articles and featured works and texts by other designers, Italian and foreign, in *Domus* that quickly became a meeting-place for international ideas as well as a vehicle for the promotion of modern design. By the end of Ponti's career, the publication had developed into a multilingual magazine with a global readership. Taking as his starting point the premise that 'the house ... should not be *in* fashion, for it should not go *out* of fashion', Ponti curated *Domus* aimed at an audience that was cultured but not necessarily specialised, all the while disseminating his inexhaustible interest for the new.

Apart from Geo Ponti's marvellous architectural works his contribution as a pioneer of Architectural Journalism is of seminal import.

It is a rare honour for me that my article on Chandigarh's Rock Garden was featured in this internationally acclaimed magazine.

Pier Luigi Nervi, Italian engineer and architect, said: "*Beauty does not come from decorative effects but from structural coherence. Formal beauty and technical perfection are inseparable.*" He was internationally renowned for his technical ingenuity and dramatic sense of design especially as applied to large-span structures built of reinforced concrete. His important works include a prefabricated 309-foot-span arch for the Turin Exhibition and the first skyscraper in Italy, the Pirelli Building in Milan, which is a collaborative design with Gio Ponti.

Along with his professional work as engineer, architect, and builder, Pier Luigi Nervi was also an adjunct professor at the University of Rome and a prolific writer. Through his writings, his views on architectural history can be traced and framed as part of a wider discourse concerning what he termed architectural 'constants'. Moreover, his interest in the architecture of the past led him to identify what could be defined as 'architectural resilience', that is, an ever-evolving relationship between building forms, techniques

and materials. Seeing technique as preceding form, he examined structural elements that resisted the passage of time and outlasted building typologies and styles.

Nervi is a solitary example because he as a Structural Engineer of far-reaching consequence took pride in being addressed as an "Architect".

Felix Candela, Spanish-born architect, was an awesome creator of reinforced-concrete (ferro-concrete) structures distinguished by thin, curved shells that are extremely strong and unusually economical. The symmetrical plan and innovative use of "V" beams allows edges free of stiffening beams, revealing the radical thickness of the 4cm (1 ½") shell. Compare it the Legislative Assembly hyperbolic paraboloid which is also supposed to be a shell structure but has an average thickness of 6 inches (15.24 cm).

In my view, Candela's extraordinary Engineering was marvellous Architecture which, in turn, was Structural Art unprecedented in history. He created marvels when computers were unheard of for engaging in awfully complex and complicated structural design calculations.

Eduardo Torroja, a Spanish structural engineer, was a pioneer in the design of concrete thin-shell structures. His Philosophy of Structures is a Bible that exalts matter-of-factness of Engineering to the aesthetic mystique of Architecture thereby belying the dictum of Walter Gropius that "Architecture begins where Engineering ends". His design for the grandstand at the Zarzuela racecourse has shell roof that cantilevers out some 43 feet (13 metres).

I am wonderstruck at his genius and daring to try a cantilever of such dimensions when there was no way of fore-checking of its structural safety.

Oscar Niemeyer (December 15, 1907 – December 5, 2012) was one of the greatest architects in Brazil's history, and one of the greats of the global modernist movement. After his death in 2012, Niemeyer left the world more than five hundred works scattered throughout the Americas, Africa, and Europe. As the longest-lived architect in Modern History, Niemeyer was a revolutionary of modernism, with an architectural language characterized by audacious curves and elaborated structures. He established an

architectural vision of a future utopian Brazil, one that ultimately has not come to pass.

For the use of Primary Geometrical Shapes in the unmatched development of Modern Aesthetic Oscar Niemeyer outclassed even Le Corbusier. I call Niemeyer the Lyricist of Architecture.

To wind up this brief discourse, I would rather go back to my first poem titled the “*Why, What, When, Where, and How of Architecture*” that was published in the Journal of the Indian Institute of Architects [JIIA] in 1960s, and re-published three decades later because the Editor rummaging through the archives had stumbled upon it and found it irresistibly interesting to deserve a repeat appearance in the Institute’s prestigious Journal.

I take pride in the fact that I carry the family legacy of architecture and allied disciplines since the reign of the Mughal Emperor Aurangzeb [1799-1849 CE] when my ancestors had built the Badshahi Masjid [the Royal Mosque] at Lahore. My father Sardar Balwant Singh Bhatti, a self-taught professional of amazing versatility had designed, among other buildings, two historic Gurdwaras of the Sikh Faith: Gurdwara Panja Sahib at Hasan Abdal [now in Pakistan] and Takht Sri Kesgarh, Anandpur Sahib.

At the time of writing the stated poem [which shall never age] I was Associate Professor of Architecture at Chandigarh College of Architecture, a founder-teacher with 3-4 years of experience. CCA had been established on 07 August 1961 at the behest of Le Corbusier who wanted it to be the Academic Wing of the Great Chandigarh Experiment in Modern Urbanism that he was then leading with a team of Pierre Jeanneret, Maxwell Fry and Jane Drew.

The six adverbs “*Why, What, When, Where, and How*” used in the poem condense as much Metaphysics of Architectural Creativity as possible that a creative individual, with abiding passion, interest, and insight in the art and science of Building Design, can expand into an entire book.

Why spells the *raison d’etre* of Architecture.

What stands for its content and form.

When alludes to the time-period of its conception, design, and construction with its inseparable connection with the past as history and the future as aspiring formulation of hope-fulfilment.

Where denotes the geography of the place covering the natural and the built environments providing an inescapable context to the Act of Creation.

How compresses in a single word the materials, methods, means, technology, and what have you.

Applied to *Architectural Education* these six adverbs, respectively, mean the reason why you have a certain syllabus, teaching, and examination schemes; the content of the coursework; at which level of the total duration a given programme is offered; the classroom instruction, design studio guidance, and workshop supervision constitute the ‘where’; and ‘how’ covers the methodology encompassing lectures, seminars, site visits, study tours, discussions and debates, and interaction with accomplished professionals from diverse fields.

If an earnest pedagogue uses these six adverbs intelligently, as suggested, and deploying his analytical discernment vis-à-vis synthetic comprehension, approaches the foregoing examples that are my quick sketches of the select greats’ awesome architectural creativity, he would assuredly have a complete programme of Architectural Education covering the Theory, Practice, Research, and Pedagogy of Architecture.

In addition to what I have outlined before, it is absolutely necessary to dwell in the teacher as well as in the student the following non-graphic skills: Listening, Speaking, Reading, and Writing. And the graphic skills of Observing and Sketching, Measuring and Drawing must also be cultivated. A good speaker must first be a good listener just as a worthwhile writer ought to be an avid reader in the first place. In the visual field, unless you keenly observe what is what and how one object is related to the other in terms of size and placement you cannot sketch anything right. Keen observation whips your appetite for knowing more and more and progressively more precisely about what catches your fancy and interests you deeply thereby goading you on to measure and draw it. Observation is thinking with the eyes and instantly freezing it as an image in your visual memory.

To my knowledge, all forms of Creativity are often explained on the analogy of Human Biology, which I have tried to extend to what may be called the pre-conception stage of “birth”, from where it is developed to full blossom through pre-natal [gestation], natal [lactation], and post-natal [nurture] stages. This would definitely help in putting under check all tendencies of speculation about the “origin of things”, as we see them today, and yet classifying the total material under study into distinguishable categories whose common source is possible to pin down. This must have been the reason which prompted scholars to class the members of species, *Homo sapiens*, under four distinct races, although all human beings are made of the

same material, have the same constituent organs, and bear similar human forms.

I have identified the Elements of Building Design as Space, Structure, Form, and Time. **Space** is Purpose-specific, and the purpose, especially in Religious Architecture, comes from *The Source*: the sacred Scriptures of a particular community. The concept of **Space** thus cannot escape the colour and overtones of a given culture. Christianity and Islam are based on the idea of “collective worship”, but Hinduism is not. Thus, a church or a mosque can never be like a *Mandir*. The Sikh Faith also approves of collective worship (*sadh-sangat* or the holy company) but it is also conscious of the fact that the scale of the shrine must not become awesome in deference for the Religion’s Cardinal Principle of Humility.

Structure, as support system, is a physical attribute of all that occupies Space, and is indispensable to the realisation of an idea (in the mind) into an image in the design studio, and thence into an object (building on ground). Though it can be *customised* to meet the peculiar requirements of Space, **Structure** is essentially *universal*. It is the Grammar of the Language of Building Design. The intent and content of this unique language come from Space, and its expression is made possible by Form.

Building Design, realised on site, becomes psycho-somatic in terms of Space and Form.

Form is the third dimension of Plan that “generates” [as Le Corbusier put it] the Space on a sheet of paper which has only two dimensions. Form is the Body of Building Design. Form, with its elements of Mass and Surface, tends to become Culture-specific, too. **Form** is what qualifies Building Design to be classified as a “visual” or “plastic” art. So strong is Form’s visual impact that a vast majority of historians and scholars tend to mistake it for the final arbiter of what, in common parlance, is called **Architecture**.

Time is the most potent single Element as much of Creativity as of Life on this planet Earth; so much so that Time creates its own Space! At any given point in the course of history, Time can be seen frozen as *objets d’art*. In its Present, it is fluid, and, as Future, it tends to be nebulous or gaseous. Albert Einstein called Time as the Fourth Dimension of Space. To my understanding, Time has its own two dimensions: its linearity and its cyclicity. The two together constitute a *helix* which encompasses, as well as dwells in the void or vacuity to create Time-Space Continuum. It should be evident that a proper study of Time as Historical Periods alone can yield material whereby one may *contextualise* both the “Act of Creation” indulged in and experienced by architects and its myriad products called *objets d’art*—Architectural Marvels.

Each Element of Architecture has an implied function as briefly elucidate below.

SPACE accommodates.

It is a measure of Utility: use-effectiveness, making activities efficient, with flexibility for exigencies.

Utility serves.

STRUCTURE supports.

It is a measure of Economy: optimal deployment of resources with respect to Utility.

Economy saves.

FORM expresses.

It is a measure of Beauty: harmony and well being.

Beauty elevates.

TIME creates its own space.

It is a measure of Appropriateness.

Time contextualises.

Space is the Spirit called
ARCHITECTURE. It is what you do
not see as much as you feel.

Structure is the Skeleton called ENGINEERING.

It is what you neither see nor feel as much as you ought to.

Form is the Body called AESTHETICS.

It is what you do not feel as much as you see.

Since TIME is the most formidable Element of as much of Life as of the most marvellous human Creativity, Architecture, let me say something about its enigmatic aspect, FUTURE. Future that comes in the form of a TOMORROW is a geographical fact—the result of Mother Nature’s routine activity of rotation and revolution. However, the FUTURE that we all crave to see as a changed world in which each individual human person would discover their innate creativity and be inspired to develop it to full potential is what the rarest of rare people blessed by God create TODAY, using their divine gifts as a habit of the mind. Such indeed is the true FUTURE that could be better in every way for our collective Living, Working, Recreation, and Movement—all packaged in a dynamic Built Environment.

Architect-Planner JIT KUMAR GUPTA [CCA: 1964-1969] was my student at CCA. He has a winsome personal credo and an unswerving professional work ethic that he has followed throughout his 51-year-long career more as a habit of the mind than in spasms of an effort of will. Right from his student days at CCA, he had showed signs of this self-culture and disciplined lifestyle. During the Indo-Pakistani war of 1965, NCC Training was made mandatory for schools and colleges in the country, and NCC cadets were the second line of defence. The National Cadet Corps [NCC] is the youth wing of the Indian Armed Forces. I was given the charge of this additional work from the faculty side. Jit Gupta by virtue of his meritorious previous NCC Training was made Under Officer of the CCA NCC Unit. It was then that his qualities of leadership and disciplined life came to my notice.

Gupta is well versed in Architecture, Urban Planning, Architectural Education, Policy Planning, and Planning Legislation. He holds B Arch degree in Architecture; Master’s in City and Regional Planning; Master’s in Public Administration; LLB; Diploma in Gandhian Studies, and Advance Diploma in Urban Management, UK. He is founder- Director of the College of Architecture, IET Bhaddal; Past-Adviser Town Planning, PUDA, Past-Chief Town Planner, SPCL. Regardless of the post that he had held at any given point of time it was his hunger for knowledge acquired at firsthand in scores of national and regional seminars and public lectures that set him apart from innumerable co- professionals. As a practitioner he won over his political and bureaucratic bosses with his sound knowledge and sage counselling. As a pedagogue he earned the respect and affection of his students and the teachers alike. He has won several awards and honours but there is not even the faintest trace of arrogance in his demeanour. He is an ideal teacher of architecture.

In the **Introduction** to the eBook, “**Redefining Future of Architects and Architecture in the changed context of Architect’s Registration under Indian Architects Act**”, he writes: *Juxta-positioning four major fields of human endeavour involving; Humanities for thinking, Science for exploring, Art for expressing, and Technology for inventing; as integral part of architectural professional education and practice, has led to the acceptance of architecture as one of the most iconic, unique and multi- disciplinary profession. Amalgamation of four distinct fields of humanities, art, science and technology has also led to creation of spaces, environment, structure and monuments, which continue to define the growth trajectory of homo-sapiens since their inception on planet earth. Also called the matrix of human civilization – Architecture is known both as definer, authentic measure of the social status and an evocative expression of the ethos of an era to which they belong. It is widely believed that when conserved, buildings are known to create heritage but when in ruins, they become archaeology.*

From the foregoing text, I feel assured that Prof Jit Kumar Gupta is extending the tradition nascent in my ideas that I have been religiously developing since 1961. In doing so, he is reaffirming his loyalty to the great Indian tradition which I proudly call and celebrate as HOLISM—and his alma mater, a peerless premier institution established by the twentieth century’s greatest architect Le Corbusier when three other greats, namely, Pierre Jeanneret, Maxwell Fry, and Jane Drew, were right here on Chandigarh site.

Dr Rashmi Ashtt says, “*The book brings out the fact that, imparting a high-quality Architectural education involves a sensitive and a balanced thinking with intense work and involvement in producing a methodology which justifies the versatility of knowledge and skills required to create intelligent and competitive Architects Globally.*” I have never met her but I have full faith in Gupta’s sagacity by virtue of which he makes his choices that seldom go wrong.

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

The eBook titled *Making Teaching and Learning of Architecture Qualitative - Issues and Options* is a comprehensive document covering as it does Architecture and Allied Disciplines in the larger context of societal concerns vis-à-vis the normative-prescriptive guidelines of the Council of Architecture for Architectural Education in India. To my knowledge, this should be a pioneer work of insightful scholarship and futuristic aspirations which we all have as followers, practitioners, researchers, teachers, and promoters of Architecture, the Great Mother Art, creatively using it as a courteous contraption of collectively inventing the future for humankind.

Even at the cost of sounding self-recommendatory I must say I have published several books which can come handy to earnest learner regardless whether he is a teacher or a student to fuel, support, and sustain his self-study to become a holistic professional. Out of these the one titled “*ARCHITECTURE: Theory Practice Research and Pedagogy*” should be especially advantageous to read and absorb. It was published in 2017 by White Falcon Publishing Solutions, Chandigarh.

Be that as it may, I have been toying for a long time with what my detractors call “outlandish ideas” that I have zealously propagated. Their keynote assertion is that the next Revolution would be in Architecture. If that be so, this eBook is promising in its content and form to contribute its mite to the making of revolutionaries who would enthusiastically transform my ‘wishful thinking’ into a pulsating reality in the years to come and put India on the vanguard of a creative uprising.

CHANDIGARH, 12 November 2020

—**Dr SS Bhatti**

PREFACE



Known as an avocation, science and an art, Architecture, as a profession is basically and essentially, involved with creation of state of art-built environment. As promoter of health and well-being, architecture is known for making value addition and enriching human living, both aesthetically and spiritually. Marcus Vitruvius, the great Roman architect and author of the treatise *De Architecture* refers, “*firmness, commodity and delight*”, as the basic traits of Architecture.

Despite being practiced from the day homo-sapiens came on this planet, recognition of Architecture, as a profession, has only been recent. Formal education in architecture in India also had its origin with the opening of Sir J J College of Art and Architecture in Mumbai in the earlier part of 20th century. With profession and practice commanding a better acceptance in the post- independence and post- liberalisation period, large number of institutions imparting education in architecture came up in various parts of the county.

Known for their close relationship between education and profession, quality of education has to be always evolving and devolving to remain relevant to the needs, ethos and objectives of the profession and society, Liberalization, globalization, fast changing construction technologies, new found materials, rapidly changing architectural vocabulary, ever expanding building footprints and new design strategies, have created numerous challenges to the profession and the professionals in recent past. Moreover, the Government of India has introduced the National Education Policy 2020 and the World is facing Covid-19. Accordingly, there is need to find and discover new order and pattern of architectural pedagogy to meet these challenges effectively and efficiently.

Prevailing architectural education, having genesis in the old schools of western thoughts, needs detailed study, analysis, rationalization, review and redefinition to make it more relevant to Indian ethos, culture, environment, ecology, climate and needs of multi-layered society and communities in order to make it distinct and unique.

Accordingly, there is need to skilling students and creating core competencies to enable them to meet the emerging challenges in the domain of the built environment for evolving state of the art architectural solutions through connecting with people, places and ecology. Contours and wheels of architectural education need to be reinvented for making architectural pedagogy relevant.

Considering the need for rationalising and redefining the architectural education, I feel the eBook , ‘Architectural Teaching Learning in India- Way Forward’, by Ar Jit Kumar Gupta and Dr Rashmi Ashtt, provides detailed insight into the entire gamut of prevailing pattern of architectural education in India, challenges faced by the educational institutions and options which can be exercised to make education more relevant and qualitative. Ebooks looks at large number of issues linked with education, educational institutions, registration of architects, regulations governing the architectural education, role of statutory authorities in regulating the profession and education etc. It also defines the global practices followed in imparting architectural education and registration of architects.

Looking at the intent, content and coverage of the eBook, ‘Architectural Teaching Learning in India- Way Forward,’ I would like to congratulate the authors, Ar Jit Kumar Gupta and Dr Rashmi Ashtt, for bring out the book and making valuable contribution in the domain of architectural education. I feel eBook will be a useful reference document for the students, faculty and researchers to better understand the entire context of architectural education and evolve appropriate strategies to make architectural education more qualitative, focussed and relevant to the society, environment and resources.

Chetan Vaidya

Former Director of School of Planning and Architecture (SPA) New Delhi

PREWORD



Education remains critical for skilling, growth and development of any community, state and nation on sustained basis. Education is said to make a society more knowledgeable, happy, prosperous, self-reliant and innovative. A man without education has been compared with a building without foundation. The true purpose of education is to make minds grow and not merely making careers. If education has great relevance for any community and nations, then quality of education imparted remains equally relevant for achieving the real aim of education.

Positive co-relationship has been found to exist between quality of education imparted and quality of human beings created . On that analogy, quality and proficiency of any profession is also known to largely depend upon the quality of professionals manning the said profession. Further, quality of professional is known to depend upon quality of education imparted. Accordingly, quality of education imparted becomes critical and highly relevant for the rational growth and development of any profession besides making it more qualitative, effective, efficient and relevant to the needs of the society and community ,it is intended to serve. This premise holds great relevance for the state of art and quality architectural education for creating pool of most talented, skilled, innovative and dedicated manpower in the domain of architecture.

Architecture, as a profession, engaged, primarily and essentially, in creating built environment, is known to have large connotations for promoting environment, preserving bio-diversity& ecology, promoting sustainability and creating optimum indoor living conditions for users through minimising use of energy, water and non-renewable resources besides generating minimum waste. Buildings are also known to promote sustainability by minimising global warming and reducing carbon footprints. Accordingly, creating sustainable, healthy, cost-effective and resource efficient buildings assumes vital importance. This calls for making our architectural education both qualitative and relevant so as to create quality and sustainable buildings. The issue becomes all the more important considering the fact that India needs to create on annual basis buildings to the extent of 700-900 million square metre of built space to meet the ever growing demand for shelter, working, education, healthcare, entertainment, trade and commerce and industry due to rapid urbanisation and rural-urban migration.

Considering the role and importance of making architectural education qualitative, this eBook titled, ‘ Making Teaching and Learning of Architecture Qualitative- Issues and Options’, is an attempt to bring out the existing status of architectural education in India and issues creating roadblocks in promoting the qualitative teaching-learning of architectural education .In addition, eBook also tries to list the possible options for making the education, both qualitative, effective and relevant to address the local and global issues.

The eBook is a compilation of the articles written at different times and at different contexts and accordingly may contain overlap, repetition and duplications at certain places. Repetitions made in articles show their relevance and importance in the context of architectural education and should be considered accordingly. Views expressed are merely personal and are based on my involvement and understanding of the architectural education for the last more than 33 years. If there are any contradictions, that can be attributed to my limited understanding of the profession and professional education

Architectural education remains highly complex due to involvement of large number of other professional skills required to support the profession. Accordingly, the issue has been debated and under discussion intensely since its inception. Method of imparting architectural education has been historically undergoing change in its intent, content, scope and delivery. Process has remained ever evolving and devolving, considering its dynamic nature.

Indian Architects Act, has also been defining the context of architectural education and making it both qualitative and relevant through enacting, Minimum Standards of Architectural Education, which was done first in the year 1983 and which have been redefined recently in the year 2020. New Education Policy, 2019, evolved by the Government of India, is also trying to redefine the contours of education in India, to make it both local and global

besides skilling India and making it relevant to fast changing needs of self-reliance, localisation, globalisation and liberalisation of economies besides addressing challenges and agenda defined in the SDGs by the UNO.

In the making of this eBook, I would specifically mention the important role and wonderful contribution made by Dr Rashmi Ashtt, Director /Principal of Hindu College of Design, Architecture & Planning, Sonapat, from time to time. She has been a constant support in writing number of articles with her intimate knowledge, understanding and experience of the architectural teaching and learning. If eBook has some relevance for improving the quality of architectural education, majority of the contribution can be attributed to her thoughts, writings and experience in the area of architectural education. I would like to specifically acknowledge her passion for teaching and making architectural education both qualitative and productive in the real sense of the term.

This is the fifth eBook by the author, first eBook, 'Planning and Designing of the State of Art Healthcare Facilities,' was dedicated to the healthcare sector; whereas second eBook titled, 'Making Cities Great Places to Live', showcased the options for state of art planning the cities to make them great places live besides making them more liveable, safe, resilient and sustainable. Third eBook on, 'Housing for All I India- Myths and Realities,' focuses on the issues and roadblocks in creating adequate housing in India and define options to achieve the goal of housing for all in India. Fourth eBook dedicated to heritage titled – Managing Unique Heritage of India- Issues and Options' takes a look at the existing status of heritage and tries to define a framework for its conservation and preservation. This fifth eBook on; 'Making Teaching and Learning of Architecture Qualitative- Issues and Options,' has its focus which revolves around understanding the entire gamut of architectural education and looking at ways and means, for making it more qualitative and productive both for students, faculty and institutions. I hope this eBook will help better understanding of the entire context architectural teaching and learning in a holistic manner.

Ms Priyanka Sagar, student of Final Year B.ARCH of IKG PTU Campus Mohali, deserves my gratitude and appreciation, for the valuable support given in compiling the articles and making this eBook, despite her pre-occupation with final year studies. Her passion for hard work, combined with sincerity and dedication, has made this book a distinct reality. Design of the cover page and images in the eBook are the outcome of her hard work and understanding of the context of articles and end the eBook.

I would like to dedicate this eBook to the sacred memory of my mother, Late Smt Leela Gupta, who as a teacher made me study architecture despite having limited understanding of the profession in early sixties. She made me where I stand today, despite all financial odds and hardships she faced in bringing me and educating and to my father Late Ved Parkash Gupta, whose benevolence I was deprived off, in my early childhood.

Jit Kumar Gupta
Chandigarh
August 27, 2020

PREWORD



To Dream and Achieve becomes possible with Education as a weapon. Education is needed not only on personal level but on global levels also for a better development of mankind, the natural and the built environment. Further, the education quality is reflection of the developed world and civilization. Quality education produces intellectuals and successful personalities. Any Profession grows and flourishes if the education provided is upgraded to paramount levels. The same holds good for Architecture as a profession to make it Prolifer.

Architecture is a multidisciplinary and versatile field which awakens the latent creativity of an individual so as to appreciate aesthetics, functionality and techniques involved in a built creation. Sharing the same platform, it also gives an understanding of socio-economic dynamics for overall urban development. It infuses philosophies that can change the art of living. Architecture as a profession today offers a numerous opportunities to today's youth to achieve success and satisfaction in life. Architecture requires a team of specialised professionals with the architects being one of many, although usually the team leader. An architect is the one who, through his immense creativity and technological skills, can amalgamate environment, sustainability and cyber technology to create a building like a living organism which is capable of identifying and addressing its needs. Architecture is a very satisfactory and noble profession, contributing to the development of Nation, safety of environment, and giving dignity to the professionals involved.

The e-Book titled, ' Making Teaching and Learning of Architecture Qualitative- Issues and Options', explores the existing status of architectural education in India on one hand and highlights the global issues faced in pedagogy to impart qualitative Architectural education. It is a valuable compilation of articles written time to time as an expression of experience by Faculty and Architects in Education. Also there is a mention of ' The new Education policy', which if translated well can definitely refine the current education scenario in Architecture as a profession.

The book brings out the fact that, imparting a high-quality Architectural education involves a sensitive and a balanced thinking with intense work and involvement in producing a methodology which justifies the versatility of knowledge and skills required to create intelligent and competitive Architects Globally.

Dr. Rashmi Ashtt
Sonipat

CONTENTS

ARTICLES	PAGE NO.
Why one should opt for Architecture as a career option	14
Good Global Practices and Architectural Pedagogy	18
Redefining Future of Architects and Architecture in the changed context of Architect's Registration under Indian Architects Act	24
Emerging challenges and issues in architectural education in India	32
Chartering new agenda for Architectural Education Post- Covid 19- Changing Role of Council of Architecture	42
Decoding the Council of Architecture (Minimum Standards of Architectural Education), Regulations, 2020	47
Leveraging Videos for Redefining Architecture and Planning in Urban India	60
Future of Architecture in India	67
Suggestions regarding improvement of the profession of Architecture	69
COUNCIL OF ARCHITECTURE (Statutory authority constituted under the Architects Act, 1972)	72
BIBLIOGRAPHY	76



Why one should opt for Architecture as a career option

- Architecture, as the mother of all arts, gives you an enough options to combine your artistic and science abilities while doing your professional work.
- Profession of architecture gives you enormous opportunities to showcase your skill, talent and creativity by designing all kind of buildings.
- By the very nature of buildings, which have life spanning over years and centuries, you can leave your footprints on this earth.
- As buildings have major implications in terms of consumption of energy and resources besides generating waste, by designing sustainable and green buildings, Architects can make this world a much better place to live and work.
- Since buildings make people healthy and sick, role of Architects becomes crucial in promoting healthy societies and communities.
- **Novelist Victor Hugo once wrote that ‘architecture has recorded the great ideas of the human race’ and, to an extent, he was right.**
- Architecture students can claim to be part of something great because this profession gives them the liberty of designing all kind of buildings etc with best of professional skill.
- No city can be liveable and smart unless Architects are actively involved in the making of cities.
- **Architecture helps you to be a Change maker--**Profession of Architecture is capable of making a difference and is known to impact communities and change the pattern of life of the people who live in them, by designing buildings which communities need to live and learn including schools, housing etc
- **Team work--** Studying and practising Architecture helps you to be in the company of number of professions and professionals including construction, materials, technologies, services, landscaping, industry etc which helps students/architects to develop skills in empathy, understanding, delegation, communication and leadership.

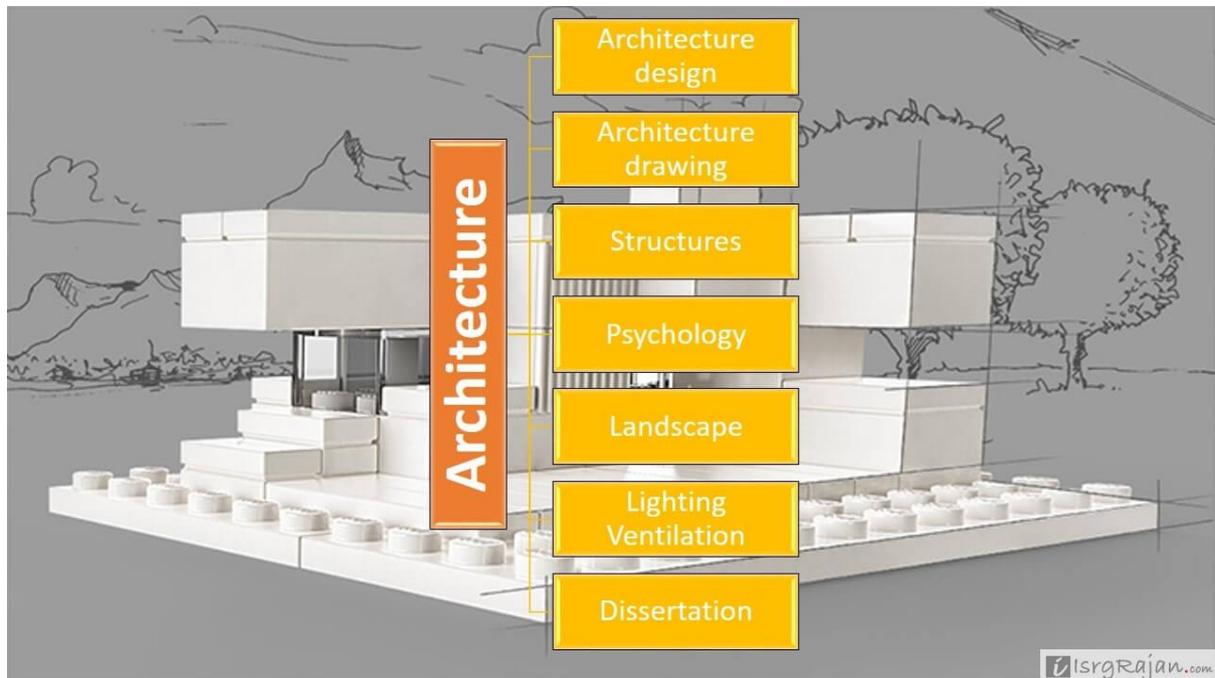
- **Diversity of work—**Architects have opportunity to work on all kind of projects which helps them to make an impact on society. Architects build modern homes to fit the needs of growing families and are among the select few that help craft a city’s skyline through the creation of buildings that make a mark and define the personality of city ie twin towers, world trade centre, empire state building, Taj Mahal etc

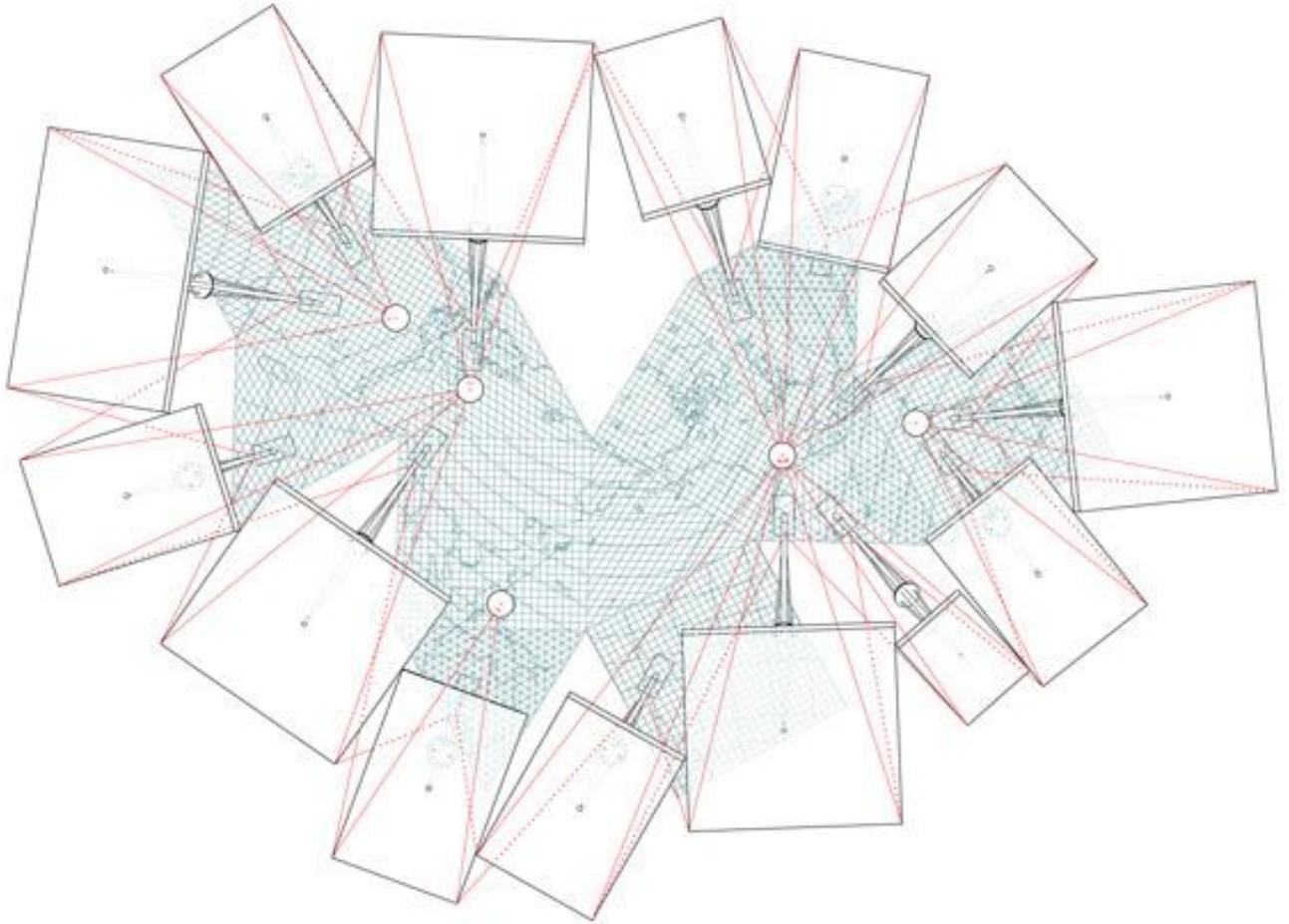
- **Travelling and exploring--**Students with flair of travelling and searching new things will find the profession of architecture much more fascinating because of the options it provide to be innovative in all professional activities. Architectural practice provide enough opportunities to travel. During travelling and looking at different places, one will have lot of opportunities to look at numerous elements, both natural and manmade at various places. Visiting various places and various buildings help him to understand the context of climate, materials, technology, prevailing culture, social setup, economic conditions of society which went into dictating and defining the art and architecture of a place and period. Accordingly, Site visits and tours of historical places and buildings of architectural importance have been made integral part of architectural teaching and learning.
- **Study and Research--**Profession of architecture also provide numerous opportunities to study and research. Since each project is different and has different context and requirements, accordingly, architect has to study in detail the requirements for the project and prepare a project brief before taking up the designing part. In addition, profession make architects meet numerous people and groups during the course of practice, including clients, users, service providers, professionals, material supplier, workmen, contractor, builders etc, which he has to deal with, which helps him to understand their perception, issues, ideas and demands,
- **Good option for Girls--**Girls would find the profession of Architecture as better option because this profession gives them the liberty to work from home and as per their convenience. They can also take care of home and family while practising, because profession gives them the flexibility of work as per their convenience and the availability of time. However, they have to have aptitude for the profession.

Generally observed, girls make better designer because of their capacity and capability to concentrate and focus. Therefore, girls can opt architecture as an option rather than engineering or other professions which are more demanding.

- **Employment**--Architecture as a preferred career option can be exercised by students because India, with growing population and growing urbanisation, is required to create on annual basis building footprints amounting to 700-900 million square meters. Accordingly, with urban population becoming 800 million by 2050, there will be large enough employment/business opportunities for Architects in both building sector and urban sector in years to come. With Government of India launching missions/schemes like Prime Minister Awas Yojna, Smart Cities, AMRUT, RU-Urban, NULM, HRIDAY involving investments running into billions, surely will create enough job opportunities for budding architects. Once the local bye-laws are amended, providing that only Architects are competent to design buildings, opportunities for Architects and the profession will grow many fold in the urban sector alone. With sustainability, quality and energy becoming focus, Architects will be in greater demand in the building sector. Changing typologies, context and large footprints of buildings are also calling for the services to architects to meet the emerging needs of institutions, business and industry.
- **Starting Practice**—This profession allows you to open up independent practice after you graduate. Lot of students, immediately after passing open their offices for architectural practice and take up design assignments. However, it will always be advisable to work under a good architect for 4-5 years, thoroughly learn the intricacies of the profession, approach to design, services, structure, construction of buildings, handling of clients, preparing contracts/agreements, preparing/floating tenders etc, before starting with the practice.
- **Opportunities in Rural Sector**--Rural sector, which houses 833 million Indians- more than 69% of country population, still remains untouched by the profession of architecture. With growing income, rural areas will also offer number of career options to architects.
- **Diversification**--In addition, degree in Architecture also provides would provide enough options for diversification into other areas of specialisation including housing, landscaping, interior design, transportation, urban design, urban planning, construction/ project management, environment and ecology, infrastructure planning, real estate etc which have their own domain in professional growth.
- However, despite these distinct advantages, architecture as a profession has its limitations also. One should opt for studies in architecture, only if student has an aptitude for learning, experimenting and creativity. One should go into profession not as a compulsion that he is to become an architect but only as a choice that student is to learn architecture.
- Student must have great liking for free hand sketching, drawing, painting with an artistic bent of mind towards creativity. Students having disliking for drawing should prefer to stay away from profession, otherwise it will prove to be disaster. Persons having proficiency and liking in physics, chemistry and maths with low aptitude for drawing and creativity should avoid the profession. Architecture as a course of study and profession involves lot of study, thinking and hard working, those who cannot afford this should avoid the profession. There will be numerous instances when your best work will be negated and one should remain prepared for the worst and should have the courage and capacity/capability withstand and continue to work with passion and vigour. Money wise also students of architecture will be below par as compared to other professionals and it may lead you to high degree of frustration. You have to be mentally prepared for this in initial years of career. However, hard work, sincerity, creativity and thinking out of box can help you in becoming financially sound. Profession involves training of human faculties, accordingly students will have to concentrate in creating skill sets to differentiate between good and bad and how to promote quality structures using best of options for planning and designing buildings. While opting for architecture as a career students should opt for institutions which impart quality education and not any sub-standard institution imparting degree in architecture. Good faculty, good environment and good supportive infrastructure can help in making learning architecture simple and effective.
- Architecture is known to be such a broad subject no one can claim it to learn it all. Becoming an Architect should only be pursued if you are truly passionate about the work not because you want to have a title of

an Architect. Architecture remains, globally and locally one of the most competitive professions. It starts the second you apply to design school and it never stops.





Good Global Practices and Architectural Pedagogy

Good Global Practices and Architectural Pedagogy

INTRODUCTION

Architecture, as a profession, is known for its numerous connotations, locally and globally, as a passion, avocation, a science, social art and a business. Primarily and essentially involved with creation of built environment, architecture is known to be both process and product besides provider of a sense of place and supporter of all types of human activities. Known for its genesis in the creation of built environment, Architecture aims at making man-made environment gel in harmony with the natural environment. As promoter of health and well-being, architecture has enormous capacity and capability of making value addition and enriching the human living and working, both aesthetically and spiritually. As promoter of construction industry, Architecture is known for creating enormous economic opportunities besides creating legacies symbolizing culture and traditions. Marcus Vitruvius, the great Roman architect and historian of the first Century BC and author of the treatise *De Architectura* refers to, “*firmitas, commoditas and delicta*”, as the basic traits of Architecture.

Despite numerous connotations Architecture, as mother of all arts and synthesis of all sciences, has its operational domain in creating state of art built environment, promoting sustainability and minimising use of resources and energy besides serving the basic human needs of living, working, care of body, mind, spirits and circulation. Architecture is, primarily and essentially, a design-based activity supported and guided by basic elements of sun, space, verdure, function, form and order. It is a unique blend of aesthetic, technology and humanities duly supported by technical input but not like pure civil engineering. Since it is an activity where end product is meant to meet the basic needs of providing appropriate shelter, accordingly its role and importance in creating appropriate, supportive and sustainable built environment assumes importance. Profession of Architecture, which is known to have been practised right from the day human beings came to exist on this planet, has got its recognition as a profession only recently.

Despite housing enormous built heritage created over centuries, formal architectural education in India had its origin much later, which came only a century ago with the opening of Sir J J College of Art and Architecture in Mumbai in the earlier part of 20th century. With architecture, both as a profession and practice, getting firmly rooted and commanding a relatively better acceptance in the post- independence and post- liberalisation period of technical education in India, large number of students started opting for architecture as a profession. This has led to number of such institutions mushrooming in the country. With opening of the large number of institutions, pattern and quality of architectural education has emerged an issue of intense debate and scrutiny among the professional Architects, professional institutes, academic institutions and the technical universities regulating the architectural education, so that education imparted remains relevant to the context and the issues/challenges faced by the society, community, cities and nations, both locally and globally, are adequately and appropriately addressed. Since sustainability of any profession is closely linked to the quality and dedication of professionals serving them, accordingly, it becomes critical that quality of education imparted must be of the highest order, relevant to the needs, ethos and objectives of the profession and society, so that professionals could meet the aspirations of community, state, nation and all stakeholders in a rational and realistic manner. However, over the years, with liberalization and opening of the economies leading to globalization, profession of architecture is facing numerous challenges and threats due to fast changing construction technologies, new found materials and rapidly changing architectural vocabulary and building footprints. New found pattern of professional practices and design strategies have also created numerous challenges to the profession and the professionals. To meet these challenges, effectively and efficiently, professionals need to be equipped with different skills, knowledge, experience, expertise, capacities and capabilities, largely driven by state of art technologies. Architecture, as a profession, is now being viewed as the extension of the new technologies, materials and innovations in design and structure. Accordingly, architectural institutions are in a state of flux to find and discover new order and pattern of architectural pedagogy to meet these fast emerging challenges and threats effectively and efficiently. Prevailing architectural education, which has its genesis in the old schools of western thoughts and ideas, need close study,

analysis, rationalization, review and redefinition to make it more relevant to Indian ethos, culture, environment, ecology, climate and needs of multi-layered society and communities in order to make it a distinct and unique. In order to achieve the defined professional objectives, large numbers of issues need to be addressed in the domain of architectural education. New found challenges in the profession require scope, intent and content of architecture to be enlarged by stepping out of buildings to include the design of the total built environment spanning from micro level of designing and construction details of buildings to the macro level of town planning, urban design, and landscape architecture.

GLOBAL PRACTICES

In this era of fast changing materials and construction technologies, institutions of excellence in architectural education, are trying to review, revise and redefine architectural pedagogy on regular basis for skilling students and enable them to meet the emerging challenges in the domain of the built environment. Accordingly architectural institutions are trying to focus on skilling and creating core competencies among students needed for understanding and ability to write, draw, and speak and to promote thinking, dedication, self-discipline for evolving state of the art architectural solutions through connecting with people, places and ecology besides understanding relationship between people and buildings; between buildings and communities; between communities and cities and between cities and ecology /sustainability. The system of architectural education in Russia is being redefined with a view to meet the emerging demands made by the development of modern

Architecture, both as a science and an art and by modern construction techniques..

The training of architects is being undertaken by specialties: civil construction, Industrial construction, urban construction (urban planning), landscaping, interiors and the inside equipment of buildings. The leading subject is architectural designing-- complex creative discipline that enables students of architecture to acquire professional experience by passing from the designing of simple buildings to

complicated ones. For making optimum use of new building materials and modern construction technologies of mechanization and prefabrication, the technical training of future architects has increased. The need for architect technicians

has grown enormously. In this fast changing scenario, contours of architectural education are changing rapidly. For making architectural pedagogy more relevant, education is envisioning promoting knowledge of research methodologies, consultancy projects, and about industry, organizations and procedures related to design and project planning and to create a sustainable and environmentally responsive architecture. Globally, institutions involved in imparting architectural education are trying to achieve these objectives, through:

i. State of Art Architectural Learning

- **By evolving Studio Culture** :--Making studio as the hub of architectural learning and experimental Learning, involving :
 - a. **Hands on application of concepts or ideas**
 - b. **Learning from experience** as opposed to theories
 - c. **Applied learning** outside classrooms
 - **Organising Workshops**- On crafting of functional objects- model making/ architectural designing/ construction skills/ graphics, etc.
 - **Promoting Learning with Commitment** - to society, environment, accessibility and sustainability.
 - **Creating Chairs** to promote innovations and for carrying out research projects.
 - Making students learn **advanced technologies**- through
 - How to make **scaled models**.
 - **Using laser cutting machines**
 - **Using Computer controlled machines (CNC)**
 - **Making volumetric model**
 - **Creating Core Competency** in students by re-orienting teaching and learning process to develop:

- **--Personal Competency-** critical thinking, creativity, ability to plan and organise, team work, leadership, self-discipline, dedication, analysis, synthesis, skills etc.
- **Special Competency in terms of--**
 - Ability to create **architectural designs with functions/ aesthetics**
 - Ability to **perceive and understand relation between people and buildings**, buildings and environment, and environment and society.
 - Knowledge of **research methods and consultancy projects**.
 - Knowledge of **physical problems and various technologies**.
 - Promoting **Learning through organising and participation in competitions**

Making students active partners in teaching –learning process by making students integral part of teaching

- **Dispelling the conception** that student of Architecture has to be trained to be a designer only – students must be allowed to charter his path during the education and choose what he would like to be- designer, construction manager, sustainable designer, landscape architect, architectural critic, journalist, photographer , structure expert etc depending on his interest ,capacity and capabilities. Institute must provide the option and environment for students to charter his path of growth and learning.
- **Training of Faculties-** Education focussing on training the five faculties of human beings- hearing, seeing, smelling, tasting , analysing – to understand, appreciate and differentiate between good architecture and bad architecture besides what goes into making of good and bad architecture.
- **Learning the context of green buildings-** in promoting sustainability and minimising global warming and carbon footprints of built environment

ii. Focussed Architectural Teaching

- **Teaching based on undertaking projects of all scales** – learning by doing
- **Adopting Global Approach in Teaching** - for developing global perspective
- **Promoting Education-** based on providing knowledge of both theoretical and practical tools - to ensure higher learning and better employment.
- **Making Education Broad based** - by working transversely at different levels i.e. subjects to be taught in a cross cutting/ transversal manner for better understanding / interaction with other professions.
- **Making Research and Development** --integral part of architectural teaching and learning
- **Involving Professional Architects of Eminence-** as part of faculty- both visiting and regular.
- **Hiring highly experienced and dedicated faculty** -for interacting with students
- Promoting high degree of **interface between Industry and Academia** -for making architectural education relevant to changing needs of profession, society, technology, etc
- **Focusing on process rather than on product** – in the Learning Processes/Methodology -to make architecture objective and focussed.
- **Making Education output rather than input based** - with teaching re-oriented with focus on student’s learning rather than on teacher’s output
- **Making Classroom a research lab-** where self -learning of student is promoted by experimenting, innovating, freedom of thought and action
- Promoting **research and experimentation** in the teaching – learning process
- Education focussing on **skilling student** -- to appropriately take care of professional responsibilities

- Making student **understand his role and responsibility to community, society**, state and environment besides promoting sustainability
- Making **student understand and appreciate the entire gamut of buildings anatomy**, its impact on human living and options for making optimum use of nature and its renewable resources to create healthy and productive buildings
- **Recognising and awarding merit among Faculty** - to promote quality, innovations in architectural learning and teaching

iii. Empowering Students through;

- **Developing Global Perspective**
- **Creating Forums** – organising series of conferences involving national and international architects
- **Providing personalised Attention to students**- through advice and coaching- assigning an Academic advisor and a professional coach
- **Creating a National/ International Job Bank** - for facilitating students for jobs locally and globally.
- **Providing State of Art Infrastructure** – soft and hard for promoting excellence in learning.
- **Organising Study Tours/ Visits** to historical places of architectural importance and important modern complexes / buildings on regular basis.
- **Promoting Interface with Institutions of Architectural Excellence**- Locally, nationally and globally
- **Promoting exchange of Students and Faculty**-- with International Institutions of Excellence
- **Focussed selection of quality faculty**- having aptitude, commitment, competency, understanding and capacity to deliver and engage students in learning
- **Providing options in learning based on students capacity**- liking, understanding etc to make optimum use of his skills
- **Recognising and awarding merit among Students** to promote quality, innovations in architectural learning.

WAY FORWARD

Viewed both as art and science, profession of Architecture provides enormous options for creating and shaping built environment and living space based on functionality and aesthetics. With ever evolving and devolving materials and technologies, the boundaries and contours of architecture/buildings are constantly shaping and expanding. Looking at the given context, architects are required to gel aesthetics, economy, resources and environment with functionality to create appropriate, sustainable, state of art and functional buildings without sacrificing the basic objectives and user's convenience. This calls for making architectural pedagogy relevant to the professional obligations which architects are required to discharge after graduating from institution. Accordingly, intent, scope, framework and contents besides manner of Architectural pedagogy remains critical for preparing students to meet the emerging challenges posed by the ever changing context of built environment. This would require shift of approach of architectural pedagogy based on knowledge, driven solely not from books, but also from workshops, building sites and professional offices. This would help in changing the paradigm of imparting education from class room teaching (involving techniques of research, planning and communication) to extending it to construction sites learning, for acquainting students to acquire the knowledge and understanding of the construction techniques followed to make architectural vision an absolute reality.

Architectural pedagogy remains most challenging in the Indian context. Challenge before Architectural pedagogy is how to motivate and involve students of architecture to observe things objectively, understand their role and importance and create solutions which promote the welfare of the society and community they belong to. Architectural pedagogy, basically and primarily, is aimed at enhance learning experience in design based on learner-centred teaching paradigm (Weimer 2002), which calls for in depth study of cognitive patterns and learning processes in order to identify what goes in learners minds. Since concepts and ideas formulated by the architects impact conditions of human living, thinking and working, accordingly profession of architecture must play an important role in modulating social environment and become an active partner in bringing crucial changes impacting human living. Creating rational architecture involves achieving a balance between aesthetics, sensibility, functionality, materials, technologies, environment and understanding of what goes into making of quality built environment.

Considering the entire gamut and complexity of profession of architecture, architectural pedagogy should be made inter-disciplinary based on the principles of promoting understanding in a heterogeneous ways of the art and science of built environment; enhancing students learning and engagement with the knowledge imparted,(Gardner 1983); integrating/ promoting connectivity between technical and non-technical subjects ; role and importance of technical subjects and design oriented subjects and their inter-relationships; making architectural teaching process based rather than product oriented; adopting integrated/holistic approach to teaching and learning ; facilitating co-operative/collaborative working of teachers and students to create more effective, efficient , productive and meaningful teaching-learning system; creating an integrative curriculum for helping students to gain comprehensive understandings within and across various disciplines; making Architectural pedagogy interdisciplinary; integration of architecture disciplines with other disciplines etc. In order to make architectural pedagogy more relevant, meaningful, focussed, effective and efficient, role of technology, ICT, Internet of things , 3d printing, virtual reality, drone technology etc needs to be made integral part of Architectural teaching and learning. However promoting research and developing and evolving research based detailed teaching methodologies for different subjects will go a long way in making architectural pedagogy more relevant and contextual.



Redefining Future of Architects and Architecture in the changed context of Architect's Registration under Indian Architects Act

Redefining Future of Architects and Architecture in the changed context of Architect's Registration under Indian Architects Act

Introduction

Juxta-positioning four major fields of human endeavour involving; Humanities for thinking, Science for exploring, Art for expressing, and Technology for inventing; as integral part of architectural professional education and practice, has led to the acceptance of architecture as one of the most iconic, unique and multi-disciplinary profession. Amalgamation of four distinct fields of humanities, art, science and technology has also led to creation of spaces, environment, structure and monuments, which continue to define the growth trajectory of homo-sapiens since their inception on planet earth. Also called the matrix of human civilization – Architecture is known both as definer, authentic measure of the social status and an evocative expression of the ethos of an era to which they belong. It is widely believed that when conserved, buildings are known to create heritage but when in ruins, they become archaeology. Buildings are known also for their value, role and importance to reconstruct the past glory of human civilizations.

In this era of globalization, liberalisation and opening of the economies, nature and context of built environment is changing rapidly. Buildings are becoming more complex in their product mix, usage, planning, designing, structure and services. Buildings are expanding both horizontally and vertically. Footprints/volume of buildings are fast expanding with buildings gaining rapidly in height. Innovative new building materials and emerging state of art construction technologies are changing the basic approach to planning, designing and construction of buildings. Use of computers and innovative programming/soft skills are helping Architects to explore new typologies of spaces by experimenting with new forms, fabric and functions, changing the architectural context and building vocabulary.

Led by increasing expectation and changing building typologies, profession and practice of Architecture is passing through an era of great experimentation, innovations, challenges and competition. Accordingly, demand on the profession over the years has become much more complex in nature and wider in scope. Originality, creativity, conceptualization, perception, aesthetics, sustainability, energy/water efficiency, productivity, high indoor air quality, quality of life and a holistic judgment of people, places, objects and events have emerged as the basic elements of designing built environment. Being primarily and essentially, the art and science of designing spaces for serving the multifarious activities of human beings and for meeting their specific needs in an effective and efficient manner, Architecture has critical role in making people and communities healthy and productive besides making them environmentally, socially and physically sustainable.

Criticality of the profession of architecture, to make this world more productive, liveable and sustainable, has been universally accepted. Seventeen Global Sustainable Development Goals mandated by the United Nations have also accepted the critical role of built environment in making this world sustainable. Buildings are known for their role as major consumers of energy & resources besides generators of waste, making them largely responsible for global warming, climate change and creating large carbon footprints. With human beings spending 80% of their life span within buildings, making people healthy, productive and happy also largely depends upon how the buildings are planned, designed and constructed and quality of indoor living offered to the end users. Accordingly, Architect's role assumes critical importance and profession of architecture is being valued globally in promoting global stability.

Considering role and importance of Architecture in promoting sustainability, conservation of non-renewable resources, preserving ecology, protecting architectural heritage, promoting affordable shelter, making human habitat more liveable, it becomes critical that Architects are appropriately trained and provided with appropriate vision, skill, knowledge and expertise to render quality services to create state of art buildings before they are allowed to practice as a professional architects. This calls for laying down a well-defined framework for checking the competency of a professional before authorising him/her to render quality services as a professional Architect. Understanding and valuing the importance of quality architectural services to be rendered, nations across the globe have used the mechanism of registration of Architects as a corner-stone before permitting them to operate as professional Architects. Accordingly, registration process of Architects has gained enormous importance in the professional domain of architectural practice. Considering the critical role and importance, process of architect's

registration needs to be made more rational, objectives, transparent, effective and efficient in order to ensure the quality of profession and professional services.

Practice of Architecture--Indian Scenario

The practice of the architectural profession is regulated by the Architects Act, 1972, and the regulations framed there-under. The Council of Architecture has prescribed the Conditions of Engagement and Scale of Charges under the Architects (Professional Conduct) Regulations, 1989. The documents stipulate the parameters within which the Architect is required to function. They define the responsibilities, the scope of work and services and prescribe the mandatory minimum scale of professional charges with a view to make client fully aware of the duties and services which he may expect from the Architect. The professional services required by the client may not be comprehensive in scope in all cases and accordingly a clear understanding between the two must be arrived at. The Council of Architecture has prescribed the conditions of engagement based on general practice of the profession in India. These documents are applicable to all the registered architects.

Comprehensive architectural services

Since architects are known to be providers of wide and varied range of services, accordingly Council of Architecture has detailed out the professional services along with schedule of services required to be provided by Architects in respect of the following:

ARCHITECTURE:

- Taking client's instructions and preparation of design brief.
- Site evaluation, analysis and impact of existing / proposed development on its immediate environs.
- Design and site development.
- Structural design, sanitary, plumbing, drainage, water supply and sewerage design.
- Electrical, electronic, communication systems and design.
- Heating, ventilation and air conditioning design (HVAC) and other mechanical systems.
- Elevators, escalators, etc.
- Fire detection, Fire protection and Security systems etc.
- Periodic inspection and evaluation of Construction works.

ALLIED SERVICES:

- Landscape Architecture,
- Interior Architecture,
- Architectural Conservation,
- Retrofitting of Buildings,
- Graphic Design and Signage.

SCHEDULE OF SERVICES:

The Architect shall, after taking instructions from the Client, render the following services:

- **Concept Design**
- **Preliminary Design and Drawings**
- **Drawing for clients/ statutory approvals**
- **Working drawings and tender documents**
- **Appointment of contractor**
- **Construction of project**
- **Completion of project**

Registration of Architects

Registration of Architects, as an issue, as an option and as a strategy, to secure the authenticity, recognition, exclusiveness and assurance to the end users, of the quality of professional architectural services rendered, is gaining currency both locally and globally. Objective of the registration of architects is to ensure that the person registered, possesses necessary qualification, expertise and experience for rendering professional services related to planning, designing, supervision and completion of the building /project, as an architect, for the work/service he has been hired. Considering the fact that Architects are required to provide wide range of services to the client, therefore possessing required qualification and experience would be critical to provide quality services to the client for the project. Registration, as a matter of fact, is valued globally for the reason that it assures client that registration has been granted by the appropriate authority after following defined process and checking the credential, that person registered has required level of skill, experience and expertise to undertake the job and deliver the right kind of service/product for which he has been registered. Accordingly, all nations in the world have made it mandatory for Architects to obtain registration before they are allowed to practice and render professional services to the public at large. In addition, registration also makes it obligatory on the part of Architects to follow the specified Professional Code of Conduct, governing their services ensuring protection to the client in its professional dealing.

Professional requirements for Registration

Prior to the late 19th century, professionals engaged in design /supervision of construction projects were not necessarily trained in architecture program in academic setting. Instead, they usually carried the title of Master Builder, or Surveyor after serving for a number of years as an apprentice under people of eminence. However, formal study of architecture in academic institutions has changed the entire context and has also played a pivotal role in the development of the profession as a whole for serving as a focal point for advancement in architectural technology and theory, which has led to the emergence of present system of registration. Professional requirements for registration of architects in the modern era vary from place to place and nations to nations. It generally consists of three key elements involving; a university degree or advance education; a period of internship or training in an office, and examination for registration. In order to have a feel of the global practices, study has been carried out of the process and procedures followed in the few select countries regarding registration of architects, which is detailed below;

Australia

Australian law mandates, three basic and essential requirements to be fulfilled, before granting registration as an architect;

- having obtained a professional degree from an accredited school of architecture;
- with at least two years of practical experience; and
- having qualified architectural practice examination

In Australia, prevailing legal framework makes it an offence for anyone, other than a registered architect, to use the title of Architect. The title of architect is legally limited to those professionals, which are registered as Architects, as mandated by the law of that state. There is no uniform legal framework for the entire country. Accordingly, for registration, professionals are required to comply with the provisions of the concerned state legal framework, where they want to practice. States/ territories have separate legislation to govern the use of the title *architect* and for creating Architects Registration Boards responsible for granting registration to the architects. These boards are affiliated through the Architects Accreditation Council of Australia (AACA). The task assigned to the Council is to conduct assessments for architects with overseas qualifications for the purposes of migration and/or registration as an architect in Australia. Schools of Architecture are accredited by state and territory boards, based on a procedure jointly agreed by the AACA and the Australian Institute of Architects.

Canada

Canadian system of registration of Architects revolves around three basic requirements involving **education, experience and examination**. Pattern defined is similar to the one followed in Australia with the exception that in case of Canada, initial education prescribed is of higher order as compared to Australia, as detailed below. After completion of the educational requirements, IAP, and examination, candidate can apply for registration/license with their respective provincial architectural institute. For maintaining their license to practice, Architects must pay an annual fee and meet prescribed continuing education requirements.

- **Education**—Architect must hold a master's degree in Architecture, duly certified by the Canadian Architectural Certification Board (CACB). Candidates holding under-graduate degree in architecture

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

have to undergo, Intern Architect Program (IAP) to gain a minimum of 5,600 hours of work experience, as mandated under their respective provincial Architects Act, to ensure that the Intern is provided with sufficient experience to meet the standards of practical skill and level of competence required to engage in the practice of architecture

- **Experience**—In addition to the basic qualification, candidate has to obtain requisite experience under the direct supervision of a registered architect. Experience required for registration has been broadly divided into four main and 16 sub-categories.
- **Examination**- All candidates have to clear a series of seven computerized exams, known as--Architect Registration Examination (ARE), before enrolment as an Architect. Architect Registration Examinations are conducted by the National Council of Architectural Registration Boards (NCARB).

France

In France the profession is defined and regulated by the 1977 Law. Law protects both, the title and practice of Architecture, in France, law also defines the educational and other requirements to practice as an architect. To practice as a project manager (maître d'oeuvre in French), an architect must meet the following requirements :

- hold a M.Arch or Master's degree in Architecture
- hold the "Capacitation for project management in its own name
- hold certificate (HMONP, Habilitation à la Maîtrise d'Oeuvre en Nom Propre, in French)
- Registered with the National Architects Order Board- the French institution that protects the *architect* title and profession.
- have a Professional Liability Insurance coverage

Germany

In Germany, the title of architect is legally protected. For using the title, it is mandatory for the professional to get registered with the Provincial Chamber of Architects. Admission to a German chamber of architects is required for someone to be a professional architect besides having prescribed experience under a registered Architect. The chambers also provide registration to interior designers, landscape architects, and urban planners. For registration as an Architect, following are the basic requirements:

- successful completion of a four-year architectural program
- undergoing continuing professional education, and
- several years of practical experience under a registered architect.

Duration of experience for registration varies from chamber to chamber and is based on either place of residence/ place of residence of the architect. All provincial Chambers of Architects are members of the Federal Chamber of Architects located in Berlin. However, federal chamber does not provide professional registration.

Ireland

The title of 'Architect' in Ireland has only recently been protected under the Building Control Act 2007, which can be used only after registration. To become a registered Architect, the essential requirements are;

- Completion of five years' full-time study in the recognised schools of Architecture,
- minimum of two years approved experience, and
- having one of the recognised Professional Practice qualification

In addition, since the year 2009, registration is also available through the ARAE (Architects Register Admission Examination), which provides opportunity to those without the required educational and professional qualifications.

Italy

For entering into profession and practice as an Architect in Italy, Architect is required to get registration with the *Ordine degli architetti* (Order of Architects). The Orders are organised by the province and registration is based on place of residence of the architect. For registration, the requirements are;

- Possession of a degree in Architecture, or a degree in Building Engineering/ Architecture,
- Obtaining a professional qualification- by passing a state exam with four tests (three written and one oral).

Singapore

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

Singapore legal framework protects the title of Architect and mandates two essential requirements for registration as an Architect, which includes possessing requisite qualification and a post-qualification experience as detailed below;

- Recognised under-graduate five years degree in Architecture from Singapore or other recognised university
- Work experience of minimum of two years under a registered architect .

Sri Lanka

Prevailing legal framework in Sri Lanka protects twin titles of "Architect" and "Chartered Architect" under the Architects Registration Act,1979 and the Sri Lanka Institute of Architects (Amendment) Act, 1996. However, for registration as an Architect in Sri Lanka, it is mandatory for Architects to fulfil three basic requirements which include;

- **Education**—A recognised degree in Architecture from one of the two available institutions in Sri Lanka or by any foreign university recognized by Sri Lanka Institute of Architects.
- **Experience**—Minimum 2 years of appropriate work experience after graduation under a registered Architect
- **Examination**—Successful completion of SLIA Part III examination would lead to the charter and the Architectural Registration Board (ARB) registration.

United Kingdom

United Kingdom also legally restricts practicing under name/style/title "architect- unless registered with the Architects Registration Board. Usually, it takes minimum of seven years to obtain the necessary qualifications and experience for registration in UK. Royal Institute of British Architects has critical role in the registration process. The process of registration of Architects includes educational qualification, working in an Architect's office and passing an exam, as detailed below;

Candidate must first study at a recognised university of architecture. Before qualifying for registration as an architect, a candidate must pass through three stages administered by the Royal Institute of British Architects.

- Completion of an initial degree in architecture (usually three or four years, usually either a BA, BSc, or BArch- candidate receives exemption from RIBA Part I)- followed by a minimum of one year working in an architect's office to gain work experience.
- Then on completion of a post-graduate university course, usually two years, candidate receives exemption from Part II of the RIBA process.
- Candidate after spending a further period of at least one year working in an architect office is permitted to take the RIBA Part III examination in Professional Practice and Management.
- On successful completion of exam, he is granted registration as an Architect.

United States of America

In the United States licensing of architects is state specific. There are national standards, but every state issues its own licenses and sets its own requirements. The process always continues to evolve. Many states (and the AIA) have continuing education requirements, which means architects have to document educational hours in topics relevant to the profession to renew their license. Each state has a registration board to oversee state's licensure law. In addition, National Council of Architectural Registration Board (NCARB) was created in 1919 for promoting parity among states' rules and to issue the national certificate to qualified licensed architects. The NCARB certificate is recognized in most licensing jurisdictions for the purpose of granting licensure by endorsement or reciprocity. Entire licensure process takes at least 7 to 11 years to complete including five years of study. Registration as Architects in various states is based on three common requirements which involves 3Es- Education, Experience and Examination as detailed below;;

- **Education**- Possess professional degree of B. Arch /M. Arch -- from a school accredited by the National Architectural Accrediting Board (NAAB)
- **Experience** – Undergo experience under *Intern Development Program (IDP)*, defined by American Institute of Architects (AIA). It spans over 5600 hours, working under the direct supervision of a licensed Architect, to create base skills and core-competencies among trainee. The intern architect needs to earn 700 training units (TUs) diversified into 16 categories; each TU is equivalent to 8 hours of experience.

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

States waiving off the degree requirement typically require a full 10 years' experience in combination with the I.D.P

- **Examination** -. Pass *Architect Registration Examination (ARE)*-a series of seven (formerly nine) computerized exams administered by NCARB.

India

In the Indian context, the title of Architect has legal protection under the Indian Architects Act, 1972 enacted by the Indian Parliament. For using the title of Architect, one has to register with Council of Architecture, constituted by the Government of India under the provisions of the Architects Act, 1972. However, the practice of Architecture is not protected under the said law. No state and Union territory has any law related to architecture. For doing professional practice, it is not essential for getting registration under the Indian Architects Act, 1972. Designing, construction and supervision of buildings is regulated by the Building Rules/ Building Regulations/Building Bye-laws/Zoning Regulations, which are framed by the various Development Authorities/Urban Local Bodies/State Governments..

Unlike other countries, registration of Architects in India is solely linked with the professional qualification, payment of prescribed fee and place of residence in India. For avoiding hardship , registration under the Act was also initially granted to professionals holding qualification other than architecture, who were engaged in work related to designing of buildings for a period of 5 years prior to coming into operation of Act. Section 25 of the Indian Architect Act related to registration of Architects, provides as under;

“A person shall be entitled on payment of such fees as may be prescribed by rules to have his name entered in the register, if he resides/carries on the profession of architect in India; holds a recognised qualification, or if does not hold such a qualification but, being a citizen of India, has been engaged in practice as an architect for a period of not less than five years prior to the date appointed /Possesses such other qualifications as may be prescribed by rules

A perusal of the above provision clearly indicates that Registration of Architects in India does not follow the global pattern of registration, which is more stringent and qualitative. Globally, registration is considered as an exception rather than a rule. Globally, every student obtaining a pre-defined qualification in architecture is not granted registration unless he acquires requisite experience and qualify an exam to prove his competency that he has acquired necessary skill and competency to provide required level of quality services to the client who has hired him. Indian procedure for registration does neither involve any training or examination after graduation. The issue needs to be reviewed keeping in view the larger interest of the profession and considering the implications of large footprints of built environment yet to be created.

Conclusion

Considering the mandate given under the Global Sustainable Development Goals and the fact that India, as a nation, is passing through an era of massive urbanisation and large building stock is being added to the cities, it becomes important that architects must render quality services to make the nation sustainable, safe and productive. Studies have revealed that professional competency of students recently graduating from architectural institutions is not of appropriate order. Majority of graduates have been found to be ill-equipped to discharge professional responsibilities when they enter the full-time architectural workforce. Even very bright new graduates were found to be having low levels of knowledge of structures and materials. In the current volatile economic climate conditions, majority of practising architects simply feel they cannot afford to hire new graduates productively. Root cause of this malady may have genesis in majority of institutions moving away from delivering the core knowledge that enables students to enter into the profession.. With more than 465 institutions involved in imparting architectural education and number of students graduating running into thousands, it is time that system of education and registration of Architects under Architect Act is critically reviewed, revised and redefined to bring in line with the global practices. The issue assumes importance for the reason, majority of educational institutions are suffering from the perpetual problems of quality and experienced faculty. In this process quality of education has undergone considerable dilution and graduated coming out of institutions are ill-equipped to understand/undertake/discharge the complexities of the profession and the professional practices. Syllabus, course curricula and teaching- learning methodologies used in architectural institutions have been found to both outdated

and obsolete, creating wide gap between academics and the profession. In addition to promoting free creative expression during studies among students, an increasing majority of professionals believes that it must be balanced with a rigorous exposure to architectural management, practice, law and technical understanding. A single 'practice' unit of one semester in a five-year course is hardly sufficient to prepare students for the complex business environment in which architects currently are made to operate. The truth is that we are creating graduates who cannot function in the current marketplace, which will ultimately damage the profession's ability to operate effectively and competitively. Accordingly, it should not come as surprise to suggest that many professional architects have been calling for the radical reform in the architect's education and registration process.

In order to put the profession on high pedestal, twin strategy needs to be adopted involving renewing approach to imparting architectural education and rationalising process of registration under the existing Act. For overhauling the education system, Council of Architecture, Indian Institute of Architects and architectural schools of excellence must relook at the local and global good practices of imparting quality education and comprehensively overhaul the education system to bring it in line with the emerging professional needs and changing building typologies to strengthen graduate competency and the general profession. The review of education system needs to be based on; revising the framework for architecture education to promote quality professionals; revitalising the relationships between practice and academia; maintaining and enhancing courses in architecture without the loss of the creative intellectual, practical and professional content informing progressive practice.

Review of the system of registration of Architects under the Act should be based on the principles of making the process of registration more broad based, stringent and qualitative by not permitting registration merely based on obtaining academic qualification after completing the course of study; including element of minimum two full years of compulsory practical training under a registered architect; conducting a proficiency exam after completion of the training to check architects capacity and capability to meet the professional challenges and render quality services. In addition, Council should mandate that registered architect should also undergo periodic refresher training/courses or undertake research and development to upgrade their knowledge and skill on continued basis before renewing their registration.

In order to overcome the problem and frustration emerging from delayed registration, mechanism used by Queensland Building and Construction Commission to licenses its building designers in a three-tiered system as 'low-rise', 'medium-rise' and 'open' classes may be considered as an option. It involves, registration as a 'low-rise' architect on completion of a five-year architecture course, then later registering as a 'medium-rise' or 'open' class architect aligning with progressive experience. This would provide graduates with much needed morale and recognition after their extensive studies and progression through the profession. Registration process should not remain static and one time definition in the Act, but should be made more dynamic. It should continue to be ever evolving and ever devolving by reviewing/renewing it on a continued basis, based on the emerging professional and community needs. Government should review the 1972 Act, on priority, to make provision of constitution of a ***dedicated Board of accreditation and registration, comprising of eminent professionals in the field of architecture***, which should aid, advise and assist the Council on all matters related to architectural education and registration of architects / other related fields, in order to make the process more meaningful, productive, effective and efficient. Considering the prevailing conditions of education and profession in the country, future of the profession of Architecture will largely depend upon how quickly, effectively and objectively, we will review our system of architectural education and registration of Architects to make it more dynamic and responsive to emerging professional challenges.



**EMERGING CHALLENGES AND
ISSUES IN ARCHITECTURAL EDUCATION IN
INDIA**

EMERGING CHALLENGES AND ISSUES IN ARCHITECTURAL EDUCATION IN INDIA

Abstract; Architecture, as a profession, has its genesis in all arts and all sciences. Operational domain of profession of architecture revolves around creating buildings which are supposed to be synthesis of aesthetic, technology and humanities. Buildings are designed to provide optimum level of operational efficiency besides ensuring quality indoor environment for end users. Buildings are also known to be large consumers of energy and resources besides generators of waste. When not planned and designed rationally, buildings not only make end users unhealthy and sick but also create imbalance in environment and ecology. Considering large energy implications, carbon footprints, adverse impact on use of resources and promoting sustainability, buildings have to be planned, designed and constructed with great care, caution and sensitivity. Accordingly, role of Architects and profession of architecture assumes importance to create sustainable built environment. Considering massive growth of population and requirements of creating large number of state of art buildings, to take care of the basic human needs, profession of architecture is getting firmly rooted and commanding a relatively better acceptance in the post- independence period. With liberalisation of technical education in India and large number of students opting for architecture as a career, number of institutions imparting architectural education have increased manifold. With rapid growth of institutions, architectural education is facing large number of challenges and issues in terms of quality of education imparted; availability of quality faculty; mushrooming of architectural institutions; widening gap between education and profession; challenges posed by globalisation and liberalisation; changing architectural vocabulary; norms and standards of architectural education and new building materials & construction technologies besides role of the regulatory authorities. Based on the issues identified, paper attempts to define strategies and identify best global practices which would help in making architectural education more focussed, more qualitative, more supportive, more productive and relevant to the context. It would help and promote profession, by providing quality professionals to create new order of built environment, which is cost-effective, time efficient and makes users more productive and healthy besides creating buildings which are least consumers of energy and promoters of global and local sustainability

INTRODUCTION

Architecture, as an activity, has been in practice since man started creating shelter for himself for seeking protection from vagaries of the weather and safety from wild animals. The nature of shelter went on changing with the advent of technology, development of new materials, changing economic and social environment, growing trade & commerce and prevailing physical and political structure. Religion and culture made its contribution to enlarge the vocabulary of buildings. However, despite the fact architecture, which was practised for number of centuries in India, got recognition as a profession only recently.

Architecture is known to be synthesis of all arts and sciences with operational domain revolving around creating state of art built environment to serve the basic human needs of living, working and care of mind and spirits besides circulation. Architecture remains, primarily and essentially, a design activity supported and guided by climate, location, site, context, environment, ecology, materials, technology etc. It is a unique blend of aesthetic, technology and humanities duly supported by technical input but unlike pure civil engineering. Since it is an activity where end product is meant to meet the basic needs of providing appropriate shelter, accordingly its role and importance in creating appropriate, supportive and sustainable built environment assumes importance.

Opening of Sir JJ College of Art and Architecture in Mumbai in the earlier part of 20th century, marked the beginning of formal system of Architectural education in India. With architecture, as a profession, getting firmly rooted and commanding a relatively better acceptance in the post- independence and post- liberalisation period of technical education in India, large number of students are now opting for study of architecture. This has led to the surge /mushrooming in the number of institutions imparting architectural education in the country. With opening of the large number of institutions and growth in number of students during last decade, quality of architectural education, its relevance and context to emerging national realities has emerged as an issue of intense debate and scrutiny. Credibility of all professions has high degree of co-relation to the quality and dedication of professionals serving them. Accordingly, for promoting profession and achieving objectives ordained for the profession, it becomes critical that quality of education imparted must be of the highest order, relevant to the needs, ethos, objectives, environment and ecology, so that professionals could meet the aspirations of society and all stakeholders. However, under the growing impact of liberalisation, globalisation and multi-national culture, profession of architecture is facing numerous challenges and threats due to fast changing construction technologies, new found materials and rapidly changing architectural vocabulary and building footprints. New

found pattern of professional practices leveraged by commercialisation, building bye-laws, development controls, master plans, development plans, use of ICT and design strategies have also created numerous challenges to the profession and the professionals. To meet these challenges, effectively and efficiently, professionals need to be equipped with different skill sets, capacities and capabilities, largely driven by state of art technologies.

Architecture, as a profession, is now being viewed as the extension of the new construction technologies, building materials and innovations in design and structure. Accordingly, architectural institutions are in a state of flux to find and discover new order and pattern of architectural education to meet these challenges and threats effectively and efficiently. Prevailing architectural education, which has its genesis in the old schools of western thoughts and ideas, need rationalization, review and redefinition to make it more relevant to Indian context, ethos, culture, environment, ecology, climate and needs of multi-layered society and communities in order to make it a distinct and unique. In order to achieve the defined professional objectives, large numbers of issues need to be addressed in the domain of architectural education. Considering the fact that architectural education holds the key to transforming India's economy, energy security of nation, consumption of non-renewable resources, meeting the targets of global warming and local/global sustainability defined in the Paris agreement, we have to find solutions to rationalise the architectural education and make it both relevant, contextual and qualitative.

Major Challenges facing Architectural Education in India:

Looking at the existing scenario, key challenges facing architectural education can be enumerated as under:

- **Challenge of language:** Considering the fact that medium of imparting architectural education remains English only, for large number of students coming from the remote and rural areas where medium of education remains other than English, understanding basics and nitty, gritty of profession education becomes a nightmare
- **Challenge of faculty shortage: With rapid expansion of architectural institutions, stringent norms and large student's intake, there remains perpetual shortage of appropriate faculty.**
- **Challenge of low exposure to ground reality:** Majority of education being class room based, students have minimal exposure to the ground realities and challenges facing the profession, creating numerous problems when they graduate and search for position in the market.
- **Challenge posed by minimal Industry- academics Interaction:** With majority of teachers, being fresh graduates, without any professional experience, there always remains a disconnect between profession and academics, leading to mismatch between focus of education and the requirement of the profession.
- **Challenge in employability:** With poor quality of education, majority of students graduating from architectural institutions face challenge of gainful and respectful employability.
- **Challenge posed by numbers:** Large sanctioned intake of students coupled with acute shortage of faculty and limited availability of positions for practical training, makes it impossible to carry out qualitative improvement in education.
- **Challenge pose by engineering dominance: With majority of architectural institutions forming part of engineering institutions, limited opportunities and options are available for chartering independent path of architectural education**
- **Challenges posed by duration of the course:** With under-graduate course in architecture being of five years duration, as against four years for engineering, in majority of cases only left-over's from engineering courses join the architectural course in majority of cases.
- **Challenges posed by regulatory authorities:** Stringent and outdated norms and regulations, unsupportive attitude, lack of objectivity, politicising education/profession, irrational mechanism of inspection, focus on infrastructure rather than quality of education, irrational decision making, existence of large number of malpractices, irrational structure of regulatory authorities, conflict with governmental agencies have led to deterioration of architectural education
- **Challenges posed by teaching methodology ;** With focus on teacher and not on student ,the present system of education/ teaching remains input based and not on output based ; on product and not on process; on teaching and not on learning resulting in exclusion of students from learning process

Designing Built Environment

With principles of Scale, Proportions, Contrast, Order Beauty, Rhythm, Harmony and Order guiding the architecture, Operational domain and focus of profession of Architecture revolves around designing buildings to ensure that buildings so designed meet all the standards of visual and structural proportions; provide highest level of comfort; perform functions in the most effective and efficient manner; create durable structures with appropriate strength to meet any manmade and natural disasters besides being relevant to the given context.

Accordingly, Architectural Design commands highest priority, critical role and importance in the profession of Architecture, mandating all Architects that buildings are required to be designed with utmost care and highest professional input in order to ensure built environment makes value addition to the environment and ecology of any place, space and community where they are placed.

Critical role and importance of Architectural Design in the urban context, has been demonstrated by the Commission For Architecture and Built Environment, UK, by conducting a study titled, '**Value of Good Design-How buildings and spaces create economic and social value**', in the summer of 2002. Finding of the studies were:

- Better quality buildings and public spaces improve the quality of people live and quality of the built environment made a difference to the way they felt.
- Well designed buildings and spaces has positive influences on the quality of daily life, professional productivity, educational attainment, physical well-being
- Well designed hospital help patients get better more quickly
- Well designed school improve the educational achievement of its pupils
- Well designed department store have a direct impact on stock
- Well designed neighbourhood benefit from lower crime and higher house values

Report also stated that we cannot afford not to invest in good design. Good design is not just about the aesthetic improvement of our environment, it is as much about improved quality of life, equality of opportunity and economic growth. For a successful and sustainable society, we have to overcome our ignorance about the importance of design and depart from our culturally-ingrained notion that a poor quality environment is the norm. The stakes are high but to succeed we need to abide by three key principles:

- Good design does not cost more when measured across the lifetime of the building or place
- Good design flows from the employment of skilled and multidisciplinary team
- The starting point of good design is client commitment

Above study clearly demonstrates the role and importance of Architectural Design in promoting sustainability, safety, economy and lowering crime in the society besides creating buildings with low carbon footprint, low energy and resource requirements. Considering all these basic tenets, issues and challenges, architectural education has to be geared and redefined to create appropriate level of skills and competencies among the students of Architecture to evolve state of art building design and built environment.

Looking at the present context, focus on design solution unfortunately has been found to be lacking and diluted in the existing frame-work of architectural education and teaching methodology adopted. Students are asked to focus on product and not on process. This leads to copying of ideas and premeditated designs/ forms adopted by students, ignoring the critical elements of context, site, climate, topography etc, which form the basics of evolving architectural solutions. With architectural design taught once a week, students tend to lose focus on the subject, Majority of teachers, which are fresh and have no experience of industry, have no clue how to make student understand the genesis and process of designing buildings. In the process, understanding the Architectural design emerges as the major causality. The course curricula and teaching- learning process needs to be made more rational so as to improve the skill sets of students in the subject of architectural design.

COURSE CURRICULA

Considering the unique character of the profession of architecture as a mix of art, science and technology, course curricula has also been defined as a combination of large number of subjects which include art, science and technology involving architectural design, building construction, structure, services, landscaping, legislation, housing, building economics town planning, surveying, estimating, costing, graphics, history of architecture etc. Thus the effort is to ensure the exposure of students to large number of disciplines and subjects, during his stay in the institution. Basis of large number of subjects is the requirement defined in the Minimum Standards of Architectural Education Regulations, 1983, framed by the Council of Architecture under the Indian Architects Act, 1972. The Regulations framed in 1983, still applicable despite the fact that a period spanning over 34 years have passed and requirement of profession and society have undergone numerous changes. For any education system to sustain and grow, it has to be dynamic and must keep pace with the changing environmental, structural, economic, physical and social requirements. Accordingly, it is always critical that course contents, teaching methodologies and art and science of imparting knowledge has to be periodically updated, reviewed rationalized and redefined. For this, there must be an inbuilt mechanism available within the system of education which should provide enough freedom, flexibility and innovations to ensure its relevance to meet the needs and aspirations of society, profession and the nation. Further, contours of education must be defined by the universities and academic institutions, which have required experience, expertise and know how, in order to ensure that education remains

relevant, qualitative and focussed to the objectives to be achieved. Prevailing course curricula, focussing on standardization and rigidity, has done more damage than good to the profession with the result majority of students coming out from architectural institutions after graduation, are half baked and not of appropriate quality, to meet the basic and essential needs of the profession. Course curricula defined under the Regulations, 1983 provides for large number of subjects, study hours and marks to the engineering subjects of structure, services, workshops, surveying, estimating & costing etc. This changes the orientation of the student, who remains clueless/ confused between architecture and engineering. Considering the prevailing pattern, there is an urgent need to review and rationalize the existing regulations on priority, to provide freedom and flexibility to the universities and academic institutions to frame their own agenda for architectural education in order to ensure that education remains relevant and rational. Further, it also needs to be decided, what should be level of professional competency an Architect should possess so that architectural education is geared to achieve the defined level of competency. Architect, who is, primarily and essentially a designer, because end product of all architectural endeavour is to create a sustainable design solution, accordingly focus of architectural education should be to make him a capable designer/ expert solution provider to all architectural problems. Since design provided by architects are to be executed on ground, accordingly, architectural education must provide students with the basic knowledge of materials, activities, components and elements which go into making of the buildings. Since architects are required to work with number of other professionals engaged with structure, services, HVAC etc, accordingly teaching/learning should be limited to basics in these areas so that they are integrated in the architectural design. Any attempt to make an architect, expert in engineering and services would be self-defeating and counter-productive, diluting his core competency and focus of designing buildings. Further, architectural education must focus on Indian ethos, culture, climate in order to ensure that architectural solutions remain relevant to the Indian context. Architectural education must also focus on vernacular architecture so that Indian context of architecture is not diluted and lost in the haze of globalization and western pattern of education, which has little relevance to the Indian context.

Architecture over the years, has emerged as the elitist profession, catering only to haves, ignoring have-nots. Profession needs to be made more rational because the needs and aspirations of built environment of 832 million (69%) of the population, which live in the 6,40,000 rural settlements, are not addressed by the present system of architectural education, due to absence of Architects in these areas. Thus large chunk of built environment created in the rural areas remains outside the operational mechanism of architectural practices. In fact almost entire course curricula of architecture is focussed on the urban context and as such architects do not have much knowledge and understanding of the rural way of life, buildings in the rural areas and components/materials/technologies which go into their planning, designing and construction. Architectural education does not include, debate, define and provide for the pattern of living in rural habitat and their need for buildings. Thus the role and contribution of the profession in the rural area remains marginalised. Accordingly, rural context of built environment must be made integral part of architectural education.

Architecture should not be confined merely to the built environment, it must look within and beyond four walls of designing buildings. Since human beings are supposed to use buildings designed and built, so it will be critical that spaces created within and outside the buildings should have highest quality in order to make inhabitants social, healthy and productive. Architectural education must address the issue of sick building syndrome by eliminating buildings which are designed to promote unhealthy living. Since buildings have been found to be major consumers of energy and resources besides generators of waste, accordingly focus of Architectural education should be to impart knowledge and understanding of creating buildings which are healthy, environmentally sustainable, promoters of quality living, energy efficient, minimum consumers of available resources including land, water, wood etc, managing waste and reducing carbon footprints of the buildings to make this world more cleaner and greener. In addition, study of anatomy of buildings should also be made integral part of architectural education to give students insight of the entire context and genesis of building and its planning, designing, construction, operation, management and other underpinnings to improve their understanding/ vocabulary of buildings.

MUSHROOM GROWTH OF ARCHITECTURAL INSTITUTIONS

Starting with two institutions in 1950, the number of architectural institutions now stands at 515 (August,2017) in the country. Growth of these institutions has been largely during the last decade with states of Maharashtra, Tamilnadu, UP, Karnataka and Kerala cornering the major share. These four states jointly hold 59 % share of total institutions in the country. Mushroom growth of these institutions in a short time span has led to high degree of dilution of architectural education in the country. With number of students registered in the B. Arch course standing at 58847 on 02.12.2015 since 2008 (as per the list displayed on the website of Council of Architecture), it can be assumed profession of architecture is going to meet the same fate that of engineering, in terms of quality

of education and quality of professionals. Majority of new architectural institutions have come up in the existing engineering institutions, where they have been added as another stream offering education. Due to privatisation and commercialisation of the technical education in the country, most of the private management think architecture to be a better option in terms of economic returns due to longer course duration of 5 years as against 4 years in case of engineering, low level of investment in services/infrastructure required to start the course and speedier/easier approval from the statutory agencies. The quality of education remains least priority for the private managements. Most of these institutions have inadequate services and infrastructure. Architectural institutions are largely being run as appendage of the engineering courses. There is a problem of massification of education and educational institutions which has also given way to unethical practices in the system leading to education being run as a business these days.

Pattern of education also remains lopsided and diluted. Emerging trends of architectural education is characterised by the fact that students want to get through the course/school as fast as possible with minimum efforts. This suits both management and faculty without understanding the damage being caused to the profession. Council of Architecture has introduced a new system under which the duration of 6 months practical training has been increased to one year to be undertaken in the final year. This has resulted in course virtually being reduced to four years from 5 years, with students seeking employment in the final year. The six month training, which was placed earlier in the 7th semester, was considered useful because it oriented the students to the practical aspect of architectural practice and made value addition to student understanding of the profession during his studies. With the change in pattern, quality of student's understanding has suffered enormously. In the process, student's learning, skill, quality and design output has also been diluted to a large extent.

Architectural institutions, now urgently needs support, guidance and direction, in order to ensure that they become provider of quality education for training professionals with appropriate skill. This would help in providing quality services to the clients and society besides creating built environment, which meets the essential and basic needs of quality, economy, cost-effectiveness, operational efficiency, high indoor quality and sustainability. To achieve this, statutory institutions should now, critically and objectively, look at the existing pattern of architectural education and opening of the new architectural institutions. Further growth of new institutions should be dictated by the principles of quality and necessity. Existing institutions also need to be reviewed rationally and objectively, so that they are made to grow to become institutions of excellence/quality. From quantitative growth, the architectural education should be launched on the path of qualitative consolidation, if the relevance of architecture as a profession has to be maintained and promoted.

STATUS OF FACULTY

With rapid growth of number of architectural institutions and higher order of prescribed teacher- student's ratio of 1:8, as against 1:15 in case of engineering, number of faculty members required in the architectural institutions has multiplied manifolds. In order to understand the availability of trained manpower for the faculty positions, it will be appropriate to look at the number of Architects available in the Country. As per the Council Of Architecture (only statutory authority created under the Indian Architects Act, 1972 to register the Architects) , here are in all 56644 registered Architects in the country as on August 27, 2017. Considering the population of 1210 million (as per census 2011), India has a very low availability of Architects in the country which works out to be 4.7 architects for every one lakh of population. Analysis of the data, regarding the spatial distribution of registered architects with Council of Architecture, also show lopsided distribution of the Architects in the country with majority of Architects choosing large urban areas as their place of residence and operation. Analysis of data reveals that 22 metropolitan cities in the country hold 67.37 % (38160) registered Architects. Mumbai alone has 10.92% of Architects of the country (6186) whereas share of national capital Delhi stands at 11.66% (6609). Large number of architectural institutions are located in rural/ remote areas, with little connectivity with major urban centres where majority of Architects are located. These institutions are facing acute shortage of faculty members, both in quantity and quality, because few Architects are available in their nearby areas. Further, majority of Architects being in private practice/ service, they have little time and interest in teaching in architectural institutions. Considering the existing scenario, majority of faculty positions in the architectural institutions manned are at the lowest level of lecturer/assistant professors , and that too by the fresh graduates coming out of the colleges, without any professional and teaching experience and without understanding the professional practices. More than half of Architects (56.64 %) registered with COA are young and below the age of 35 years , out of which 10.96% are even below 25 years of age, clearly indicating the acute shortage of professional manpower available in the country in the domain of architecture. Considering the fact that prescribed ratio for faculty in architectural institutions is 1:2:4 for the Professors, Associate Professors and Assistant Professors, large number of positions at the level of Professors and Associate Professors are either vacant or are being manned

by proxy/ part time faculty. In the absence of availability of appropriate faculty, most of the professionals practising are shown as the regular faculty even when they are visiting the institution for a day or two and that too for few hours. In the process, quality of education has suffered enormously. Most of the under-graduate Architects being churned out are half baked suffering from lack of design skill and high degree of professional incompetency.

Architectural education, because of peculiarity of the profession that architects are practitioners and not theoreticians, require that students need to be trained and educated in the process of how to design and how to do a professional job. A teacher who does not know and understand the essentials, intricacies and job profile of an architect, cannot make student understand the intent, content and scope of the architectural education. Before appointing any graduate as a teacher, it will be critical that he must be made to undergo practice in the profession under a practising Architect for a minimum period of three-four years. Most of the Architects having good practice do not want to get involved in teaching, which has put the profession on the back foot. Architects, who have done commendable work in the profession, must come forward and get involved in teaching the students so that quality of education imparted becomes of a higher order. Another factor which has hampered the provision of good faculty is the absence of good institutions imparting education at the post-graduate level in the regular mode. Most of the institutions are imparting part time or weekend education, leading to creation of professionals who do not have any value addition due to master's degree they procure. Most of studies are without much research output. Thus the present practice of inducting army of young ill equipped fresh graduate architects as teachers with little background and knowledge of professional, technical, legal, ethical and vernacular issues need to be critically and objectively reviewed and ways and means must be found to ensure the availability of qualified and experienced teachers. This would require either putting on hold the opening of new institutions or review of intake permitted at higher level of 120/80 as against 40 in the existing institutions to lower down the student's intake. Further, prescribed teacher-student ratio should also be reviewed and rationalized to bring down the faculty requirements to the realistic level. Focus of architectural education should also undergo a radical change from product to process; from buildings to the people who use space. Are there right people teaching? Teaching staff need a transformative vision. Are European standards the right standards? Are we training teaching staff to be good educators? How do we assess teachers? Teachers have a relatively small role; formal teaching only makes up 10% of what students learn. Students learn from peers + practice + staff – are we taking that into account?

ELIGIBILITY QUALIFICATIONS

Qualifications prescribed at intake level of the B Arch course has been at variance in various universities/institutions across the country. As per the Minimum Standards of Architectural Education Regulations, 1983, the qualification prescribed for admission for 10+2 level pass is that student must have studied the subject of mathematics with 50% marks in aggregate besides having qualified an aptitude test. For those who have passed pre- university in 10+1 mode, the student must have studied physics, chemistry and mathematics as compulsory subjects without any restriction of minimum marks besides having qualified an aptitude test in architecture. However, as per the existing practice, students with 50% marks, having mathematics as subject of study at 10+2 level, with an aptitude test are eligible for admission in the B Arch course. The aptitude test in architecture is conducted by Council of Architecture by the name NATA and also by the CBSE in the shape of AIEEE. Eligibility requirements remained a nagging issue whether the profession belongs to the stream of art or science. Considering the nature of job, subjects to be studied, proficiency to be achieved, issues to be handled and experts to be interacted during the course of designing and execution of building projects, architect must have background of science. In this context, it is also said that course curricula for architectural education has been framed in such a manner that it includes considerable component of engineering, which essentially requires science as the background to understand the intent and contents of those subjects. Keeping in view the courses to be studied and proficiency to be achieved to discharge effectively and efficiently duties of an Architect, the issue now stands resolved with the intake qualification prescribed as 10+2 with science and an aptitude test, for admission to architectural courses from the next academic session.

ROLE OF STATUTORY BODY

Council of Architecture, which has been created under the Indian Architect Act, 1972, has been mandated to regulate the architectural education in the country. In fact most of the maladies which have plagued the profession, has genesis in the way Council has viewed and regulated the education. Opening of large number of institutions, increased intake of students, staffing pattern, infrastructure, course curricula etc are the outcome of the minimum standards defined by the Council. The role of Council has been regulatory, focussing on promoting the quantity rather than on the quality of education. Infrastructure remains priority in any institution for its recognition rather

than the quality of education, quality of faculty and quality of students learning. Inspection is viewed more as a negative process rather than a positive means to improve the standards of education. In the process, quality of architectural education has become the major casualty. Council needs to constantly review the intent, content and scope of architectural education in order to improve its quality. It must work with different universities and institutions of repute and excellence in the country and at international level to define a new state of art agenda for architectural education. Council must provide freedom to universities/ institutions to reframe course curricula, to bring innovations in the architectural education. Council must promote research and development in education in order to create professionals who have required level of professional competency. Role and operation of inspectors, appointed to inspect institutions, needs to be re-defined to make it more rational and objective. They should focus more on quality of education imparted rather than on the infrastructure available in the institute. Council of Architecture must work closely with the Indian Institute of Architects and eminent professionals, by creating an interactive forum, so that architectural education can be made to sub-serve the broader needs of the profession besides serving the communities, society and the nation. Minimum standards of education prescribed in 1983 need to be reviewed, rationalised, redefined and rewritten to make them more objective keeping in view the emerging needs of the profession at local and global levels, through a broad consultative process involving educational institutions of excellence and eminent professionals besides studying the global trends and pattern in architectural education. The intent and contents of the regulations should also be viewed on regular basis, considering the larger objective of improving the quality of education. Adequate freedom must be provided to bring innovations and new ideas, which can help Architects to address the needs of entire gamut of built environment. Role of Council will remain critical in leveraging the profession and promoting/ensuring quality of education. Council also must work out an agenda to create institutions of excellence in architecture in the country as role models of architectural education besides addressing the major issues and challenges facing the education. However, in order to change the approach and operational mechanism of the Council, its structure, composition, objectives, role, functions, pattern of functioning/operation, area of operation etc also needs to be reviewed and rationalised to make it a body, which have desired level of expertise to guide and promote the profession and education. The role of Council must change from that of regulatory body to that of a mentor, counsellor and a facilitator, in order to make architectural education most productive, effective, qualitative and rational.

Good global practices in architectural education

Globally, institutions of excellence in architectural education, have been focussing on skilling and creating core competencies among students needed for understanding and ability to write, draw, and speak and to promote thinking, dedication, self-discipline for evolving state of the art architectural solutions through connecting with people, places and ecology besides understanding relationship between people and buildings, buildings and ecology. It also envisions promoting knowledge of research methodologies, consultancy projects, and knowledge about industry, organizations and procedures related to design and project planning, to create a sustainable and environmentally responsive architecture. The above objectives are achieved through:

- **Evolution of Studio Culture** :Making studio as the hub of architectural learning
- **Experimental Learning**; involving Hands on application of concepts or ideas; Learning from experience as opposed to theories and Applied learning outside classrooms
- **Teaching based on undertaking projects of all scales** :
- **Learning by; Organising Workshops**- On crafting of functional objects- model making/ architectural designing/ construction skills/ graphics,
- **Developing Global Perspective**
- **Creating Forums** : by organising series of conferences involving national and international architects.
- **Providing Personalised Attention to students**: through advice and coaching- assigning an Academic advisor and a professional coach
- **Adopting Global Approach in Teaching** :for developing global perspective
- **Promoting Education based on providing knowledge of both theoretical and practical tools** :to ensure higher learning and better employment.
- **Promoting Learning with Commitment**: to society, environment, accessibility and sustainability.
- **Creating a National/ International Job Bank** -;for facilitating students for jobs locally and globally.
- **Making Education Broad based** : by working transversely at different levels i.e. subjects to be taught in a cross cutting/ transversal manner for better understanding / interaction with other professions.
- **Providing State of Art Infrastructure** :soft and hard for promoting excellence in learning.
- **Creating Chairs**: to promote innovations and for carrying out research projects.
- **Making students learn advanced technologies**; through

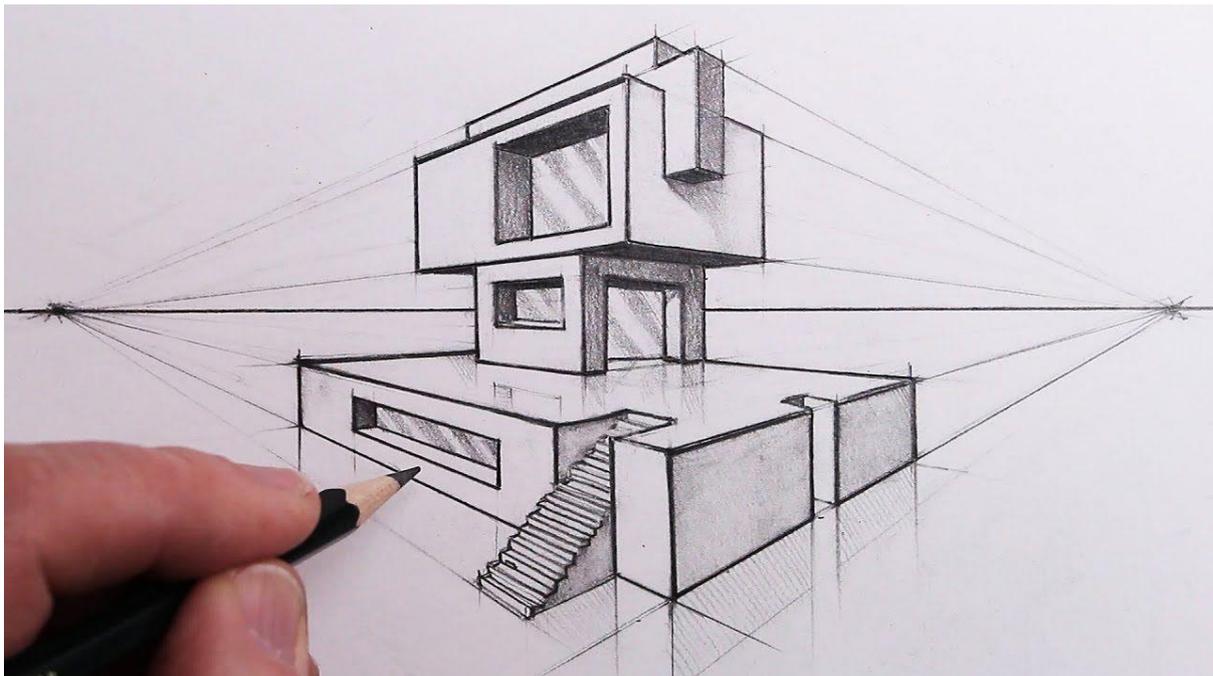
- c. How to make scaled models.
 - d. Using laser cutting machines
 - e. Using Computer controlled machines (CNC)
 - f. Making volumetric models
- **Creating Core Competency:** in students by re-orienting teaching and learning process to develop:
 - **Promoting Personal Competency:** critical thinking, creativity, ability to plan and organise, team work, leadership, self-discipline, dedication, analysis, synthesis, skills etc.
 - **Ensuring Special Competency:** in terms of
 1. Ability to create architectural designs with functions/ aesthetics
 2. Ability to perceive and understand relation between people and buildings, buildings and environment, and environment and society.
 3. Knowledge of research methods and consultancy projects.
 4. Knowledge of physical problems and various technologies.
 - **Organising Study Tours/ Visits to historical places:** of architectural importance and important modern complexes / buildings on regular basis.
 - **Promoting Interface with Institutions of Architectural Excellence-;**Locally, nationally and globally
 - **Making Research and Development:** an integral part of architectural teaching and learning
 - **Involving Professional Architects of Eminence;** as part of faculty- both visiting and regular.
 - **Hiring highly experienced and dedicated faculty**
 - **Promoting Learning through competitions**
 - **Recognising and awarding merit amongst Students and Faculty :** to promote quality, innovations in architectural learning and teaching.
 - **Promoting high degree of interface between Industry and Academia :**for making architectural education relevant to changing needs of profession, society, technology, etc.
 - **Promoting exchange of Students and Faculty:**with International Institutions of Excellence
 - **Focussing education as Learning Processes/Methodology :** rather than on the final product
 - **Making students active partners in teaching -learning process**
 - **Education to be output based rather than input**

CONCLUSION

In order to make Architectural education more focussed, relevant, rational, objective, effective and efficient, it will be critical that entire gamut of architectural education is objectively and critically reviewed and rationalised. This would require re-looking at study curricula and the manner in which education is imparted. At present entire education is teacher centric where the role of student remains passive and marginalised. This makes process of learning unidirectional / lopsided and student goes on losing the interest in learning. Teaching has to be two way process where student and teacher are actively involved in the learning process. This approach will help in improving the quality of education. Further, architectural education at present is largely input based where student remains a mere passive recipient. The pattern needs to be changed from input to output based so as to ensure student has learnt what is being communicated to him. In the subject of architectural design the focus is on the end product rather than on the process, with the result students are always looking at the readymade solutions

already available in books/net. This kills the initiative of the student and negates his creative faculties and does not make him becoming a good learner/designer. In order to promote originality and creativity, it will be critical if the student is made to learn, appreciate and understand the entire process, elements, principles, determinants, objectives and strategies which go into making a sustainable design solution. This will go a long way in improving his understanding and design skill. In this context, relevance of adopting **Outcome Based Approach** in imparting education would be highly relevant to promote better learning and improving quality of architectural education. This will make architectural education both dynamic, student centric, output based, performance and ability oriented, promoting high degree of student-teacher interaction and bringing innovations and experimentation in teaching learning process. Education should be a partnership between faculty, students and built environment stakeholders because it is not just training architects; it is training both technologists and designers.

In addition, architectural education must also be geared to meet the challenges of globalization without diluting the context of vernacular architecture; study of building anatomy right at the inception of the course and looking inside and outside the built spaces besides addressing the needs of poor and the informal sector. Education must expand the scope of architecture from buildings to communities to cities, for creating healthy and sustainable environment to make urban centres more liveable, productive, cost- effective, resource efficient with minimum consumer of resources and generators of the waste. Future of the profession will be largely contingent upon how effectively architectural education is rationalized and made objective, efficient and promoter of quality professionals.





**Chartering new agenda for Architectural Education
Post- Covid 19- Changing Role of Council of
Architecture**

Chartering new agenda for Architectural Education Post- Covid 19- Changing Role of Council of Architecture

Year 2020 will be known in the human history for its most disruptive impact on the human living, working and mobility. Known as the 'Carona Year' or 'Year of Lock down', 2020 will be considered as the year of economic and social disaster. Behaving like an invisible and imminent enemy, Covid 19 has raised question mark on the ability of human beings to counter the challenges posed by the pandemic. It has impacted both small and big; rich and poor; cities and villages besides developed and undeveloped economies but worst impacted are the most valued cities and most vibrant economies.

In the larger cities, different sectors of economy and professions have been impacted to variable degrees. Profession of architecture can be ranked among the most adversely impacted profession in the current unforeseen, unprecedented and unpredictable situation created in the human history by the invisible Covid 19. With country going for a series of lockout and curfew, to check the spread of Carona virus, real estate/ construction was the first sector of economy which came to immediate halt. This has impacted the professional architects both structurally and financially. In addition, architectural education has also been impacted adversely, with the closure of the educational institutions. The closure of institutions came in month of March- during the middle of the semester, with large contents of course yet to be covered. Architectural education came to be most impacted because core subjects including architectural design and building construction; could not be effectively taught through the remote process.

Elongated lock down and closure has posed major challenges to institutions and faculty to effectively communicate with the students. Accordingly, architectural education is passing through a difficult phase of evolution and devolution. Technology is being used to variable degrees by the institutions to communicate with students. Institutions are searching for appropriate solutions to make education more relevant, effective and efficient to meet the emerging challenges of planning and designing of creating appropriate and sustainable built environment and challenges posed by rapid urbanisation and industrialisation, besides globalisation and liberalisation of economies, to make cities healthy and inclusive. Covid 19 has made the search all the more hazy, uncertain and difficult.

In this era of uncertainty, there is need to identify the challenges faced by architectural education and profession and to suggest way forward to make the education and profession most sustainable, relevant, productive, effective and efficient. This brief writing tries to focus on existing status of architectural education in India; bringing out challenges faced and the way forward to achieve the objective of imparting quality education. Writings also tries to redefine the role of Council of Architecture, as a regulator, to ensure that architectural education is made both qualitative and globally competitive.

Challenges faced by Architectural Education in India

Architectural education involves a pentagon of stake holders which include- Students, Teachers, Management, Regulatory agencies and Infrastructure which are key determinant of quality of architectural education. Based on the understanding of the existing scenario of teaching-learning, institutional framework, faculty involved in teaching, students getting enrolled for architectural education, mushrooming of architectural institutions etc Architectural education in India faces numerous challenges in terms of ;

- Architectural education remains static, outdated, repetitive, lacking innovations.
- Education remains teacher centric- with students remaining passive partners.
- Focus of teaching- learning remains--on Input rather than Output
- Focus is on Product not on Process in architectural design
- Approach of teaching remains purely theoretical
- Teaching remains largely , 'Talk with Chalk'

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

- Focus remains on physical infrastructure and services—not on quality of education
- Lack of Research and Development in architectural teaching- learning
- Lack of involvement of Quality practising architects in Academics
- Minimum Standards of Architectural Education 1983- outdated and largely irrelevant considering the present context-- needs immediate, review, revision, rationalisation and redefinition
- Challenge posed by mushrooming of architectural institutions
- Challenge posed by education system rooted in the old British thought and philosophy
- Challenges posed by large number of students graduating every year
- Challenges posed by quality of graduating students
- Challenges posed by low wages and poor employability of graduate architects
- Challenges posed by quality and quantity of faculty
- Challenges posed by variable standards of architectural institutions
- Challenges posed by larger duration of the course- Engineering Vs Architecture
- Challenges posed by teaching methodologies adopted- lack of exposure to ground realities
- Challenges posed by poor industry-academic interface
- Challenges posed by dominance of Engineering- for institutions forming part of engineering colleges.
- Challenges posed by Regulatory Agencies- COA, AICTE, DOTE, Affiliating Universities
- Challenges posed by quality of majority of students admitted- with sanctioned annual intake exceeding 20,000
- Challenges posed by outdated curricula, quality of faculty and lack of innovations in teaching- learning
- Challenges posed by liberalisation, privatisation and commercialisation of technical education.
- Challenges posed by globalisation and liberalisation of economies- killing the local architectural traditions/vernacular architecture
- Challenges posed by ever decreasing students opting for admission to architectural courses

Way Forward to promote better Teaching- Learning in Architecture

Considering the challenges enumerated above, Architectural Education- Teaching- Learning needs to be made more vibrant, realistic, rational and focussed by making it based on emerging ground realities, understanding changes in construction technologies, involving state of art technologies, changing teaching methodologies, redefining teaching curricula and syllabus, including sustainability as the basic approach, making teaching more practical and promoting research in the art and science of teaching- learning. Accordingly following approach is suggested to promote better quality of education.

- A collaborative effort based on mutual understanding between students and teacher
- Teaching based on detailed study and in-depth analysis of real-life projects & application of new ideas, material and technology
- Education to be ever evolving/devolving to remain relevant to changing needs of society and construction sector
- Making technology integral part of teaching- learning process- Teaching 3 D technologies, Virtual Reality, BIM etc
- Looking and learning from global good practices in architectural teaching –learning followed in the institution of architectural excellence
- Making quality of education relevant to- professional needs, ethos, objectives, environment and ecology
- Changing orientation of architectural education from merely theoretical to a judicious mix of both practical and theoretical.
- Making education student-learning centric; instead of teacher focussed.
- Focussing and valuing output (learning) of student rather than input of teacher- as a measure of quality of education.
- Recognising and awarding best practices in architectural education.

- Adopting- Back to Basics- working with nature and using five major natural elements of- Prithvi, Jal, Agni, Vayu and Aakash- Panch mahabhutas as part of designing buildings
- Focussing on process rather than product to make students understand the principles of governing/guiding any activity/subject.
- Creating different skill sets, capacity and capabilities driven by state of art technologies- planning, designing, construction, operation, materials and management of built environment etc
- Making study of anatomy of building integral part of architectural education-replacing building construction, service, materials, construction technology, services, structures etc.- linking a different typology of building under construction with the teaching of every semester.
- Using Videos by students for documenting, understanding, &communicating buildings, for teaching-learning, appreciating the context of spaces, communicating designing and construction of buildings. Videos are known to be strongest, most effective, powerful and comprehensive way of telling a story; known to be the best option for teaching architecture and experiencing architecture; connecting with masses and communities; to bring alive imagined/realised spaces; expanding student's horizon and thinking about design; communicating experience of spaces/places to those unable to experience firsthand.
- Making architectural education global in nature, content and scope for creating` global graduate architects- for promoting quality and their employability.
- Reinforcing the dictum of Marcus Vitruvius Polio- Roman Architect – that art and science of architecture must revolve around- perfectly understanding human body; following proportions and understanding climate. Buildings must follow trinity of – Strength, utility and beauty.
- Having Architectural educators- persons having combined qualities of both practical architect and theoretical architect- for not only explaining/proving the intent/properties of his design but also able to carry it to its logical conclusion of successful execution on ground.
- Focussing on Educators- to make them more skilled in the art of teaching by developing excellence in communication skill; obtaining field experience; exposing them to the latest subject knowledge; improving interface with professionals; preparing well researched and qualitative handouts and promoting self-learning.
- Making sustainability integral part of teaching learning process by including it as part of study curricula to make it as key principal of designing buildings.
- Carrying out institutional reforms to create a culture and supportive/enabling environment of teaching and learning.
- To frame, rationalising and re-orienting curriculum-so as to leave enough space for teacher to innovate and bring flexibility and experimentation in teaching.
- To review, revise and redefine the eligibility criteria for admission to B Arch course by inducting a dedicated subject of architecture related subject at 10+1/2 level for attracting quality students and eliminate leftovers joining architecture.
- Changing role of regulating and parastatal agencies from negativity to positivity and creating space for institutions to grow and become competitive, both locally and globally
- Regulatory agencies to focus on promoting quality of education rather than on quantity of low quality graduates produced- avoiding mushrooming of institutions; keeping checks and balancing on institutions to eliminate any malpractices by them
- Awarding quality institutions for branding quality in education. Rating institutions on quality- based on well defined, transparent and objective criteria.
- Teaching methodology to invariably follow the dictum of --Confucius--- Chinese Scholar--who said;
 - *I Hear—I Forget; I See-- I remember; I Do--- I Understand*

Changing Role of Council of Architecture

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

In this journey of making architectural education more relevant and qualitative, regulating agencies in general and Council OF Architecture has a major role to play. The new redefined role of COA should include;

- Changing and strengthening the nature of COA from a Regulatory body to that of body dedicated to promoting of architectural education and profession.
- Changing role from negativity to positivity from policing to enabler, supporter and ensurer of quality of architecture and profession of architecture besides builder of institutions.
- Collaborating and co-operating with International Professional bodies of architecture and academic institutions of global excellence for sharing and promoting new ideas and making innovations in the architectural education and practice
- To review, revise and redefine norms and standards for minimum land, built up area, space, physical, infrastructural, students intake and faculty for architectural institutions- new and old- to make them more realistic and rational, making architectural education universal, cost effective and affordable
- Focus on making education qualitative, productive, more focussed by permitting redefinition of the study curricula, promoting innovations, experimentation, evolving new techniques of architectural teaching-learning.
- Considering the large number of existing institutions- 573(465+1) in India- putting on hold opening of the new architectural institutions. Evolving well defined, objective and transparent policy for approval of new architectural institutions- based on need, quality, credibility, commitment of the promoter institutions- to avoid mushrooming of poor quality institutions .
- With annual sanctioned intake exceeding 20,000 students – reviewing the sanctioned strength of existing institutions- to restrict maximum intake should be limited to 80 in any institution to regulate both quantity and quality of architecture.
- Strengthening in-house capacity and capability by including quality manpower to promote research; innovations in making profession qualitative; studying the best global practices of teaching-learning architecture; evolving new strategies, policies and programs to make education qualitative ; creating new options for profession in the area of designing, construction, material and management of built environment.
- Promoting research in architectural education by earmarking minimum 10% of the total budget of COA for Research and Development under a dedicated head to be spent annually. Any unspent amount carried over to the next year as additional amount.
- Redefining entry level norms for admission to B Arch courses with introduction of a dedicated subject of learning related to architecture at 10+1/2 level, followed by conduct of an aptitude test- to attract only interested students and not leftovers.
- Reviewing/rationalising/reducing the duration of the course from existing 5 years by rationalising the course contents, minimising the engineering subjects, moving focus on architecture and utilising the summer vacations for training etc. Exit option after three years could also be considered as an alternative.
- Permitting integrated courses of 6 years duration leading to award of combo BArch and M Arch degrees with architecture and specialisation in Landscaping, Urban Design, Housing, Transportation, Construction management, Environment etc
- Permitting deserving quality students holding diploma in architecture assistantship, lateral entry into the BArch course for removing undue hardship caused to deserving students
- Ensuring skill up-gradation, making value addition and capacity building of all registered architects and faculty engaged in academics by mandating them to undergo training and learning on periodic basis.
- Creating a *Think Tank* comprising of eminent architects in profession and practice to aid, advise, assist and guide the Council on all matters related to profession and academics..
- Redefining the competency of Architects in the domain of rendering Architectural/ professional services
- Re-orienting architectural education with focus to include both urban and rural settlements- for catering to 833 million rural population living in 6,40,000 villages- Creating more- Laurie Bakers in Rural India



Decoding the Council of Architecture (Minimum Standards of Architectural Education), Regulations, 2020.

Decoding the Council of Architecture (Minimum Standards of Architectural Education), Regulations, 2020.

The Indian Architects Act, 1972, mandates the Council of Architecture to prepare and define minimum standards of Architectural Education, with prior approval of government of India, in order to regulate the conduct, quality and operation of the architectural education in the country. Council of Architecture, accordingly prepared regulations for architectural education for the first time in 1983, which were known as, '**Minimum Standard of Architectural Education Regulations,1983**'. These Regulations defined and included, duration and stages of the course; eligibility conditions for admission; student's intake and migration; courses and periods of study; professional examination, standards of profession, standard of staff; equipment, accommodation, training; periods of study, subjects of examination of various stages; qualification, pay scales and designation of faculty and physical facilities to be provided in the institutions imparting architectural education. Old Regulations 1983 essentially considered the entire context of 5 year education in two distinct stages of study; with stage-1 comprising of first 3 years/6 semesters, of the study (known as Basic Course) and Stage- 2, spread over last 2 years/4 semesters, before a student was considered for award of degree in architecture and became eligible for registration with the COA.

These Regulations came under lot of review and revisions in bits and pieces. Even number of times COA, framed draft Regulations, which never got approved from the Government of India, and accordingly, there was no comprehensive revision and replacement of 1983 Regulations. Meanwhile eligibility criteria for admission to the course was revised. It changed the nature of the course, from arts to science (non-medical) involving study of physics, chemistry and mathematics in 10+2 from merely study of mathematics and english. Government also came out with National Education Policy,2019, asking entire education system both professional and non-professional to come in line with the aims and objectives defined in the new policy for skilling India; integrating local with global; providing multiple choices of exit and entry; making education broad based and liberal; promoting interconnectedness of education; making youth future ready; providing mobility and flexibility; defining five pillars of new education based on Equity, Access, Quality, Affordability and Accessibility and came up with new format of education based on a system of 5+3+3+4 etc.

Finally, '**Minimum Standard of Architectural Education Regulations,1983**', have been reconsidered, reviewed, revised and got approved from the Government of India and were notified on August 11, 2020, to be made operational from November 1,2020. These new Regulations are called, '**Council of Architecture (Minimum Standards of Architectural Education) Regulations, 2020**'. These Regulations are primarily and essentially based on 1983 Regulations, with number of changes/additions/alterations/subtractions made. Majority of changes made in the Regulations include changes, which COA was already pursuing and asking institutions to follow. New Regulations 2020, are quite detailed and comprehensive one, but these may not be able to stand the testimony of the aims and objectives defined in the New Education Policy, 2019. In number of cases, provisions made in the Regulations remain contradictory and self- defeating, which may ultimately impact the quality of architectural education in the country and cause operational problems for institutions and the students enrolled in the architectural education. However, the implications of the new Regulations need to be studied closely with regard to its outcome and impact, and would need review, revision and redefinition in certain cases. Regulations 2020, need an open debate among the architectural fraternity and academics to make it more rational and bring into the new framework of the education.

This paper tries to bring salient features of the new Regulations and its implications for the future of architectural education in the country while looking at the old Regulations of 1983. Attempt has been made to bring out the salient features; Regulations needing clarifications and implications of these Regulations, as detailed below;

i. Duration of the Architecture Course;

- Regulations, 2020,- don't precisely and specifically define the duration of the course. It states that the course shall be of **minimum duration of 5 years**. Can architecture course be more than 5 years? **The word minimum needs to be deleted from the Regulations** to remove the ambiguity and make it more precise and specific that course duration shall be 5 years.

ii Completion of the Course;

- Maximum period of completion of the course in the Regulations,2020, has been fixed at **8 years -with provision made for one year extension**, to be given once, in special circumstances. This period is at variance with the provision made by the Universities for completion of the course , **which is normally fixed at double -the duration of the course. Which in case of Architecture should be 10 years** besides additional period, given as grace period by the concerned universities. This provision related to completion of the course, by reducing its maximum period, has been made stringent; need review and revision, based on the study of the pattern followed in technical universities across India. Even in old Regulations 1983, the maximum time defined to complete the stage -1(6 semesters-- 3years) was kept as 5 years with period defined for completion of Stage -2. Fixing lesser period of completion goes against the provisions and spirit of new Education policy 2019, which provides flexibility in the shape of multiple entry and exit to students; to complete the course.
- Provision made in the Regulations 2020, regarding denial of enrolment to students in the higher semester of **Architectural Design course in a semester unless he has completed the Architectural Design course of the previous semester**- seems to be both ambiguous, unexplained and discriminatory, having far reaching implications for the students. Does Regulations mean that **student failing in the architectural design course in lower semester shall be permitted to be enrolled in all the courses of higher semester except the architectural design course or he/she has to repeat the year till student clears the architectural design of the lower semester**? Rationality of detaining a student on one subject needs study and evaluation considering its major implications for the architectural education. This provision needs clarification, to avoid mis-interpretation/loss to the student.

3 Stages of the Course;

- 1983 Regulations, provided that B Arch course would be conducted in **two distinct stages** with Stage-1- comprising of 6 semesters to be completed in maximum period of 5 years and Stage-2 comprised of 4 semesters, with no period defined for completion. These were distinct stages of study, making students learning graduating from basic to acquiring specialized knowledge of the profession of architecture. On completion of each stage, candidate was considered to acquire certain levels of skill, making him/her eligible to get a certification, after three years and a degree in Architecture after 5 years; on completion of both the stages making them eligible for registration with COA.
- Based on the analogy of course structure in two distinct stages of study- many Universities were awarding two degrees- Degree in **Building Science** etc on completion of Stage-1, which helped students, if they wanted to opt out of the course, and take up other streams – if one could not fit into the course. This provision **acted like an Exit Option without loss of any time on the part of student. Provision related to these stages has been deleted in the new Regulations.**
- New Regulations 2020, don't provide any **exit option** - which was earlier available to the students. Regulation goes against the spirit of National Education Policy, 2019, which calls for providing options of mobility and flexibility to the students- to get skilled in the area of their choice.
- **Available Exit option** under new Regulation 2020, has not been provided in the mid course but at the end of the course , that too only to those students who fail to complete the degree in the maximum defined period. Which means **exit option will become available only to those students who are not able to complete the course within 8/9 years and have earned all credits for first three years of study.**—which is contradictory and discriminatory- by denying this exit option to students clearing three years of study in normal course. Why Student should be asked to study, waste, wait and work for 8/9 years for earning **exit option** available after 3years. **Considering the implications of this Regulation, Course needs to be split in two distinct stages, as defined in the old Regulations of 1983, with separate degree awarded after completion of Stage -1 & Stage-2, to make students available exit**

option during the course after successful completion of first three years of study. Alternatively Regulations 2020 may include provision for exit option after completion of three years of study.

4. Practical Training;

- Practical training has now been mandated to be in the 8th/9th semester- which was earlier left to the discretion of the Universities to decide upon. It was normally in the 7th Semester, with 8th Semester added later, considering large number of students seeking training and due to limited options available with professional architects for training in the profession. **Regulation with regard to training in the 9th semester needs to be relooked for its larger implications. Based on the options given, most of the private institutions are bound to opt for 9th semester for practical training, which will help students to be out of institution after 4 years of study. This will practically reduce the course to 4 years. Institutions will be a gainer financially, charging fee for no teaching. Training will also lose relevance with students, who would be looking for job without gaining much from the practical training. There will also be a cut in the defined strength of faculty due to less number of students available in the institute**
- Regulations related to options given for period of practical training- **six months or one semester of approx 16 working weeks**-also appear to be contradictory, which may be misused/abused by both institutions and students through mis-interpretation. Giving this option of making a choice between 6 months/ one semester, may eventually lead to reducing the effective time frame of practical training from 26 weeks (if 6 months mandate is followed) to 15 weeks (if semester of 90 working days is followed @ 6 working days/week). **Period of practical training need to be fixed at 6 months if it has to be made more meaningful and productive and provision of semester needs to be deleted.**
- Provision regarding fate of the student - failing in the practical training viva- voce exam—after completing the practical training needs to be defined. **On failing in the viva-voce exam, will the student be required to undergo fresh training of 6 months before he is admitted to the 10th Semester?**

5. Eligibility for Admission;

- Admission to architecture course **under Regulations 2020, has been restricted to students having qualified 10+2 examination scoring minimum 50% marks in aggregate besides 50% in aggregate in Physics, Chemistry and Mathematics.**
- In addition, students having passed **10+3 Diploma Examination with Mathematics and 50% marks in aggregate** are also made eligible for admission irrespective of trade in which he holds diploma. It means all 3 year diploma holder in **architecture, civil, mechanical, electrical, electronics, interiors, computer, production** etc would be eligible for admission to architecture course. Old 1983.
- In the eligibility conditions, only two options have been given; involving 10+2 and three year diploma. It will be desirable to mention that students with Bachelor degree in science/ Interior design/Engineering/ higher qualification than 10+2 with **Physics, Chemistry and Mathematics as the subjects of study**, should also be considered eligible for admission to degree course, provided they have scored 50% marks in the aggregate at either level and passed the specified aptitude test. This would remove any existing ambiguity in determining the eligibility of students and would help in making the provision more broad-based and attract students who would like to adopt architecture as a career option by possessing higher qualifications. by choice and not by compulsion.

6. Aptitude Test;

- **As per Regulations 2020**, in addition to qualification defined above, candidate must qualify an **Aptitude Test in Architecture and that too conducted by the Council of Architecture** for admission to the course.
- **It appears that**, as mandated by the new Regulations, 2020, Aptitude test conducted by any other institution/ body/ state/ university will not be a valid test for admission to architecture course **and only COA conducted aptitude test will be valid. Even Joint Entrance Examination (JEE) score shall not be valid aptitude test for admission to B Arch course.** This means that even three SPAs , IITs/NITs and other government Institutes, **who were earlier admitting students based on aptitude test other than NATA will not be able to do so from 2021 academic session. This would need clarification in the larger interest of the students.** Earlier all universities/institutions established by law were permitted to conduct aptitude test for admission to B Arch course and also admit students based on the aptitude test – JEE. This provision will narrow down the scope of the admissions to the architecture.

7. Professional examination, Standards of proficiency and conditions of admissions, qualification of examiners;

- Provisions with regard to above are practically same in the old 1983 and New Regulations of 2020 , except in case of the examiners the experience has been increased in New Regulations from 3 to 5 years in all subjects other than evaluation of architectural thesis, where it has been increased to 10 years against 3 years. However, **new Regulations have diluted the pass marks, which were placed at 50% in 1983 regulations , find no mention in the new regulations.** In addition, under 1983 Regulations, **students failing in internal assessment were not allowed to appear in the external examination of that subject**, which has been deleted in new Regulations, 2020. Now irrespective of failing in internal marks, student is permitted to appear in the external examination of that subject, which appears to be both anomalous and contradictory and needs to be reviewed and redefined.

8 Standards of staff, equipment, accommodation, training and other facilities for Architecture education;

- Regulations 2020 has divided faculty into two distinct categories- Core Faculty and Faculty. **Core faculty comprises of architects only** which are **full time teaching staff members with valid registration with the Council, appointed by institution on regular basis.** Whereas Faculty includes- all the teaching staff- both core as well as allied faculty on the rolls of the institute and also the visiting faculty. This distinction did not exist in the earlier Regulations of 1983.
- **Teacher/ student ratio stands diluted and reduced considerably under new Regulations 2020 as compared to Regulations of 1983. As against teacher /student ratio of 1:8 in 1983 Regulations; it is now mandated to be 1:10 in the new Regulations,2020. Under1983 Regulations, institutions were supposed to have minimum 12 teachers for 100 students whereas new Regulations mandate minimum of 12 core faculty members for student strength of 200 and total faculty strength of 20 including core faculty and faculty from allied disciplines and visiting faculty, which reduces effectively the number of teachers available from 25 to 20 in the institute- reduction of 25% of faculty.**
- In the new **Regulation, 2020** the ratio of --**Principal/ Director and Professors, Associate Professor and Assistant Professors** has been fixed at **1:2:6**, which is **lower than 1983 Regulations where it was placed at 1:2:4.** So more lower level opportunities for the Assistant Professors have been created as the cost of senior faculty. In addition to reducing the number of total faculty positions by 25% (from 25 to 20 for an annual intake of 40).This would lead to having large faculty available at the entry level (Assistant Professor) at the cost of senior faculty available for teaching which is bound to adversely impact the quality of education imparted. More senior and experienced faculty would be pre- requisite and essential for better teaching-learning. It will be desirable to follow the norm of 1:3 5 for various levels of faculty.
- **Regulations 2020**, define the full time staff strength required for the architectural institutions in Appendix- B. based on the annual sanctioned intake of 40; 80 and 120. The full time staff strength

mentioned is 15, 29 and 43 for total intake of 200; 400 & 600 students for all 5 years. 25% of the workload is defined to the visiting faculty in architecture. Allied faculty is mandated not to exceed 3/6/9 for an intake of 40/80/120. Allied faculty will remain at the level of Associate/assistant professor in the ratio of 1:2. **Looking objectively at the number of staff strength defined above, it can be seen that with the increase in the number of student intake, number of faculty required has been further scaled down. In fact number of faculty members defined reduces the total staff strength and further brings down the mandated teacher/ student ratio of 1:10 in the institute.**

- Regulations 2020, state that for an intake of 40- Institution must have minimum staff of 20 faculty members,(including the Principal / Head of Department.) out of which 15 shall be full time faculty with minimum 12 core faculty including the Principal or Head, 3 faculty from allied areas and 5 visiting faculty teaching equivalents (12 hours or periods of contact/ working week considered as one teaching equivalent for visiting faculty). The cadre ratio for full time faculty shall be Principal (Professor Cadre) – 1, Professors- 1, Associate Professors- 3 and Assistant Professors – 10. Looking at the number of faculties at various levels, the senior faculty appears to be much on the lower side as compared to the senior faculty.
- **Regulations, 2020, also permit to have One Professor Design Chair** for every intake of 40 students -to be counted against Professor Cadre. However, up to 50%of the faculty members other than Professors (excluding Principal/HOD) can be on tenure basis. Professor Design Chair and other faculty members appointed on tenure basis cannot be considered as Head of the Institution or Principal or Dean or Head of Department. **However, Tenure period has not been defined which needs to be defined for considering them full time faculty. Non definition of Tenure period has all the possibility of reducing the full time Core faculty and is likely to be misused by the institutions for manipulating the number of faculty members at the time of inspection/ approval etc. Tenure period should be specified as minimum of 3 years**
- **Regulations 2020, following the pattern defined in 1983 Regulations, also define the minimum qualifications, pay, experience and structure** of core faculty. In addition, Pay level in Paymatrix is also included in the new Regulations, 2020, For **Assistant Professor (earlier lecturer) – two changes have been made in the qualification and experience-** at B. Arch. Level, candidate must have **scored minimum 60% marks in B Arch course, and must have gone through formal education in architecture.** Professional experience has been **increased from previous 2 to 3 years** . Similarly for candidates with Master degree in Architecture/ allied subjects, condition of scoring minimum 60% marks at either level has been mandated with no change in experience. However, considering the entire gamut of education and availability of the professionals at the Master level, it will be better the B Arch as a qualification for appointment as faculty needs to be deleted and only Master level candidates should be appointed with prescribed experience, for the entry level faculty.
- **For the position of Associate professor(earlier Reader)- qualification/experience provide in Regulations 2020 include -- B. Arch. and Master's Degree in Architecture / allied subjects of Architecture with minimum 60% marks at either level, and Eight years experience** in teaching/ research/ professional work out of which a full-time teaching experience of **minimum three years or Thirteen years of professional experience- which is higher than prescribed in earlier Regulations- 7 years for B Arch and 5 years for M Arch candidates. For this level recruitment, Master degree has been made compulsory in new Regulations. For the post of Professor, Regulations 2020 mandate, besides Masters degree with 14 years experience** in teaching/ research/ professional work with minimum five years full-time teaching experience Or **Nineteen years of professional experience.** Ph.D. in Architecture has been made only desirable. **However, higher experience of 5years prescribed for candidates coming from practice as compared to academics, will prove as deterrent for such candidates opting for academics.**
- **For the post of Director/Principal/HOD- qualification prescribed are same as in the case of professor with 17/20 years experience** in teaching/ research/ professional work out of which a 8 years as full-time teaching experience/professional experience. Desirable: Ph.D. in Architecture and experience in Administration at a responsible position. **However, Principal or Head of Institution shall be a regular (permanent) Employee.**

- **For the post of Professor (Design Chair),--** the qualification/ experience should include-- **B.Arch. and twenty five years professional experience** of commendable, acknowledged and published professional work and appointed on tenure basis. **Undergraduate qualifications acquired through self-study / non-formal mode not to be consider for recruitment as faculty.** The candidate must have acquired qualification through formal mode at undergraduate/ Post-Graduate level. Only **candidates registered with Council shall be eligible for the posts of core faculty.**
- **New Regulations , 2020, mandate that all newly appointed faculty members shall be required to undergo three months ‘faculty training course conducted by Council before completion of their probation period. The training period shall be treated as part of service. Council needs to examine the desirability of this provision, considering their capacity and requirement of training large number of faculty appointed in more than 450 institutions at various levels.**
- **Under new Regulations, 2020, Professional experience /Teaching / Research in the field of Architecture, counted from the date of registration with Council for core faculty /valid equivalent certification from concerned authorities** In the case of applicant coming from practice,. **Professional experience shall be substantiated by certificates from employers-**, based on Work orders/Completion certificates /Sample Drawings of the projects undertaken. Council also need to clear whether experience gained as part time faculty shall be counted or not?
- **Post Graduate Degree/ Diploma awarded by Authorities outside India-** have been mandated to produce certificate of equivalence granted by competent authority of the Central Government, for being considered for appointment. Ph.D., for recognition as a valid qualification, must be awarded by recognised Indian Universities or Institution(s) -on any topic related to various subjects of Architecture/ its allied fields. Ph.D. awarded by foreign universities/Institution(s)-- shall be considered equivalent only after production of equivalency certification from Association of Indian Universities/other competent authority of Central /State Government.
- Regulations,2020, donot make any distinction in the faculty appointed in the standalone colleges of Architecture or Colleges which form part of the Engineering Campuses and the Department of the Universities. This needs to be considered rationally, because putting them at par may not be feasible and desirable, considering the culture, qualification and requirements of faculty in the Universities and the colleges .Further, manner in which the career of the faculty in terms of recruitment/ promotion to senior level also need definition because Regulations only define the pay scales and qualifications or various positions and not the mode of recruitment/promotion. Provision of assured career promotion needs to be embedded / made integral part of the Regulations in order to avoid hardships to the faculty working for a long time. There are variations in specifying qualifications for recruitment to different faculty positions, which need uniformity. Instead of writing -PhD in Architecture- it should be written-- PhD in Architecture or allied fields-& similarly for - Post Graduate Degree in Architecture, it should be written as Post Graduate Degree in Architecture or allied fields- so as to remove ambiguities prevailing in qualifications written at different places.
- Regulations 2020, also lists the requirement of non- teaching staff required for the institution
- **Regulations 2020 also mandates that selection committee of faculty for selection/promotion will include** one nominee of the Council, except for Centrally Funded Technical institutions (CFTIs), which was not part of 1983 Regulations. This process restricts the autonomy of the universities/institutions and also has become the breeding ground for promoting favouritism/vested/ personal interests in Council besides causing huge financial liability for the institution/ universities recruiting faculty. Provision needs review/rationalisation/deletion to be made more objective and transparent.
- **Regulations 2020, mandates that COA will define/ publish, every year the Academic Calendar to be followed by institutions for commencement of the Architecture course. Desirability, usefulness, implications and objectivity of this Regulation need to be studied, understood and appreciated, considering the regional variance; prevailing geo-political situation in the country and impact it will have on the and freedom of the Universities to decide their own academic calendar.**

APPENDIX-A

9 Courses, Periods of Study and Subjects of Examination, under Choice based Credit System for the Architecture Degree Course

- Regulations 2020, first time introduces the **Choice based credit system in architectural education.**
- System divides subjects of study -- into four distinct streams involving; **Professional Core ;& Building Science and Applied Engineering Courses-- which remain compulsory.**
- In addition, student also required to study;
- **Professional/ Open Electives;** and
- **Employability Enhancement Courses (EEC) – -Employability Enhancement Compulsory Courses (EECC)/Skill Enhancement Courses (SEC) -- which are choice based.**
- Respective weightage of these courses are to be ;
- **Professional Core Courses (PC) : 50 %**
- **Building Sciences and Applied Engineering (BS and AE) : 20%.**
- **Professional Electives (PE) : 10 %.**
- **Open Electives (OE) : 5 %**
- **Professional Ability Enhancement Compulsory Courses (PAECC) : 10 %**
- **Skill Enhancement Courses (SEC) : 5 %**
- Where there is no possibility to offer Open Electives-- Professional Electives may have a weightage of 15 % of total credits.
- **Regulations 2020, details out the suggestive list of 52 subjects to be included in 4 different courses;** Professional Core Courses-13; Building Sciences and Applied Engineering (BS and AE)-10; professional Elective Courses-19; Professional Ability Enhancement courses-4; Skill Enhancement courses-6.It provides for flexibility / innovations to be adopted in teaching- learning at the institute level, providing flexibility to students; giving brief and methodologies to be adopted for teaching different subjects; teaching outcome; besides credits to be given for lecture/lab/studio and credits for the practical training. **Old Regulations 1983,** had listed all **26 subjects to be studied** in the entire 5 year period which included 13 subjects to be studied in stage-1 & 13 subjects(including 7 electives) to be studied in Stage -2 of the course. It also gave division of the periods to be allocated for each subject. In addition, Regulation provided flexibility/choice to the university/institutions by reserving /earmarking 25% of total periods for them depending upon their specific needs. In addition, it gave in brief of the intent of the each subject to be taught. The list of courses suggested need detailed study and analysis and their suitability for the profession of architecture.
- **Regulations 2020,** suggests the adoption of weekly schedule of 26- 30 teaching hours /week divided into ¾ lecture based courses@3 lectures/course; 2 lab/workshop/seminar/studio of 6 credits and Design project of 9/12 credits- **with total credits for the course varying between 260 -300.In addition,** Regulations in brief define the intent and description of the 52 courses and the guidelines for the conduct of practical training and architectural Design thesis. **However, Regulations,2020, donot define the structure of the course where and when the electives related to skill and profession will be started. Will they be made part of the study right from the first semester or will be taken up in later semesters. They are supposed to jointly carry 30% of the total weightage of the distribution of marks. In case of adoption at higher level of study, distribution of marks defined at lower level of study, would need detailing and redistribution.**
- Regulations 2020, for making applicable at the institution level, will require to be made integral part of the study curricula of each university/institution. It will also require redefinition, restructuring and re-writing of all the existing syllabii. COA will do well to initiate, a dialogue with all the universities and the institutions of excellence to understand the implication of the subjects of study, structure of the course, subjects to be taught, framework of study, methodology of teaching-learning, intent, content and scope of the subject etc and come out with an appropriate and rational framework for the suggested syllabus for adoption/ teaching and also bring it in line with the defined aims and objectives of National

Housing Policy, 2019. Regulations will need review, redefinition and restructuring based on those deliberations.

APPENDIX-C

10 INFRASTRUCTURE REQUIREMENTS

- Under this head, Regulations 2020, define the infrastructural requirements in terms of space standards for studio, lecture room; Labs and Workshops, computer centre, library, HOD/Principal/staff room,, staff lounge, construction yard, student's common room/rest room, other desirable spaces; labs/workshops etc
- **LIBRARY FACILITIES –**
- As per new Regulations, Institute must procure minimum 300 books on subjects of Architecture for the intake of 40 with minimum 100 titles on -1st Inspection.150 books (minimum 50 titles) for every additional intake of 40.
- From 2nd year onwards,-- minimum 120 books on subjects of Architecture (40 titles) for every year per intake of 40 .Old schools to have more than 5000 Titles; and should acquire minimum 10 titles on subjects of Architecture per intake of 40 every year. In addition institute must subscribe to Indian/international Journals and Periodicals of architectural relevance @ 40/80 and above -2 ind+8int./ 4ind+10int. E-books and e-journals along with computer terminal with net facility for reference..At least 2 Refereed journals (Min. 1 international) per intake of 40 shall be subscribed
- **COMPUTER CENTER**
- For intake of 40/ 80/ 120, computer lab having computers 20/40; will be required with licensed software ,printers, plotters, scanners, etc; Upgrading of systems (hardware and software) done every three years.; Computers more than three years old not counted as part of lab; Broadband internet connectivity of appropriate bandwidth to be available to all computers and campus. Period of three years specified for the validity of computers needs to be seen for its financial implications and desirability. Instead of time , better it would be to provide specifications for the soft/hardwares.
- **LAND REQUIREMENTS:**
- **Under Regulations,2020-. University/ Institutions must possess a Minimum 8000 Square meter or Independent/ undivided and contiguous share of land; adequate enough to provide for contiguous built floor space of 2,000 Square meter for intake of 40 candidates, 3,000 Square meter for intake of 80 candidates and 4,000 Square meter for intake of 120 candidates in Architecture**
- Sufficient additional space for sports, co-curricular activities / hostel, canteen/ other facilities will be required.
- Land on which building University located /built-- must be institutional land & must be owned by trust /society/ company.—Council may relax above on case to case basis for University/Institution located in hilly areas.
- **Under 1983 Regulations;** area of the land required was not specified, instead it asked for a built-up area@ 15sm/per student to be provided in the shape of class room and studios besides space for faculty, library, workshop, materials, museum., labs, conference, common room for staff/students and other essential activities. **Looking critically and objectively at the area norms; As against carpet area specified under old Regulations, 1983, institute with 200 students should have a covered area of 3000 sqm; 6000 sqm for 400 students and 9000 sqm for 600 students admitted based on the annual intake of 40/80/120; which under the New Regulations 2020 have been reduced to 2000/3000/4000 sqm There is a reduction in area to the extent of 50% or more from old to new Regulations. As per new Regulations 2020; the available covered area/ student works out to be 10 sqm/ student for an annual intake of 40 students; 7.5 sqm/ student for an annual intake of**

80 students; 6.66 sqm/ student for an annual intake of 120students;- as against 15sqm prescribed earlier. Further earlier it was carpet area under 1983, which has now been converted into built up area under 2020 Regulations, meaning that carpet area available will be further reduced to, 6/ 4.5/ 4 sqm for intake of 40/80/120- leading to high degree of congestion in terms of spaces available for student education/other activities etc However, there is no corresponding reduction of facilities/amenities/ infrastructure defined to be provided, which is a gross contradictions and needs to thoroughly looked into and corrected.

11, Conclusions

Council of Architecture needs to be congratulated for making it possible to redefine the Minimum Norms for Architectural Education, after a span of 37 long years and make it more comprehensive and detailed. However, these Regulations of 2020 appear to be restrictive at many places and ignore number of good points of earlier Regulations of 1983. New Regulations tries to assert the supremacy of the COA in all matters relating to education including both its intent, contents, approach, administration and method of imparting. In certain cases it impinges on the autonomy of universities, which are primarily and essentially, mandated to maintain the quality of education. New Regulations, tries to control and regulate the entire mechanism of architectural education, including defining the course structure; subjects to be studied; division of subjects in four distinct categories; fixing of fees and selection of faculty, giving little freedom to the state governments and Institutions/Universities imparting architectural education. Looking at the intent and content, new Regulations 2020, it may not be able to stand the testimony of the aims and objectives defined in the New Education Policy, 2019; which call for transforming the intent and content of education; make it more flexible; shift focus from- what to think to how to think; empowering institutions of higher learning through granting autonomy; promoting quality education through innovation and Research; integrating local with global; providing multiple options for exit/entry; making education broad based and liberal; interconnecting education; bringing professional education to mainstream undergraduate education; making every moment spent by the student to be productive; providing for liberal art and vocational education etc and accordingly may need review and redefinition.

- New Regulations, 2020, donot take much into account and value the role and importance of technology in the teaching- learning of the architectural education. Looking at the current scenario and the global trends, architecture has to be embedded with technology to make it more effective and efficient. New technologies will help in imparting quality education by connecting students with the best of architects in practice to share their thoughts, ideas, philosophies and vision with the students. Best of the teachers across the globe can be made integral part of teaching-learning through technology. Technology, which cuts down all the travel and need for physical contacts, can be effectively leveraged by Council on collective basis or individually by institutions, to promote quality education. Technology is known to be a great leveler and has enormous capacity to make education both efficient, productive, cost-effective and qualitative. Technology and learning new software for planning, designing, construction, creating virtual realities, walk through, virtual buildings etc can help students connect with professionals, both locally and globally, for learning and earning. Accordingly, technology and ICT must be made to integrate with the education on priority. Institutions should be asked to involve students and faculty, to innovate and evolve systems and processes, to create better options for teaching –learning architecture through the use of technology.
- Land requirement and built up area requirements specified remain contradictory in the Regulations 2020. Built area requirements have been drastically cut down, even to the extent of more than 70%, with no corresponding scaling down of the infrastructure to be provided. Reduction in built area will lead to high degree of congestion which will adversely impact the quality for teaching- learning and student’s activities in the institutions. Entire space norms per student have been worked out on the principle of – adopting inverse ratio/relationship between space requirement and the number of students -e g higher the number of students lesser will be the built area required per student,- which principally should have been otherwise and opposite. With higher number of students large area would be required in the institute. Provisions need to be reconsidered and redefined to make them rational.
- Council should also consider the situation created by mushrooming of large number of architectural institutions(463)in the country, which has primarily led to decline in the quality of education imparted. Opening of the new educational institutions should be need based with a focus on quality of education.

Setting up of new institutions should be considered only where, there in reality exists shortage of institutions, considering the number of students opting for architecture as a profession and are required to go to other places for study in the absence of institutions. Further, quality faculty in adequate number is available in such places. Quality of education has suffered enormously, due to non-availability of quality faculty in majority of institutions. Most of institutions are manned by proxy senior faculty, whose name exist only on papers and are never involved in academics.. All the existing institutions, other than national institutions of SPAs, NITs, IITs, Institutions set up by state Governments & state technical/government led universities, must be asked to undergo quality audit to determine their status. In addition, institutions with annual intake of 120, also need to be closely audited for quality of education imparted. As a principle, Council must put a ceiling of annual intake of 80 students for any individual institution as against existing norm of 120 students. Looking at the intensiveness and focus of the education, it is too difficult to do justice with the educating students when their number increases even beyond 40. COA has also come out with a policy for setting up of new architectural institutions in the country till the year 2030. It takes into account the population of the state, number of architectural institutions already existing in the state, number of seats sanctioned, spatial location of the institutions in the cities etc and categorizes country into different zones, where new institutions should be promoted, limited and prohibited. Study lacks objectivity and focus. It merely looks at the physical data, without analyzing the reason of concentration and absence of such institutions at different places. It ignores the strength and weaknesses of places leading to concentration/absence of architectural institutions. Report needs critical and objective review to make it rational and meaningful. Infact COA should ask the Government of India to start courses in architecture in all the reputed IITs and NITs (at present only 2 out of 23 IITs & 10 out of 31 NITs run courses in architecture). Similarly in each zone one School of Planning and Architecture must be set up so as to produce quality professionals in Architecture.

- For improving the quality of education and to make it more broad based, COA should undertake an objective study of financial cost involved in creating/setting up of an institution having annual intake of 40, 80 or 120, based on the fee charged by the COA and other agencies; space norms specified; infrastructure to be provided; faculty and staff to be hired and payment to be made; cost implication of equipment to be arranged; number of books and furniture to be purchased; land to be sourced, built up space to be created, cost of making the institute operational, maintenance cost; cost of other services specified in the Regulations 2020. This will help COA understand the upfront cost implication of setting up a new institution and cost of imparting education. Study can help in evolving strategies and options to make architectural education cost-effective and affordable. Many poor talented students, who are deprived of the opportunity of higher learning because of the high fee and other charges levied by the private institutions, would be able to pursue the architectural education. It will go a long way in changing the nature of architectural education from the elitist to that of for the masses. It will also help in rationalizing and redefining the infrastructure and services to be provided in the institution. Instead of granting higher intake of 80 students in one session, if the institutes are given student intake of 80 to be run in two different shifts of 40 students each, both morning and evening, it will not only reduce the space/ infrastructure to be provided but will also promote optimum use of available infrastructure. Cumulatively this would make the education more cost-effective besides improving the quality of education imparted in two manageable segments. Number of good practicing architects, who don't get involved in teaching due to their daytime pre-occupation, can also, offer their expertise in education during the evening. This can also help overcome the shortage of quality teachers in the domain of architectural education besides improving quality of education.
- Council also should seriously consider the option of allowing institutions in larger cities to run evening classes in the institutions to take care of large number of diploma students who are already in job and want to improve their qualifications. These students have to leave their jobs for seeking admission to the degree courses, which causes lot of financial hardships to the parents and students who want to pursue the degree course. In addition, number of aspiring and deserving students are deprived of the option of improving their qualifications. Many architectural colleges now have adopted the mechanism of enrolling such students, who don't come to colleges regularly or attend classes only on part time basis and appear in the exams only to get a degree. In order to check this malpractice and to provide adequate facilities for in-service students for career promotion, Council should permit running the evening courses on a selective basis like ND Arch course run by SPA Delhi earlier. Instead of increasing the intake in the colleges, if the option of running the courses in the evening is given, it will help in not only making intensive use of the existing infrastructure but will also help in making education cost-effective, qualitative and bringing many deserving/aspiring students to the profession.

- In number of cases, provisions made in the Regulations remain contradictory and self-defeating, which may ultimately impact the quality of architectural education in the country and cause operational problems for institutions and the students enrolled in the architectural education. Attempt has been made to explain these contradictions in the context while explaining the provisions of the new Regulations in the text above, besides labeling issues which have not been addressed in the Regulations. They would need consideration and appropriate solutions. These would include;
- Aptitude test
- Provision regarding Exit option
- Provision regarding admission to the higher semester- architectural design
- Practical Training- duration and semester
- Maximum period for completion of the course
- Defining the Academic Calendar
- Compulsory faculty training of 3 months by COA, before completion of Probation period
- Dichotomy between faculty coming from academics and profession-- with much higher experience prescribed for people coming from practice.
- Faculty in the University Vs stand alone colleges/ integrated campuses.
- Provisions regarding career management and assured career promotion.
- Methods of making Architectural teaching- learning, more qualitative, effective and efficient
- Attracting quality students in the architectural institutions
- Attracting good architects in the academics
- Making architectural education more students centric.
- Making students exposure higher, larger and broader.
- Incentivizing good work done by the faculty in the areas of academics/practice
- Changing role and importance of Technology in the face of changing ground realities
- Making architectural education more competitive and global
- Documenting good global practices for teaching- learning architecture
- Specifying period of tenure appointment
- Safeguarding the interests of the faculty in case of discrimination
- Applicability of the electives and skill based subjects
- Contradictions between the space norms and the built area prescribed.

.Regulations 2020, for making applicable, will require to be made integral part of the study curricula. It will require redefinition, restructuring and re-writing of all the existing syllabus. COA will do well to initiate, a dialogue with all the universities and the institutions of excellence; to understand the implication of the subjects of study; structure of the course; subjects to be taught; framework of study etc and come out with an appropriate and rational framework for the suggested syllabus for adoption/ teaching and also try to bring it in line with the aims and objectives of National Housing Policy, 2019..

However, the implications of the new Regulations need to be watched closely with regard to its outcome and impact, and would need review, revision and redefinition in certain cases. Regulations 2020, need urgently an open, free, frank and objective debate among the architectural fraternity and academics to make it more rational and to bring it into the new framework of the education. Council should create a common platform for all educational institutions to interact and explore possibility of mutual co-operation and collaboration to support in promoting quality of architectural education provided. Council should also consider the option of incentivizing the promotion of research and innovations by awarding research based projects in architectural teaching-learning. It should consider the option of earmarking dedicated funds to the tune of 20-25% of its annual budget for promoting research in education. In addition, it must consider actively collaborating with the national institutes created for training of technical teachers (NITTTR) created pan-India by the Government of India for running dedicated courses in architecture for training of the faculty engaged in architectural institution for skill up-gradation and promoting quality teaching in architectural education. Regulations, 2020, should be looked at, as an instrument of ushering a new era in the quality architectural education and raising the bar of the profession for its recognition, and value it would create to promote public welfare and sustainability in the built environment.

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

Regulations should be used, in the best possible manner, for promoting positivity and expanding positivity only and for capacity building of the architectural institutions, faculty and students.

Considering the existing fabric, structure, operation and working of Council of Architecture, there is an urgent need of its empowerment, capacity building and strengthening by inducting technical and professional manpower and resources including redefining its role in architectural education. Instead of actual doing and providing everything in the domain of architectural education, Council should change its role to that of enabler, supporter and builder of effective and efficient systems of delivery of architectural education. This would help in making qualitative improvement in teaching-learning of architecture. Achieving this objective would require empowering Council of Architecture, by inducting quality professionals in its structure, operations and management for making it institution of excellence, dedicated to promoting research and development in the area of education; making it more professional, rational, effective and efficient besides promoter of quality architectural education, professionals and profession of architecture in the country.



Leveraging Videos for Redefining Architecture and Planning in Urban India

Leveraging Videos for Redefining Architecture and Planning in Urban India

i. Introduction;

Role of technology has already been well recognised in the area of banking, delivery of goods and services; ease of doing business; transferring money; booking and reservation of seats for travelling; communication; transmitting information; managing traffic and travel etc. Technology has changed our way of living, working, leisure etc. and has simplified numerous processes reducing time, minimising human involvement and making processes both cost effective and efficient. Recent pandemic has showcased how technology can be leveraged in imparting education and facilitate teaching and learning besides doing other activities like sourcing household essentials, working from home, learning /teaching from home, holding webinars to deliberate on current issues and challenges etc. Technology holds enormous potential for rationalising numerous processes and in fact in the years to come technology will be the major driver to dictate human living and working. Even majority of decision making shall fall within the domain of technology. Looking at the entire context of technology of tomorrow, paper is trying to enumerate the area in which video can be game changer in the urban context and in the architecture and building industry. Using Video effectively and efficiently, can go a long way in making architecture and planning education quiet qualitative, analytical, objective and realistic. It can help student understand the genesis of planning and designing of cities and buildings and help them to make buildings/cities more rational, sustainable, safe, resilient, cost-effective and resource efficient.

Video, as a medium of communication, is known for its convenience, efficiency, versatility and shareability. Video has enormous capacity, capability, potential and power to;

- Resolve most of the urban ills
- Make this world great place to stay and work
- Power to connect nations globally
- Connect people and governments
- Make world a small village
- Promote better planning and designing of buildings/communities
- Making buildings green
- Making teaching-learning better, cost-effective and faster
- Make healthcare universal, cost-effective and efficient
- Make urban conurbation, visioned by Patrick Geddes a distinct reality
- achieve Sustainable Development Goals defined by UNO
- Achieve co-operation of Nations to solve global problems
- Bring all stakeholders on the single platform
- Bridging gap between ground realities and policy makers
- Creating systems which are more transparent, effective& efficient
- Capacity of being leveraged both for positivity and negativity
- Video systems has large variations --in display resolution, aspect ratio, refresh rate, colour capabilities and other qualities.
- Has grown from television commercials in 1960s- to today's YouTube, Snapchat, Vimeo, Facebook
- Live video -- a staple of our everyday live
- Billions daily watch online videos .
- Indians average spent 30 minutes on watching on line videos in normal period
- Considerable increase in Covid 19 period
- One day India will rule the world in use of technology/videos

- 75 Million people in U.S. watch online videos everyday
- Mentioning word 'video' in email --click-rate increased by 13%.
- Nearly 50% of video watched on mobile device
- By 2020-internet video traffic -80% of all consumers Internet traffic
- Online video -- 600% more effective marketing tool than print / direct mail combined
- Study made--Viewers retain 95% of a message when they watch in video- compared to 10% when reading in text.
- In 1951 -- first video tape recorder captured live images from television cameras by converting camera's electrical impulses and saving information onto magnetic video tape.
- Video recorders-- sold for US \$50,000 in 1956
- Videotapes cost US \$300 per one-hour reel.
- in 1971, Sony began selling video cassette recorder (VCR) decks and tapes into the consumer market
- Technology, through constant innovations, ranks one among few of the commodities which has made this world and its operations both cost-effective, efficient and productive

ii. Role and Importance for Architecture and Cities

Video has great role and promise in;

- Planning, developing and managing and conceptualizing cities
- Making cities Smart
- Making cities safe from crimes
- Making cities safe against disasters- Manmade/ natural
- Managing urban traffic
- Managing infrastructures and services in Cities
- Making Cities Clean and Green
- Promoting Good urban Governance
- Connecting communities , people and governments
- Understanding cities in real life
- Making Construction Sector – safe, efficient, productive
- Making cities connect globally
- Sharing Technologies
- Sharing Good Practices
- Making health care accessible to all.
- Making Education accessible to all
- Understanding problems and issues facing people and communities
- Addressing people problems and grievances
- Bringing people, communities, institutions and nations on single platform

iii. Making Cities Smart

Video/technology has capability to make cities smart by;

- Rationalizing urban planning
- Sustainable shaping and sizing the cities
- Making cities compact
- Planning for efficient/economical services
- Monitoring/Ensuring efficient service delivery
- Monitoring services/infrastructure
- Addressing public grievances
- Connecting with communities
- Promoting Good governance
- Making cities people centric

- Making cities safe
- Bringing transparency in decision making
- Rationalizing traffic and transportation
- Managing green spaces
- Monitoring /managing energy / resource usage in an efficient manner

iv Data collected through IOT devices / sensors used for--

- Optimising city operations/ services
- Connecting with citizens in a more efficient manner.
- Changing Governments role in innovation /smart city planning- to promote: technology; talent and trade.
- Technology provides foundation for digital /traditional companies to— grow / engage in smart city development.
- Make city development smart,
- Create equal opportunity for all citizens
- Provide basic infrastructure/Communications infrastructure to connect education system -at university/ polytechnic colleges, to act as gateways for tomorrow's talent/ digital workforce.

iv Virtual Denmark:- Minecraft

Virtual Denmark Minecraft-

- Learning Tool for Danish Students
- Largest-selling video game ever made
- Allows players to design/ construct every aspect of their environment in infinite amount of space
- Placing unlimited possibility in hands of gamers / countries.
- Danish Broadcasting Corporation -- recently recreated entire country of Denmark on a 1:1 scale in world of *Minecraft*
- Allowing players to log/explore/ modify their model.
- Educate Danish citizens on geography /design of counties.
- Offer entertaining experience
- Learning how cities work.
- Balancing transport, industry, crime-prevention/ energy consumption with economic growth,
- Educating people --Placing industrial parks too close to residential neighbourhoods, harms health
- Poor design in roads, infrastructure/ investment, creates congestion and stifles growth
- Playing mine craft games does not make a person---city designer/urban planner
- Games offer a chance to think/rewarded for ---
- Pursuing sustainable approaches to city design.
- Run cities on renewable energy and
- Prioritize quality of life.
- Knowing basics of good urban design.
- Has ability to generate dynamic communities.
- As teaching tools for urban planners
- Improving their skills for reaching others online large websites/forums
- Connecting communities, otherwise remaining disconnected.
- People discussing real world problems/ share research / brainstorm
- Evolving Solutions –how to build successful cities & promote sustainable urban planning.

v Rationalizing Traffic and Transportation

Video used effectively to rationalize traffic / transportation by—

- Generating traffic data for city/ parts of city
- Carrying out traffic surveys

- Evolving traffic operation plan
- Tracking Vehicles
- Monitoring traffic
- Resolving traffic
- Tracking accidents
- Checking violations
- Managing Parking
- Rationalizing traffic
- Tracking buses
- Planning for mass transportation
- Tracking traffic at junctions
- Redesigning junctions/rotaries
- Monitoring signals
- Involving communities
- Ensuring last mile connectivity

vi Video and Architecture

In addition to numerous uses of Video in different professions and activities, they can also be used effectively and efficiently, in the domain of architecture and built environment, both in practice and academics. Based on the studies made in most of the universities in America, it has been proved that Video remains most powerful tool for teaching and learning architecture because Video has been found to be;

- strongest, most effective, most powerful, comprehensive way to tell a story
- Best option to teach Architecture
- Best option to Experience Architecture
- Best to connect Architecture with masses/ community
- Bringing alive -- imagined /realized spaces
- Communicating experience of spaces /places -- to those unable to experience them first hand
- Teaching video – Expanding students thinking about design.
- Telling builders, engineers, developers, --to help understand architectural stories.
- Engaging people --- to understand design process
- Dissolve barrier
- Creating dynamic environments for all.
- Consolidates architecture --into a single medium
- Producing stories for architects
- Best model for telling design story
- When combined with 3D modelling --show full design process /concept
- Weeklong, full-time course, Architectural Filmmaking: --- Behind the Façade--,
- Using video-- as a way to understand/explain architecture
- Visual storytelling --Communicate essence/ experiential qualities /embedded architecture within these buildings
- Process of capturing, abstracting /editing - create deep experience
- Has Power/medium of film-- for students studying/designing architecture
- Learning to understand cities /their operations/problems
- Showcasing urbanistic conditions of New York
- For investigating most compelling urban conditions
- Developing a short video to communicate issue --while showcasing a possible solution
- Creating Organization -- The League of Architectural Filmmakers and Storytellers (LAFS)
- to bring together Professionals involved in providing storytelling/ cinematography/ filmmaking services to architecture, to use video as a way to tell stories about city around us

vii Promoting Building Industry

Video is also known revolutionizing construction industry by;

- Targeting contractors/developers and distributors
- Promoting operational economy, efficiency, safety for monitoring;
- Pace of construction
- Quality of construction
- Security of materials
- Bringing all members on same page
- Resolving all issues without going to site
- Making available all construction related data
- Rational decision making through
- 3D printing
- using Drone Technology
- Using BIM
- Virtual Reality

viii Conclusion

Video has enormous capacity to promote, create /ensure standardization of product, processes and operations besides;

- Capacity to generate vital urban related data
- Have a real life operation of city
- Capacity to make cities function rationally and orderly
- Capacity to rationalize decision making based on ground realities
- Capacity to replace human beings from mechanical operation
- Making urban operations more economical and efficient
- Making basic infrastructure/service delivery efficient-cost effective
- Capacity to remove human based error
- Capacity to bring transparency in decision making
- Promote Connectivity between communities/institutions/ parastatal agencies- both locally and globally
- Capacity to bring all stakeholders on same platform
- Involving communities in planning, development, decision making
- To make architectural/planning teaching-learning qualitative and efficient
- To empower students I understanding ground realities
- To minimize travel and traffic
- To Reduce mobility and improve accessibility
- To reduce pollutions in the city
- Promoting Good Governance– making governance cost effective/efficient
- Making Living Cost- effective --Making cities more livable and sustainable
- Reducing travel and traffic/pollution
- Making cities Clean and green- managing solid waste management
- Making cities safe for communities- against crime
- Preparing cities for meeting disasters- natural/manmade
- Monitoring growth and development of cities- both planned/unplanned
- Checking haphazard, unplanned and illegal construction
- Planning for slums and affordable housing
- Empowering and capacity buildings of communities
- Making universal Healthcare affordable and accessible
- Making Education universal and affordable
- Learning from Good practices- local and global

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

- Creating a knowledge sharing platform
- Creating knowledge based global society
- Meet sustainable Development Goal-11,
- Creating Inclusive, Resilient and Sustainable cities& SDG 17
- To make building industry cost-effective and efficient.

However, checks /balances / standardization required to check content/intent to avoid misuse /abuse of technology.





Future of Architecture in India

Future of Architecture in India

As mother of all arts and definer of the built environment, architecture as a profession, has been integral part of human history showcasing its art, culture, heritage, growth and development. Architecture shall continue to transcript the journey of human civilisation till it lasts on the planet earth. Architecture is, primarily and essentially, concerned with the art and science of planning and designing buildings. Buildings are known to be consumers of energy and resources besides generators of waste, accordingly sustainability of this world depends largely upon how buildings are made least consumers of resources and generator of waste besides creating environment which promote health and happiness to the users to make them more productive.

India at present is passing through a phase of enormous transformation in structure making it more urban than rural. Ever increasing population pressure coupled with rapid urban-rural migration is making cities grow in size and activities. Cities are fast expanding but the growth and development is marked by exclusion, poverty, dualities and contradiction. Poverty, pollution and population are driving cities, which under the pressure of enormous population are unable to meet the basic human requirement of shelter , land , water and basic infrastructure. This is a great threat and opportunity for architects, who should come out of their shell of designing buildings and should look at larger spaces of the cities to make them more liveable and sustainable. Architecture can change the typologies of the cities to make them more compact to minimise travel; create buildings which are affordable, cost-effective and sustainable. Architects can help in making cities smart and providing housing for all a reality. They can make cities more humane with least promoters of global warming with their innovative design solution for cities and buildings. Architects can launch cities on the fast trajectory of growth by designing state of art infrastructure and services. However, this would require change of mind set, re-orientation of profession and professionals based on re-defining the agenda and approach to architectural education to produce quality professionals to make architecture really effective, efficient and focussed to the task of promoting quality of human life and creating a sustainable human settlements. Future of Architecture in India will be largely depend upon how we architects do our duty with understanding, sincerity and commitment. Mushrooming of architectural institutions and production of half- baked professionals will have to be stopped immediately to save the profession.





**Suggestions regarding improvement of the
profession of Architecture**

Suggestions regarding improvement of the profession of Architecture

For improving the status of the Architects and profession of Architecture in India, following agenda for action is suggested;

- Indian Architects Act 1972, needs to be amended to bring architectural practice under the domain of the Act in addition to registration of Architects
- Hon'ble Supreme Court of India needs to be again approached with the request to reviewing its judgement on Indian Architects Act, by making addition to advise Government of India, to amend the said Act to include the architectural practice, otherwise it may cause irreparable loss to the resources, environment, nation and communities with unqualified persons designing/ supervising the buildings.
- Profession of Architecture should be shifted and made integral part of Ministry of Urban development and Poverty Alleviation at the National level instead of HRD Ministry.
- Creating appropriate and suitable/ supportive mechanism like group insurance etc in order to safeguard the interest of the professional architects in case of any tragedy or onset of a sudden calamity- like Covid- 19.
- Redefining the competency of Architects vis-à-vis Engineers and others in the National Building Code and other codes with regard to designing of buildings to clearly establish the higher and exclusive competency of Architects in the domain of designing the buildings, landscaping etc for the services defined by COA.
- Delinking the process of registration under Indian Architects Act, 1972 from the qualification of Architects. For providing more credibility to the profession, registration process must be redefined to ensure that only those graduates are registered who obtain necessary competency and experience to render the services as architects in the practice.
- There must be single registration provided for the architects which should carry validity in the entire country with no other registration required. Each architect should be issued a unique registration number for practising as architects, which should hold validity in the entire country.
- Only registered architects should be empowered to do the self certification of the building plans along with issue of the completion and occupation letters based on the conditions defined.
- Amending building bye-laws of municipal/ development authority/improvement trusts and other parastatal agencies, involved in the approval of building plans etc to provide that only qualified architects should be permitted to prepare building plans, supervise and issue completion/occupation certificates.
- A cadre of Architects needs to be created at the levels of both Central, State and UTs to make architects integral part of the planning, development and management process at local, state and national level.
- At the state level, independent department of Architecture headed by the position of Chief Architect, duly supported by supporting staff should be created. Department of Architecture should be made independent of the Engineering/PWD Departments.
- At the district level, along with the sanctioned cadre of DC, SSP, Revenue etc, post of Architect should be made integral part of district administration for rendering architectural services at the district level.
- Cadre of architecture should also be made integral part of urban local bodies by appointing architects in all the ULBs to make city development rational.
- Architects and Engineers should be ranked in parity both in status and emoluments without any discrimination.
- All architects registered under the Indian Architect Act, 1972 must be mandated to undergo training/ learning periodically to make them updated in the domain of new/ emerging innovations and latest design practices, emerging materials/ building technologies globally and locally.

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

- To create forums involving related professionals of Engineering ; building material industry[II; CREDAI; ASHRAE; Indian Institute of Plumbing; Urban Design Institute; Landscaping Institute to synergise their strength and promote the profession.
- To create awareness about the profession among the masses for making them understand the role and importance of Architecture in promoting public interest, society welfare and creating eco-friendly, cost-effective and qualitative built environment.
- Making people understand that architecture is a profession architects are meant to render services on the pattern rendered by like doctors, lawyers, chartered accountants and not doing a business for making money. Services rendered are self- paying in terms of saving made through design and construction.
- Appropriate mechanism needs to be evolved to ensure that architects in practice render quality services and donot indulge in any malpractices
- Mushrooming of Architectural institutions needs to be stopped, in order to eliminate half- baked professionals coming out as graduates.
- Institutions which are indulging in malpractices of teaching- learning should be strictly proceeded against and should be derecognised on priority.
- Intake of students in the architectural institutions needs to be redefined so that only quality students are admitted and not left over in the architecture colleges.
- Strategies needs to be evolved for taking out Profession and education of architecture from the shadow of engineering for making it grow as an independent profession
- White papers need to be brought out on priority on the state of Architectural practice and teaching- learning so as to understand their status issues/challenges facing them for evolving appropriate options.
- Technology needs to be embedded in architectural practice/ education to promote the quality of profession services rendered/ education imparted- Covid/ no-Covid.
- Promoting architecture in the rural areas which still holds 65% of the Indian Population would be critical. Institutes promoting rural architecture needs creations on selective/ priority basis to create trained manpower in the rural areas. Similarly hill architecture could also remain the area of focus



**Architectural Education—
Opening New Channels for Women in India**

Architectural Education-- Opening New Channels for Women in India

ABSTRACT

Globally, architecture is fast emerging as a profession with ever widening acceptability. Architecture remains a multidisciplinary and versatile profession, which makes optimum use of the latent creativity of an individual, so as to understand and appreciate the aesthetics, functionality and techniques involved in the creation of state of art built environment. Architecture, as a profession, offers numerous opportunities to young professionals, to achieve success and satisfaction in life (Evens,1995).. Profession and academics are known to have high degree of connectivity. The most vital component of architectural education remains its potential, which is infinite in scope, intent and content. With large number of women opting for architecture as a profession , paper makes an attempt to bring out the opportunities that architectural education offers to women and her empowerment in India.

INTRODUCTION

Architecture is a multidisciplinary and versatile field, which awakens and gives impetus to the latent creativity of an individual so as to appreciate and understand the aesthetics, functionality and techniques involved in the making of a quality built creation. Sharing the same platform, it also gives an understanding of the subtleties of the socio-economic dynamism of the complex urban development. Architecture, as a profession, is known for its capacity to infuse philosophies that can promote art of living (Hughes F, 1996). Architecture as a profession today offers a numerous opportunities to today's youth to achieve success and satisfaction in life. Architecture requires a team of specialised professionals, with architects usually operating like a team leader. Architect through his immense creativity and technological skills, has the potential, capacity and capability to amalgamate environment, sustainability and cyber technology, while creating sustainable design options for any building. [RIBA 2003. Architecture is known to be largely a highly satisfactory and noble profession, always contributing to the development of Nation, promoting safety of environment and ensuring dignity of the professionals involved.

Looking at the context of involvement of women in the architecture, it has been found that the number of women involved in the profession and the academia, remains limited.. Majority of famous and celebrated architects that are mentioned in the history of architecture for students of architecture to study are male .July, 2012, by madhavi desa[11]. Very few women are known to occupy the exalted positions of the heads of departments or principals in offices and institutions imparting architectural education . Women are far and few in number to find representation in national level architectural competitions juries, lecture series, as chief guests, on interview panels or on college inspection visits (Ramdorai S, 2012). etc. But new ventures in architecture are inspiring the women architects to reach at par with men and participate equally in these parameters.

WHERE WOMEN STUDENTS STAND IN SOCIETY

After independence the general view was that woman are primarily and essentially meant to look after the household as well as children and their participate in the outer world is secondary[channa karuna, a 20117]. Even today the society stands the same. 'Though higher education is socially accepted and taken for granted among the upper and middle strata in urban India, it is also viewed more as an investment in the daughters' distant future rather than as an immediate goal'[Ramodori s.12].

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

Architecture as a profession and education is in no different and is known to follow the same phenomenon led by similar attitude in the Indian society. Women students have to work and learn under large number of undefined restrictions (Desai M, 2012) due to their social conditions and conventional mindset of an Indian family. They are invariably lost between disparity they face while they experience the social freedom in the 'liberated' architecture college environment and the realities of the outside world [Desai.M.201211]. It becomes very difficult for a woman student to find a balance in this dual-faced world.

Furthermore, although few parents encourage their female children to acquire higher education, but the view is mostly to find a suitable match, in look out for a supportive wife, socially as well as economically [Chaudhary, 19989]. It remains difficult to acknowledge that women can be a true professional. Also most interestingly, after putting a lot of effort since childhood by herself and her family, it depends upon the people in the future family to decide whether she will continue with her career as professional or not.

HOW CAREER IN ARCHITECTURE CAN HELP

Architecture, as a career option offers enormous opportunities for women professionals. The best part of the architectural profession is that it provides great deal of operational flexibility while working as professional. It allows an opportunity to women to work from home or office and also to manage her family. Architecture, being a masculine, is now being increasingly viewed as 'feminine' profession also. [RIBA, 2003]. Various emerging options available to women architects in the profession have been enumerated below;

- As house mentor, a woman architect can serve as consultant to various firms in the building industry, furniture manufacturers, interiors design etc. [RIBA, 200312].
- Working as an entrepreneur remains a personal taste and choice for the women architects. Apart from working on a variety of projects, women architects can also give employment to many people in the industry including architects, interior designers, draughtsman and manpower involved in construction. [RIBA, 200311].
- Woman architect can also have the option of working with any architectural firm on full time or part time basis on various projects in country or abroad. One will have the liberty of choosing the work profile, since the profession involves office work to field work and public dealing (Desai, 2012) Huges, 1984.
- Women Architects can make a choice to be on the panel of banks, commercial institutions and other offices on permanent basis, as career option (EVANS Gerry, 1994).
- Woman architects can collaborate with builders for their housing, commercial, institutional, religious or many such projects as designers or site consultants (Desai, 2012).
- Woman architect can choose academics as a career option by taking onus of being a part of faculty in institutions imparting architectural education at both degree / diploma levels.
- Working as a valuer, woman architect can also render specialised services to banks or financial institutions..
- Woman architects can specialise in the following areas for further value addition to the professional knowledge and competency:
 - Structural engineers
 - Landscape consultants

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

- Urban designers
- Town planners
- Interior designers
- Conservation architect
- Environmental consultants
- Digital architects
- Product Designer
- Housing
- Administrators
- Project manager
- Transportation planners

RESARCH

Research is another area , which offers most promising and value addition field for women architects to explore and adopt. There remains little awareness about research in architecture in India, but new options can be seen emerging in the near future ,as the government policies and programs are focusing on skilling India, upgrading professional skill and to promote research-oriented education. Promoting professional practice and ensuring quality delivery of education requires a supportive and enabling policies and programs . Woman architects have enormous capacity and capability to promote research and development and usher a new area in the academics and practice of architecture. New Education Policy, 2019, hold great promise for women architects to take up teaching as a profession on large scale and to revolutionise the architectural education. Women, due to their inherent understanding, capacities and capabilities, are best suited for as teachers for promoting quality teaching learning in any profession.

CONCLUSION

Architecture, as a profession, is fast changing in its dynamics and positivity It is now fast emerging as more collaborative, diversified and inclusive profession. In the process, it has opened large number of vistas and options, permitting inter- play of new professions, allowing networking of number of allied professionals. Architecture, as a profession. provides women architects enough liberties and options, to play multiple roles in the profession both as creators and promoters of quality spaces and teaching- learning of architecture. It gives a women immense scope and chance to establish herself as a professional in the true sense of the term, like her male counterpart, making this discipline more democratic , diverse and qualitative.

COUNCIL OF ARCHITECTURE



Council of Architecture

COUNCIL OF ARCHITECTURE

(Statutory authority constituted under the Architects Act, 1972)

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NOTIFICATION

New Delhi, 11th August, 2020

F. No. CA/193/2020/MSAER.—In exercise of the powers conferred by clauses (e), (g), (h) and (j) of subsection (2) of section 45 read with section 21 of the Architects Act, 1972 (20 of 1972), and in supersession of the Council of Architecture (Minimum Standards of Architectural Education) Regulations, 1983, except as respects things done or omitted to be done before such supersession, the Council of Architecture, with the approval of the Central Government, hereby makes the following regulations, namely:-

1. Short Title and Commencement- (1) These regulations may be called the Council of Architecture (Minimum Standards of Architectural Education) Regulations, 2020.

(2) They shall come into force from the 1st day of November, 2020.

2. Definitions- In these regulations, unless the context otherwise requires:-

(a) —Act means the Architects Act, 1972 (20 of 1972);

(b) —Core faculty means full time teaching staff members with valid registration with the Council, appointed by the institution on regular basis.

(c) —Council means of Council of Architecture constituted under section 3 of the Act;

(d) —Executive Committee means the Executive Committee constituted under Section 10 of the Act;

(e) —Faculty means the teaching staff members in the service of the institution; (f) —Institution means a department of University/ college/ school of architecture in India imparting instructions for recognized qualification;

(g) —Recognised qualifications means any qualification in architecture for the time being included in the Schedule appended to the Act or notified under section 15 of Act. 3. Duration of the Architecture Course-

(1) The Architecture course shall be of minimum duration of 5 academic years or 10 semesters of 15 to 18 working weeks (90 work days) each, inclusive of six months or one semester of approximately 16 working weeks of practical training during 8th or 9th Semester, as prescribed in Appendix-A.

(2) The Curriculum structure of the Architecture course shall follow the guidelines as outlined in Appendix-A under the Choice Based Credit System. However, the modes of periodic assessment, end semester and viva voce examinations, weightages and grading system are left to the discretion of the University or Institution.

(3) A candidate shall not be permitted to enroll for the Architectural Design course in a semester unless he has completed the Architectural Design course of the previous semester.

(4) A candidate shall not be permitted to enroll for the tenth semester Architectural Design Thesis or dissertation or project course unless he has successfully completed Practical Training or Internship.

(5) A candidate shall be awarded the degree in Architecture course by the University or Institution for having earned the minimum credits as specified in the curriculum.

(6) The Architecture Course shall be completed in a maximum period of 8 years. However, in special circumstances a candidate may be granted an extra 1 year by the University or Institution to complete the course. This shall be given only once to the candidate and treated as zero year.

(7) In case a candidate is not able to complete the course in the prescribed duration, the University or Institution may provide an exit option for the candidate if he has completed and earned all credits for the first three years of study.

4 Admission to the Architecture degree course-(1) No candidate shall be admitted to architecture course unless he has passed an examination at the end of the 10+2 scheme of examination with at least 50 per cent. aggregate marks in Physics, Chemistry and Mathematics and also at least 50 per cent. marks in aggregate of the 10+2 level examination or passed 10+3 Diploma Examination with Mathematics as compulsory subject with at least 50 per cent. marks in aggregate.

(2) The candidate needs to qualify an Aptitude Test in Architecture conducted by the Council complying with the Admission Norms prescribed in Appendix-D.

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

(3) The institutions shall give weightage of 50 per cent. marks for aptitude tests and 50 per cent. marks in the qualifying examination as provided in sub-regulation (1), in the matter of admissions.

(4) Reservation of seats and relaxation in percentage of marks obtained in the qualifying examination for admission shall be as per the reservation policy of Central Government or the respective State Governments.

5. Intake and Migration – (1) The university or institution shall admit candidates at the first year level as per the intake sanctioned by the Council, subject to a maximum of forty candidates in a class. If candidates are admitted above forty as per sanctioned intake, separate classes shall be organised for each 40 candidates or part thereof.

(2) Migration of a student of any class from one institution to another institution is permitted at the discretion of the institutions involved, subject to the number of students not exceeding the permitted maximum intake in that class in the receiving institution and the same shall be notified by the receiving institution to the Council.

(3) Supernumerary quota of admissions as notified by the Government of India shall be over and above the sanctioned intake. The institutions must create additional physical and academic infrastructural facilities, as may be required, for the same in case such admissions exceed 10 per cent. of the sanctioned intake. Further these candidates need to fulfill the requirement specified in Regulation 4.0.

(4) A unique Student Enrolment Number shall be issued by the Council to a student admitted to Architecture Degree course, upon being notified by the institution, provided all eligibility norms for admission as prescribed by the Council are satisfied.

6. **Courses and periods of studies** (1) The guidelines for the courses and periods of studies shall be as provided in Appendix- A.

(2) The institution shall, as an integral part of architectural education curriculum and as a part of teaching course, arrange for study tours, visits, to places of architectural interest.

7. Professional examination, Standards of proficiency and conditions of admissions, qualification of examiners-

(1) The University or Institution shall conduct the examinations at the end of each semester.

(2) The sessional work shall, as far as possible, be assessed by a Jury or Panel of internal and external examiners.

(3) The weightage of internal marks for various courses of study shall not exceed 50 per cent. of the total marks. Internal Assessment of Sessional work shall be done periodically for all courses during a semester, in addition to the end-of- semester examinations, if any.

(4) The pass percentage shall not be less than 45 per cent. in each subject.

(5) Any examiner shall have a minimum of 5 years teaching / professional experience in a field of study relating to the subject of examination. However, an external examiner for tenth semester Architectural Design Thesis/dissertation/project course shall have a minimum of 10 years teaching/ professional experience. 8. Standards of staff, equipment, accommodation, training and other facilities for Architecture education – (1) The institutions shall maintain a teacher and student ratio of 1:10 including core faculty, faculty from allied disciplines and visiting faculty.

(2) The institutions shall have a minimum number of 12 core faculty members for student strength of 200, apart from faculty from allied disciplines and visiting faculty.

(3) The institutions shall maintain strength of faculty as per the pattern prescribed in Appendix – B.

(4) The institutions shall encourage the faculty members to involve in professional practice including research.

(5) The institutions shall provide facilities as indicated in Appendix-C.

(6) The institutions may encourage exchange of faculty members for academic course.

(7) In a selection Committee as prescribed by any Institution or University for Selection Process of faculty, there shall be one Nominee of the Council, who shall act as full-fledged member of such Selection Committee constituted for the purpose of recruitment and /or promotion of faculty, except for Centrally Funded Technical institutions (CFTIs)

(8) The Academic Calendar to be followed by institutions for the commencement of the Architecture course shall be as published by the Council every year.

9. **Miscellaneous-** (1) The University or Institution shall take necessary steps to curb ragging in its premises and take appropriate action as prescribed by Council in case of any such incident.

(2) The University or Institution shall ensure that women (staff, faculty or students) are protected against sexual harassment at the institution and initiate necessary steps as prescribed by Council.

APPENDIX-A

COURSES, PERIODS OF STUDY AND SUBJECTS OF EXAMINATION UNDER CHOICE BASED CREDIT SYSTEM FOR THE ARCHITECTURE DEGREE COURSE

1. Under the Choice based credit system, which is a student or learner centric system, the courses of study in the Architecture Degree course shall be as under:

(1) Professional Core (PC) Course: A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

(2) Building Sciences and Applied Engineering (BS and AE) Course: A course which informs the Professional core and should compulsorily be studied.

(3) Elective Course: Generally a course which can be chosen from a pool of courses and are of two types:

(i) Professional Elective (PE) which may be very specific or specialised or advanced or supportive to the discipline or subject of study or which provides an extended scope

(ii) Open Elective (OE) which enables an exposure to some other discipline or subject or domain or nurtures the candidate's proficiency or skill

(4) Employability Enhancement Courses (EEC) which may be of two kinds: Employability Enhancement Compulsory Courses (EECC) and Skill Enhancement Courses (SEC) 2. The Weightage in terms of Credits for each of the above in the prescribed curriculum of the institution shall be as follows:

(1) Professional Core Courses (PC) : 50 per cent.

(2) Building Sciences and Applied Engineering (BS and AE) : 20 per cent.

(3) Elective Courses (i) Professional Electives (PE) : 10 per cent. (ii) Open Electives (OE) : 5 per cent.

(4) Professional Ability Enhancement Courses (PAEC)

(i) Professional Ability Enhancement Compulsory Courses (PAECC) : 10 per cent.

(ii) Skill Enhancement Courses (SEC) : 5 per cent. Note:- Where it is not possible to offer Open Electives, Professional Electives may have a weightage of 15 per cent. of the total credits. 3. The suggested list of courses under each of these groups is provided in following Table 1.0

PROFESSIONAL ABILITY ENHANCEMENT COMPULSORY COURSES	
43.	Professional Practice
44.	Internship or Practical Training
45.	Project Management
46.	Dissertation or Seminar or Research Methodology
V. SKILL ENHANCEMENT COURSES	
47.	Communication Skills
48.	Computer Studio
49.	Building Information Modeling
50.	Digital Graphics and Art
51.	Entrepreneurship Skills for Architects
52.	Foreign Language

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

13.	Specifications, Cost Estimation and Budgeting
II. BUILDING SCIENCES AND APPLIED ENGINEERING (BS AND AE)	
14.	Building Materials
15.	Building Construction
16.	Applied Mechanics
17.	Structural Design and Systems
18.	Climatology
19.	Building Services
20.	Surveying and Leveling
21.	Acoustics
22.	Environmental lab
23.	Environmental Science for Architecture
ELECTIVE COURSE (EC)	
The list of electives given below is suggestive and the Institution or University may adopt the electives as found feasible.	
III. PROFESSIONAL ELECTIVE (PE)	
24.	Theory of Design
25.	Vernacular Architecture
26.	Interior Design
27.	Art Appreciation
28.	Art in Architecture
29.	Graphic and Product Design
30.	Contemporary Processes in Architecture
31.	Architectural Journalism
32.	Disaster Mitigation and Management
33.	Green Buildings and Rating Systems
34.	Sustainable Cities and Communities
34A.	Building Performance and Compliance
35.	Architecture of South East Asia
36.	Architectural Design with Steel
37.	Architectural Design with Glass
38.	Furniture Design
39.	Appropriate Building Technologies
40.	Earthquake Resistant Architecture
41.	Architectural Conservation
42.	Building Systems Integration and Management
OPEN ELECTIVE (OE)	
Courses approved by the Institution or University from subjects of study other than Architecture which will add value to the course and enable the overall development of the student	
IV. PROFESSIONAL ABILITY ENHANCEMENT COURSES	

PROFESSIONAL ABILITY ENHANCEMENT COMPULSORY COURSES	
43.	Professional Practice
44.	Internship or Practical Training
45.	Project Management
46.	Dissertation or Seminar or Research Methodology
V. SKILL ENHANCEMENT COURSES	
47.	Communication Skills
48.	Computer Studio
49.	Building Information Modeling
50.	Digital Graphics and Art
51.	Entrepreneurship Skills for Architects
52.	Foreign Language

Notes : The names given to the courses of study are suggestive and institutions may use different nomenclatures. The emphasis on teaching various courses may vary from institution to institution. New courses may be introduced and certain courses given less emphasis depending upon the ideology of the institution and context of the region where the institution is located.

4. The regulations and curriculum of the University or Institution shall:

- (1) Provide flexibility in the teaching or learning system
- (2) Provide for a semester exchange in other Universities or Institutions (national or international) with transfer of credits based on course equivalence, wherever feasible.
- (3) Permit student to enroll for any one online certified course with the prior approval of the University or Institution. Such courses shall be considered equivalent to one Elective course.

5. Teaching and learning methods –

- (1) The contents of the courses as listed in Table shall be taught in an application- oriented manner on a scientific and design basis. The course contents shall be taught and learned in lectures, seminars, labs or workshops, studio exercises and design projects, internships and study tours.
- (2) Lectures are held to teach basic connections and the systemisation of theoretical knowledge and the methodology of scientific work. Specific subjects are presented in a well-structured form, incorporating new research results. The results shall be evaluated through periodic assessment of sessional work or an end semester examination or both.
- (3) In Seminars the contents shall be taught in dialogue and discussion phases between the teacher and the student. The results shall be evaluated through periodic assessment of sessional work and/ or end semester examination or both
- (4) In labs or workshops the contents of the course shall be delivered through hands on work and experiments. The results shall be evaluated through periodic assessment of sessional work or end semester examination or both.
- (5) In studio exercises the teachers shall take the lead to provide tasks and offer guidance for solutions finding. The students shall work either individually or in groups. The results shall be defended through drawings; models and reports and evaluated through periodic assessment and an end semester examination or viva voce.

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

(6) In design studios or construction studios or projects the students contribute to the processing, analysis and the solving of problems of direct professional practice, attended by faculty(s) entitled to conduct the studio and examine. The results shall be defended through drawings; models and reports and evaluated through periodic assessment and finally by a jury or panel.

(7) In Internship the students engage in work in an architectural practice/ government architecture departments and train specifically under architects registered with the Council. The results shall be periodically assessed by the architect under whom they are assigned and defend their portfolio in front of a jury or panel at the end of the internship period.

(8) Study tours shall be part of the course and conducted every year. They help to consolidate course contents by acquainting students not only with professional practice but also the culture and context of a region. Note: These learning and teaching methods are only suggestive and every institution can innovate and engage in a pedagogy based on the strength of the institutions. 6. While calculating credits the following guidelines shall be adopted, namely:-

- (i) 1 lecture period or hour shall have 1 credit;
- (ii) 1 lab/workshop or studio exercises or seminar periods or hours shall have 1 credit and
- (iii) 1 design studio or construction studio or project or thesis period or hour shall have 1 credit. For Practical training total number of credits shall be specified for one semester only.

7. Course work for every Semester except the Internship or practical training semester and Architectural Design Thesis Semester shall preferably have 3 or 4 lecture based courses; 2 labs or seminars or studio exercises courses and 1 Design course.

8. A suggested structure for one semester of the B. Arch course is worked out in the Table 2.0

TABLE 2.0

Type of course	Credits per course	Periods or hours of study per course		No of courses	Total Credits
		Lecture	Studio or lab or workshop/ seminar		
Lecture	3	3	-	3 / 4	9 / 12
Lab/workshop/ studio exercises/ seminar	3	1	4	2	6
Design project	Can vary from 9 in the lower semesters to 15 in the higher semesters	-	Varies from 6 to 10	1	Varies from 9 to 15

Notes:

- (i) All courses of study put together would engage the students for a minimum of 26 periods or hours of study a week and a maximum of 30 periods or hours a week.
- (ii) Every semester shall offer a minimum of 26 credits and a maximum of 30 credits. ‘
- (iii) Credits for the Architectural Design Project or Thesis can vary from 15 to 18.
- (iv) The total number of credits for the B. Arch Degree Course could vary from a minimum of 260 credits to a maximum of 300 credits.
- (v) This structure is suggestive and offers flexibility for the institutions to adopt as feasible.

I. Brief description of the courses listed as Professional Core (PC)

1. BASIC DESIGN AND VISUAL ARTS

The understanding the elements and principles of design as the building blocks of creative design will be facilitated through exercises that will develop originality, expression, skill and creative thinking. The grammar of design and visual composition will be explored through two dimensional compositions and three dimensional models using various media for representation. The objective is to enable the understanding of the relationship between the grammar of design and architecture.

2. ARCHITECTURAL DESIGN

This studio based course synthesises the knowledge gained from other courses and is central to the learning and practice of architecture. This course will engage in using conventional methods and linear processes of design to more exploratory nonlinear methods. The scale and complexity will increase progressively from lower semesters to senior semesters. The range should begin with small single activity or single space projects to large urban design projects.

3. ARCHITECTURAL DESIGN PROJECT OR THESIS

This is culmination of undergraduate studies and hence shall display the capability of the candidate to conceive/ formulate a design project and provide solution, aptly demonstrated through supporting research. The main areas of study and research can include advanced architectural design, including contemporary design processes, urban design including urban-infill, environmental design, conservation and heritage precincts, housing etc. However, the specific thrust should be architectural design of built environment. Preparation of presentation drawings, working drawings, detailed drawings and study model are part of the requirements for submission. Submission of the Architectural Design Thesis Project shall be in the form of drawings, project report, models, slides, CDs and reports.

4. ARCHITECTURAL GRAPHICS AND DRAWING Various mediums and techniques of art for artistic expression; free hand drawing; orthogonal projection of geometrical forms and representation; architectural and building representation through 2 dimensional and three dimensional drawings; measured drawing of building elements and simple building forms; presentation in graphic form all elements of building design; study of shades and shadows, textures, tones, colors etc.; rendering using manual mode as well as digital; hands on working with various mediums and materials.

5. HISTORY OF ARCHITECTURE AND CULTURE Architecture as evolving within specific cultural contexts including a aspects of politics, society, religion, climate; geography and geology, etc. through history both in the Western context as well as in the Indian sub-continent; Development of architectural form with reference to Technology, Style and Character- Examples from every historical style illustrating the same. (This course may be delivered in 4- 5 semesters of the course with specific syllabus for each semester advancing in content progressively through the semesters)

6. PRINCIPLES/THEORY OF ARCHITECTURE Principles and percepts of issues as related to architectural design in theory and practice; Appreciation of architecture with respect to man and his behavior; Nature and Design; Principles of organization on Nature; Ideas and Intent in design - Intuitive, contextual, Iconic, Experiential, Environmental, Energy based, Symbolic, Modular; Ideologies or philosophies from the practice of architecture through contemporary history; design communication through graphics.

7. URBAN DESIGN Urban design as a discipline; Components of a city and their interdependent roles; Determinants of urban form; Evolution of historic urban form.; Theories and illustrations of Urban design and the interpretation of the urban form in different ways and layers; Identity and 'place' making; architectural codes and imageability; contemporary urban issues; sustainable urban design; case studies.

8. HUMAN SETTLEMENTS PLANNING Elements and characteristics of human settlements; origins; determinants and their evolution through the course of history; Settlements as expression of political aspirations; Various planning concepts in urban, rural and regional level development plans in the context of India; Changing scenario in the context of Globalisation.

9. HOUSING Social Housing post WW II ; Issues concerning housing in the Indian Context; Various agencies involved in the production of housing; Factors that influence housing affordability; Various schemes and policies of the government in the housing sector; Standards and guidelines for housing; Housing design typologies and the processes involved in housing project development; Case studies and post occupancy evaluation.

10. LANDSCAPE DESIGN Man and Nature; Landscape traditions; Elements and principles of landscape design; Aspects of outdoor design and site planning in enhancing and improving the quality of building environs, functionally and aesthetically; Site structure relationship; Analytic, artistic and technical aspects of designing open spaces at different scales; Role of Landscape design in sustainability; Overview of ecological balance; Impacts of human activities and the need for environmental protection and landscape conservation.

11. SITE PLANNING Site and its content in architectural creations; Influencing factors which governs the siting of a building or group of buildings in a given site; Topography analysis; Scientific techniques of site analysis-case studies; Methodology of preparing a site analysis diagram and mapping; Codes and building regulations; Site utilities and Infrastructure planning. Integration of Renewable Energy systems as per ECBC.

12. CARPENTRY AND MODEL MAKING WORKSHOP Introduction to various carpentry tools and production of simple joints used in joinery; techniques for preparation of block models using various materials; detailed model of a small project using appropriate materials; exploration with plastic material such as clay, plaster of Paris, etc.

13. SPECIFICATIONS, COST ESTIMATION AND BUDGETING Specifications of various building works as per National Building Code (NBC) and Energy Conservation Building Code (ECBC); Writing specifications for materials and various items of work; Systems of taking out quantities and estimating for all trades involved in construction of medium complexity; preparation of Bill of Quantities (BOQ); Cost estimating for building works (material and labor); valuation report preparation; Budgeting for specific projects.

II. Brief description of the courses listed as Building Sciences and Applied Engineering (BS and AE)

14. BUILDING MATERIALS Properties and behavior of both natural and man-made building materials such as bricks, stones, metals, timber, glass, steel and finishing materials in contemporary buildings; Application of these materials in construction; Effects of sun, rain, wind and other climatic and environmental conditions on various building materials and built environment and the science of design for creating effective human comfort conditions within the built environment. Understanding of parameters like U-factor, R-value, Thermal mass, Solar heat gain coefficient (SHGC), Visible light transmittance (VLT), etc.

(This course may be delivered in 3- 4 semesters of the course with specific syllabus for each semester advancing in content progressively through the semesters)

15. BUILDING CONSTRUCTION Traditional and conventional knowledge systems that enable construction of a complete building; various structural systems and methods of construction and detailing of buildings of medium complexity using natural and manmade materials including foundation, walls, roofs, staircase, joinery and finishes; Technology that informs the construction of contemporary buildings using various structural systems and materials. Evaluation of overall assembly U-factor of different building and construction system for various climatic zones as per Energy Conservation Building Code(ECBC). The course will combine lecture and studio exercises whose results will be in the form drawings and models, culminating in a studio which will translate an architectural design into working drawings which are good for construction either in manual/ digital mode. (This

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

course may be delivered in 6-7 semesters of the course with specific syllabus for each semester advancing in content progressively through the semesters)

16. APPLIED MECHANICS Forces and structural systems; analysis of plane trusses; Properties of Sections; Elastic properties of solids; elastic constants; bending of beams; deflection of beams; theory of columns; Statically indeterminate beams; concepts in analysis of structure

17. STRUCTURAL DESIGN AND SYSTEMS Understanding the structural concepts and behavior of structural elements- load bearing structures, framed structures, composite systems, steel structures- - simple calculations for columns, beams, frames, footings, slabs, walls etc. using various systems and relating the knowledge acquired to architectural design.

18. CLIMATOLOGY Climatology as a science for the study of weather conditions averaged over a period of time; the elements of climate; study of human comfort; design of solar shading devices; Heat flow through building envelopes; Air movement due to natural and built form; Design strategies in different climate zones; vernacular and contemporary responses to climate through case studies; analysis using appropriate software; assessment of appropriateness of various Renewable Energy Systems based on climatic conditions.

19. BUILDING SERVICES Study of and design and detailing for water supply, drainage, sewage disposal, garbage disposal, electrification, illumination, air conditioning, fire hazard protection, acoustical treatment, rainwater harvesting, etc. in buildings and building premises, disaster management systems, intelligent energy conservation systems, electronic security and surveillance systems for buildings, etc.; compliance requirements w.r.t. National Building Code and Energy Conservation Building Code. (This course may be delivered over 3 or 4 semesters with specific syllabus for each semester)

20. SURVEYING AND LEVELING Principles of surveying and leveling, use of various survey and leveling instruments, carrying out surveys of land of medium complexity (field work); preparation of survey plans.

21. ACOUSTICS Science of sound; conditions for good hearing; appropriate materials for sound insulation; approaches in history for acoustic planning; planning for good hearing conditions in auditoriums, classrooms, churches and halls, conference rooms, etc.; analysis using software and simple design exercises; application of codes; case studies

22. ENVIRONMENTAL LAB Lab based course which will involve measurements; documentation and recording; analysis and design using hand held and digital tools and through simulation using appropriate software focusing on areas such as thermal performance of built environment, natural and artificial lighting and ventilation and wind movement; evaluate performance of Renewable Energy Systems, Fenestration, Opaque Construction, etc. as per test standards specified in National Building Code (NBC) and Energy Conservation Building Code (ECBC).

23. ENVIRONMENTAL SCIENCE FOR ARCHITECTURE Natural systems; Complex relationships between the built and natural environments; Impact of pollution on natural and man-made environments; Strategies to transform the built environment to meet the risks of climate change; Biomimicry - the study of natural structures and processes- in helping to solve man-made problems and enabling design; Concepts of urban ecology and landscape urbanism; case studies; integration of Renewable Energy Systems in built environment.

III. Brief description of the courses listed as Professional Electives (PE)

24. THEORY OF DESIGN Understanding design and design in history; Role of the designer in changing society; classification of design; Methodologies, theories and models of the design process; Creativity and techniques to enable creative thinking; creativity in architecture; pattern language and participatory approach to design.

25. VERNACULAR ARCHITECTURE Vernacular architecture as a process and not a product; Determinants of vernacular form; Overview of the various approaches and concepts to the study of vernacular architecture;

Various vernacular architectural forms in the various regions of India; Impact of Colonial rule on the vernacular architecture and settlements in India.

26. INTERIOR DESIGN Vocabulary of interior design; Overview of interior and furniture design and design movements through history; various components of interior space and treatment and finishes; Interior lighting, Interior landscape and furniture. Design based studio exercises on ergonomics, materials and working parameters.

27. ART APPRECIATION Vocabulary and principles of art; Perception and representation; categories of art in terms of media and technique; Appreciating art through the study of art production in the West from the beginnings to the birth of modern art; Context for new directions in art in the late 19th and early 20th century; Art production in India over history; Contemporary Art from India and its appreciation.

28. ART IN ARCHITECTURE Role of art in history of world architecture; Symbiotic relationship of folk art and architecture; application of different art forms in architecture; Visual communication in architecture and way finding; Works of different artists and architects that reflect the inter relationship.

29. GRAPHIC AND PRODUCT DESIGN Graphic design elements, principles and applications; Concept of form and space in product design; Relating Form to Materials and Processes of Manufacture. Use of Computers for Form generation; Creativity techniques; product detailing and manufacture; exploratory mockup models for concept development, refinement and detailing; product design prototyping and advanced manufacturing processes.

30. CONTEMPORARY PROCESSES IN ARCHITECTURE Theories of media and its influence on the perception of space – Virtual Reality – Augmented Reality. An understanding of the various aspects of Digital Architecture and its exploration through emerging phenomena that relies on abstraction of ideas is facilitated. This is done through study the works of contemporary architects who have illustrated the influence of the digital media in evolving architecture.

31. ARCHITECTURAL JOURNALISM Introduction to basic skills relevant to the practice of professional journalism; Fundamentals of writing, Technologies and journals; Contemporary architectural journalism; Code of Ethics and Press Laws; Regional, National and International discussion forums; Public Discourse on the Internet, Mass Media and Public Opinion; Critique on selected pieces of journalism; Introduction to Photojournalism; contributions of photography to the professional practice of architecture; modern photography techniques.

32. DISASTER MITIGATION AND MANAGEMENT Disasters, their significance and types; Relationship between vulnerability, disasters, disaster prevention and risk reduction is understood. Inter- relationship between disasters and development; Disaster Risk Reduction (DRR); Disaster Risk Management in India; Disaster Management Act and Policy; Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster; Disaster Damage Assessment; applications and case studies.

33. GREEN BUILDINGS AND RATING SYSTEMS Passive design considerations; active systems; design for energy efficient building- day lighting and natural ventilation; technologies for alternative sources of energy; Net Zero buildings; software tools for the design of a building and the performance evaluation of a building with respect to energy; Rating systems: IGBC, LEED, GRIHA.

34. SUSTAINABLE CITIES AND COMMUNITIES Introduction to Green concepts; Depleting resources and climate change; Sustainable site selection and development sustainable building materials and technologies; Low impact construction – Bio mimicry, Dimensions of sustainable, sustainable community; case studies of eco- cities/ communities. **34A. BUILDING PERFORMANCE AND COMPLIANCE** Building performance assessment and energy simulation tools, understanding of National Building Code (NBC) and Energy Conservation Building Code (ECBC) of India to provide minimum requirements for energy efficient design and construction of buildings;

various compliance approaches; Building Envelope; Comfort Systems; Lighting systems; Electrical and renewable energy systems.

35. ARCHITECTURE OF SOUTH EAST ASIA Architecture as evolving within specific cultural contexts including aspects of politics, society, religion, climate; geography and geology, etc. through history in the context of South East Asia (Indonesia, Malaysia, Thailand and Cambodia, Sri Lanka); Development of architectural form with reference to Technology, Style and Character illustrated with examples from each country.

36. ARCHITECTURAL DESIGN WITH STEEL To understand the design potential of steel as a material in construction and the inherent structural benefits of the material. To inform the various components of steel as structural and aesthetic design element through various case studies. To familiarise the best practices of steel as a construction material.

37. ARCHITECTURAL DESIGN WITH GLASS This is an Industry based course to provide the students with the latest & recent trends in the use of glass in architecture. The right selection and usage of glass for appropriate purposes is vital in the design of buildings. Therefore, modern concepts on Glass Architecture, Role of Glass in Green design and concepts on considerations for improving the building performance using glass are included.

38. FURNITURE DESIGN Principles and history of furniture design; modern movements and the creation of ergonomic and functional furniture; modular concepts in furniture design, mass production and fabrication; codes and specifications; eco- design.

39. APPROPRIATE BUILDING TECHNOLOGIES Appropriate technologies and cost-effective technologies; technologies as evolved from contexts through the practice of International architects and Indian architects; Systems and techniques developed in research labs, etc.

40. EARTHQUAKE RESISTANT ARCHITECTURE Fundamentals of Earthquake and the basic terminology; Historical experience; Site Planning and Performance of Ground and Buildings; Seismic codes and building configuration; Seismic design and detailing of non-engineered construction; Seismic design and detailing of Reinforced Concrete and steel buildings; Design of non-structural elements; architectural design for Seismic resistance.

41. ARCHITECTURAL CONSERVATION Various issues and practices of Conservation; values and ethics; status of conservation in India and the various agencies involved in the field of conservation worldwide and their policies; various guidelines for the preservation, conservation and restoration of buildings; management of historic sites; study of various charters; character and issues in our heritage towns through case studies; Role of INTACH, UNESCO, ICOMOS and other such Organisation

42. BUILDING SYSTEMS INTEGRATION AND MANAGEMENT System and Sub-systems in buildings, relationship and analysis of sub-systems; Building systems for different building typologies, Optimization and sub-system; Control systems for various buildings services, Types of controllers. Preparation of necessary drawings for installing control systems, Integrated building management system, remote monitoring and management, Home automation, Developments in service control systems. IV. Brief description of the courses listed as Professional Ability Enhancement Compulsory Course (PAECC)

43. PROFESSIONAL PRACTICE The architectural profession and the role of professional bodies and statutory bodies; Code of Conduct and ethics in professional practice and the mandatory provisions of the Architects Act 1972; Building bye-laws, Important legislations which have a bearing on the practice of architecture; Arbitration and other legal aspects; Project Management- tender and contract; Implications of globalisation on professional practice with particular reference to World Trade Organisation and General Agreement on Trade in Services.

44. INTERNSHIP OR PRACTICAL TRAINING Orientation under an architect that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process and to facilitate the understanding of the evolution of an architectural project from design to execution.

45. PROJECT MANAGEMENT Project management concepts–objectives& scope, planning /monitoring and control, scheduling / Quality and cost; Traditional management system; Development of bar chart; Critical Path Method networks- Merits and Demerits; Program Evaluation Review Technique network, theory of probability and statistics; Cost model and cost optimization; resource allocation-resource smoothing, resource leveling; Project Feasibility study, Real estate and regulatory strategies, Facility Programming & Planning, Design management, Engineering Procurement Construction, Testing and commissioning.

46. DISSERTATION / SEMINAR / RESEARCH METHODOLOGY This is research writing in a thrust area in architecture. Methods of analysis should have a scientific basis and thorough investigative research is required from primary and secondary sources- through library research and literature review; documentation, etc. This can be a prelude to the ‘_Architectural Design Thesis’. V. Brief description of the courses listed as Skills Enhancement Courses (SEC)

47. COMMUNICATION SKILLS Communication skills in English through listening, speaking, reading and writing; Listening skills through talks for specific information; Speaking skills with specific reference to prospective/ actual clients, suppliers, business partners and colleagues; Reading particularly, rules and regulations, catalogues, architecture journals and textbooks; writing skills especially writing emails, resumes; statement of purpose, proposals and reports.

48. COMPUTER STUDIO Computer operation principles and image editing through a graphical Composition; Computer aided 2D drafting and 3D Modeling through simple exercises; Rendering of a building to create a photo realistic image.

49. BUILDING INFORMATION MODELING Lab based course to build comprehensive Building Information Models (BIM) using appropriate Digital software and Media; BIM for building energy simulation; BIM for cost estimating, project phasing and administration.

50. DIGITAL GRAPHICS AND ART Lab based course involving video, image and vector editing using editing software; scripting; synchronization of sound with patterns generated; Presentation using voice over and production of CD ROMs.

51. ENTREPRENEURSHIP SKILLS FOR ARCHITECTS Introduction to entrepreneurship; leadership skills and self-motivation; marketing and finance management; starting a small business; future-oriented design principles to increase the design organization’s innovative and competitive qualities; Sustainability; Risk-taking; Job procurement; Employee management; marketing; Social entrepreneurship and its relevance to the practice of architecture.

52. FOREIGN LANGUAGE Course on any foreign language.

GUIDELINES FOR CONDUCT OF

PRACTICAL TRAINING AND ARCHITECTURAL DESIGN THESIS

1. PRACTICAL TRAINING –(1) Practical Training shall be undergone during 8th/ 9thsemester of the Architecture Degree course for a period of six months or one semester in the office of an architect or an organization operating in an allied field of practice or research, duly approved by the institution, under mentorship of an architect having experience of at least 5 years.

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

(2) The practical training shall be supervised and evaluated through periodic assessment by the mentoring architect and end semester examination (viva voce) as part of curricular studies.

(3) Training in Foreign Country shall be done under the Registered Architect of that Country and to be approved and monitored by the Head of the University or Institution.

2. ARCHITECTURAL DESIGN THESIS – (1) The Architectural Design Thesis shall be prepared under the guidance of a core Faculty member.

(2) The University or Institution shall conduct the internal evaluation at stages for the Architectural Design Thesis with the guide as a co-assessor.

(3) A jury comprising of an internal and external examiner and the guide shall conduct the final examination (Viva-voice) of the Architectural Design Thesis. External Examiners shall have minimum 10 years' experience.

(4) Practical Training shall be completed before the commencement of Architectural Design Thesis.

APPENDIX-B

STAFF REQUIREMENT

(Strength of full time-faculty based on sanctioned intake)

A. FULL TIME TEACHING STAFF:

Year	I				II				III				IV				V				Total
	H	P	APr	AP	H	P	APr	AP	H	P	APr	AP	H	P	APr	AP	H	P	APr	AP	
40	1	0	1	1	1	0	1	4	1	0	2	6	1	0	3	8	1	1	3	10	15
80	1	0	1	4	1	0	3	8	1	1	4	12	1	2	5	15	1	2	6	20	29
120	1	0	2	6	1	1	4	11	1	2	6	17	1	3	8	22	1	4	10	28	43

H- Head of Institution; P- Professor; A Pr- Associate Professor; AP- Assistant Professor

Notes:

1. Only candidates registered with Council under the provisions of the Architects Act, 1972 shall be eligible for the core faculty posts subject to minimum qualifications, pay and experience as prescribed in Appendix B.

2. In addition to above, approximately 25 per cent. of the teaching load should be allotted to the Visiting faculty drawn from profession.

3. Full time faculty may be recruited in the allied areas from the field of Engineering, Fine Arts, Humanities, etc. provided that there is a minimum of 12 core full time faculty along with Head for an intake of 40. The faculty from allied areas shall not exceed more than 3 for an intake of 40, 6 for an intake of 80 and 9 for an intake of 120. Further, they should be appointed only at the posts of Associate Professor and Assistant Professor in the cadre ratio of 1:2. The minimum qualifications and experience required for appointment of these faculty shall be as per All India Council for Technical Education (AICTE) or University Grants Commission (UGC) Norms, as the case may be. However, the concerned faculty should have the minimum qualification in the respective field(s) at Bachelor's and/ or Master's level with at least 60 per cent. marks at either level.

4. To maintain teacher and student ratio of 1:10, the institution shall have requisite number of visiting faculty teaching equivalents in addition to Full time teaching staff.

5. One Professor Design Chair for every intake of 40 students can be appointed and shall be counted against Professor Cadre.

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

6. Professor Design Chair and other faculty members appointed on tenure basis cannot be considered as Head of the Institution or Principal or Dean or Head of Department.

7. Upto 50 per cent. of the faculty members other than Professors (excluding Professor Design Chair) can be on tenure basis.

B. NON -TEACHING STAFF

S. No.	Position	Intake									Remarks
		40			80			120			
Year of operation		I	II	III	I	II	III	I	II	III	
1	Librarian	1	1	1	1	1	1	1	1	1	Qualifications As per UGC
2.	Assistant Librarian	-	-	-	-	-	-	-	-	1	Desirable- Qualifications As per UGC
3	Lab / Workshop Technician	-	1	2	-	1	2	1	2	2	Minimum one for computer centre
4	Administrative personnel	1	2	2	2	3	4	3	3	4	
	Accounts personnel	1	1	2	1	1	2	2	3	4	
5	Class IV employees	As required									

C. MINIMUM QUALIFICATIONS, PAY, EXPERIENCE AND STRUCTURE OF CORE FACULTY IN DEGREE LEVEL ARCHITECTURAL INSTITUTIONS

Sl. No.	Designation of Teaching Faculty	Pay Level in Paymatrix	Qualifications and Experience
1.	Assistant Professor	Level 10 Rs.57700-Rs.182400 in Paymatrix	Bachelor's Degree in Architecture or equivalent to B. Arch. with minimum 60 per cent. marks and three years of relevant professional experience. OR Bachelor's Degree in Architecture or equivalent to B. Arch. and Master's Degree in Architecture or in allied subjects of Architecture with minimum 60 per cent. marks at either level and one year of relevant professional experience.
2.	Associate Professor	Level 13A Rs.131400-Rs.217100 in Paymatrix	Bachelor's Degree in Architecture or equivalent to B. Arch. and Master's Degree in Architecture or in allied subjects of Architecture with minimum 60 per cent. marks at either level, and Eight years experience in teaching/ research/ professional work out of which a full-time teaching experience of minimum three years Or Thirteen years of professional experience.
3.	Professor	Level 14 Rs.144200 -Rs. 218200 in Pay matrix	Bachelor's Degree in Architecture or equivalent to B. Arch and Master's Degree in Architecture or in allied subjects of Architecture with minimum 60 per cent. marks at either level, and

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

			Fourteen years experience in teaching/ research/ professional work out of which a full-time teaching experience of minimum five years Or Nineteen years of professional experience. Desirable: Ph.D. in Architecture.
4.	Principal/ Director/HOD	Level 14 Rs.144200 -Rs.218200 in Paymatrix	Bachelor's Degree in Architecture or equivalent to B. Arch and Master's Degree in Architecture or in allied subjects of Architecture with minimum 60 per cent. marks at either level, and Seventeen years' experience in teaching/ research/ professional work out of which a full-time teaching experience of minimum eight years Or Twenty years of professional experience. Desirable: Ph.D. in Architecture. Experience in Administration at a responsible position.
5.	Professor (Design Chair) Institution may appoint one Professor (Design Chair) per intake of 40 students, strictly on tenure basis		Bachelor's Degree in Architecture or equivalent to B.Arch. and twenty five years professional experience of commendable, acknowledged and published professional work.

1. Note :

1. It is advisable that approximately 25 per cent. of the teaching load should be allotted to the visiting faculty so that the students are brought in closer contact with the persons actively engaged in practice.

2. Each University or Institution may have a staff structure (faculty) consisting of the following, namely:- Principal/ Director and Professors, Associate Professor and Assistant Professors in the ratio of 1:2:6.

3. The University or Institutions may recruit faculty in the field of Engineering, Qty. Surveying, Art/ Humanities depending on the actual requirements against the total sanctioned strength. However, the faculty should have the minimum qualification in the respective field at Bachelor and/ or Master's level with at least 60 per cent. marks at either level.

4. The equivalent qualification shall mean any such qualification as recognised by the Council for registration as an Architect under section 25 of the Architects Act, 1972.

5. The University or Institution may appoint Professor (Design chair) on tenure basis

Explanations –

(1) Experience shall mean professional experience and/or Teaching and/or Research in the field of Architecture, counted from the date of registration with Council for core faculty or valid equivalent certification from concerned authorities. Professional experience shall be substantiated by Experience certificates from employers, Work orders, Completion certificates and Sample Drawings of the projects undertaken, as the case may be.

(2) Full time faculty means a registered architect, who has put up full time service as a faculty member with the University or institutions approved by Council, either on regular (Permanent) or tenure basis (full time).

(3) The Post Graduate degree or diploma courses in various areas of specialisation in Architecture or its allied fields, with minimum duration of Two year/Four Semester (Full-Time) or Three years/ Six Semester (PartTime),

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

awarded by Indian Universities or competent authorities recognized by Central Government and granted equivalence by any competent authority of the Central Government to M. Arch. degree awarded by Indian Universities, shall be valid for the purposes of appointment in the University or Institutions imparting Architectural education. All Architects possessing Post Graduate Degree or Diploma awarded by Authorities outside India shall be required to produce certificate of equivalence to that of Master's Degree in Architecture or Allied fields granted by competent authority of the Central Government, in order to be considered for appointment as faculty.

(4) Undergraduate qualifications acquired through self-study or non-formal mode though acceptable for purpose of Registration shall not be considered as equivalent Qualification for recruitment as faculty. The candidate must have acquired the recognized qualification through formal mode at undergraduate or Post-Graduate level.

(5) Ph.D. shall be Doctorate conferred by recognised Indian Universities or Institution(s) on any topic related to various subjects related to Architecture or its allied fields. Ph.D. awarded by universities or Institution(s) outside India shall be considered equivalent only after such certification from Association of Indian Universities and/or any other competent authority of the Central or State Government.

(6) Published Professional Work shall mean publication of Professional Work by candidate in any journal(s) or reputed magazine(s) related to design or architecture or its allied fields.

2. Other Notes:

(1) Only candidates registered with Council under the provisions of the Architects Act, 1972 shall be eligible for the posts of core faculty.

(2) All the qualifications appearing in the schedule of qualifications under section 14 or notified under 15 of the Architects Act 1972 shall be considered at par with Bachelor's Degree in Architecture for the purpose of recruitment as faculty member.

(3) (i) Each University or Institution shall have minimum staff of 20 faculty members for an intake of 40, including the Principal / Head of Department. The staff structure prescribed by the Council for an intake of 40 shall be 15 full time faculty with minimum 12 core faculty including the Principal or Head, 3 faculty from allied areas and 5 visiting faculty teaching equivalents. The cadre ratio for full time faculty shall be Principal (Professor Cadre) – 1, Professors- 1, Associate Professors- 3 and Assistant Professors – 10.

(ii) Each University or institution may have one position of full time Professor (Design Chair) for every intake of 40 and may be counted against the Professor Cadre provided one Full-time Professor is already appointed.

(iii) For intake more than 40, proportionate increase in the above posts shall be made as outlined in Appendix- B

(iv) The full- time faculty in allied areas shall be governed by norms prescribed by the All India Council for Technical Education (AICTE)/ University Grants Commission (UGC) or as prescribed under the relevant Central Acts, respectively for employment and up gradation

(v) Of these full- time faculty members, minimum 50 per cent. must be on permanent posts or regular appointments and rest may be on tenure/ contract basis (full time). However, Principal or Head of Institution shall be a regular (permanent) Employee.

(vi) 12 hours or periods of contact within the working week is considered as one teaching equivalent for visiting faculty.

(4) If a grade point system is adopted the CGPA will be converted into equivalent marks as given in the table E6 of the notification no. 1-65/NEC/98-99, March 15, 2000 (Degree level – Government institutions) and May 3, 2000 (Degree level – Self-financing institutions)

Grade point	Percentage of Marks
6.25	55
6.75	60
7.25	65
7.75	70
8.25	75

Note: - For converting the marks into CGPA, following formula may be followed: (Percentage of Marks / 10) + 0.75

(5) All full time, regular faculty members must be paid the remuneration/ salary prescribed by University Grants Commission or such other Government body, in force at the time of appointment and duly revised from time to time.

(6) To recognise the services rendered by senior faculty members who do not fit into above requirements and are already in full-time employment at the same Institution for 15 years, the requirement of qualifications may be relaxed only once in the career for promotion to higher post.

(7) All faculty members must be encouraged to actively pursue practice or research without neglecting their duties towards Institution or students and with due permission from the University or Institution.

(8) Service conditions of affiliating university and respective government for faculty members shall be applicable to all full-time permanent faculty members.

(9) The Retirement Age including Superannuation for Teaching posts of Assistant Professor, Associate Professors and Professors, including Professor (Design Chair) shall be 65 years or as stipulated by the Central Government or State Government from time to time. Re-employment after superannuation shall be permissible against sanctioned vacancies and the faculty may continue to serve, at the discretion of the concerned University or Institution, until the age of 70 but shall not hold an administrative position.

(10) All faculty members shall be required to undergo three months 'faculty training course conducted by Council before completion of their probation period. The training period shall be treated as part of service of the concerned faculty in the concerned University or Institution.

COUNCIL OF ARCHITECTURE
(INCORPORATED UNDER THE ARCHITECTURE ACT ,1972)

**MINIMUM STANDARD OF
ARCHITECTURAL EDUCATION
REGULATION 1983**

In exercise of the power conferred by clauses (e),(g),(h)and (j) of sub-section (2) of section 21 of the architects act 1972 (20 of 1972) the council of Architecture , with the approval of the Central Government , hereby makes the following regulations , namely

1 . Short Title and Commencement

(1) These regulations may be called the Council of Architecture (Minimum Standards of Architectural Education) Regulations , 1983 ,

(2) They shall come into force on the date of their publication in the Official Gazette

2 . Definitions

In these regulations , unless the context otherwise requires

(a) " Acr means the Architects Act , 1972 (20 of 1972)

(b) Council " means of Council of Architecture constituted under Section 3

(c) " Executive Committee " means the Executive Committee constituted under Section 3

(d) " Faculty means the full - time teaching staff members in the service of the Institution ;

(e) Institutions means the colleges / departments / schools of architecture in India imparting instructions for recognized qualifications :

(f) " Recognised qualifications means any qualification in architecture for the time being included in the Schedule or notified under section 15 of Act .

3. Duration and Stages of the Course

(1) The architecture course shall be of minimum duration of 5 academic years or 10 semesters of approximately 16 working weeks each inclusive of six months / one semester of approximately 16 working weeks of practical training after the first stage in a professional office .

(2) The architecture course may be conducted in two stages.

(3) The first 3 academic years / 6 semesters of approximately 16 working weeks each of the course shall be a basic standard course and shall be the first stage provided that candidates are admitted to the course shall complete the first stage within 5 years of admission to the course.

(4) The second stage of the course shall be of 2 academic years / 4 semesters of approximately 16 working weeks each

(5) The completion of first stage shall not qualify candidates for registration under the Architects Act, 1972.

4 Admission to the Architecture Course

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

(1) No candidate, with less than 50% marks in aggregate, shall be admitted to the architecture course unless he / she has passed an examination at the end of the new 10 + 2 scheme of Senior School Certificate Examination or equivalent with Mathematics as a subject of examinations at the 10 + 2 level.

(2) Where 10-2 scheme is not introduced, candidates must have passed after 11 years schooling the Higher Secondary pro - university pre - engineering or equivalent examinations in the Science group of any recognized University of Board with English, Physics, Chemistry and Mathematics as compulsory subjects.

(3) The Institutions may subject the candidates, seeking admission to the architecture course, to aptitude tests specially designed to assess the candidates aptitude: Provided that no separate aptitude tests may be conducted where admissions are made through competitive examinations

(4) The Institutions shall not give weightage of more than 50% marks for aptitude tests in the matter of admissions

5. Intake and Migration

(1) The sanctioned intake of candidates at the first year level shall not exceed a maximum of 40 in a class. If more than 40 candidates are admitted, separate classes shall be organized

(2) The institutions may permit, at their discretion, migration of students from one institution to another subject to the maximum number of students not exceeding the permitted maximum intake in a class.

6. Courses and periods of studies

(1) The Institutions imparting instructions in architecture required for granting recognized qualifications may follow the courses and periods of studies as prescribed in Appendix - A.

(2) The institution shall as an integral part of architectural education curriculum and as a part of teaching program, arrange for study tours, visits to places of architectural interests.

7. Professional examination, standards of proficiency and conditions of admissions, qualification of examiners

(1) The University or an independent examining body shall conduct the examinations at the end of each stage.

(2) The sessional work shall, as far as possible, be assessed by a jury of internal and external examiners,

(3) The weightage of marks for subjects having both class work marks as well as examination marks may not exceed the ratio of 50 : 50

(4) The pass percentage shall not be less than 45% in each subject and shall not be less than 50% in the aggregate.

(5) Candidates who have passed in the internal assessment, shall only be allowed to appear in an examination.

(6) An examiner for any of the subjects of examination shall have a minimum of 3 years teaching professional experience in his / her field of study

8. Standards of staff, equipment, accommodation, training and other facilities for technical education

(1) The Institutions shall maintain a teacher / student ratio of 1: 8.

(2) The institutions shall have a minimum number of 12 faculty members for a student strength of 100.

(3) The institution with the maximum intake of 40 in a class may have the faculty pattern as prescribed in Appendix - B.

(4) The institutions shall encourage the faculty members to involve in professional practice including research.

(5) The institutions shall provide facilities as indicated in Appendix - C.

(6) The Institutions shall encourage exchange of faculty members for academic programmes.

Notwithstanding anything contained in these regulations, the institutions may prescribe minimum standards of Architectural Education provided such standards does not in the opinion of the Council, falling below the minimum standards prescribed from time to time by the Council to meet the requirements of the profession and education his.

Courses, Periods of Study and Subjects of Examination
Stage I - Basic Course

Sl No.	Subjects of Examination	Minimum No. of periods of 50 to 60 minutes duration
1.	Architectural Design	600
2.	Building Construction	360
3.	Building Materials and Sciences	60
4.	Architectural Drawing and Graphics	360
5.	History of Architecture	120
6.	Workshop Practice	120
7.	Landscape Design	60
8.	Structural Mechanics and Theory of Structure	300
9.	Surveying and Levelling	60
10.	Building Services & Equipment	90
11.	Humanities	60
12.	Estimating & Costing	60
13.	Principles of Human Settlements	60
		2310

Note:

1. The names given to the subjects of study are suggestive only. The same subjects pertaining to the architecture may be taught under different names. The emphasis on teaching various subjects may vary from institution to institution. New subjects may be introduced and certain subjects given less emphasis depending upon the requirement and educational philosophy of an institution. The subjects of Land scape Design, Humanities and Estimating & Costing may, if desired, be taught in the second stage of the course.

2. For the purpose of calculating the periods of study, 30 periods per week per semester / term of class are considered to be adequate. For 3 years of study at the rate of 16 weeks per semester / term, the total for first stage works out to be 2880 periods.

3. In order to give freedom to the Institutions to orient the Course as per their own philosophy, approx. 75 percent of the total periods of study have been taken into account for calculating the minimum hours of study for each subject while the institutions may allot the balance approx. 25 percent of the study periods to the subjects of the choice. Minimum total contact periods should be 2880. Thus, 570 periods are to be allotted by the institution to the subjects of their choice.

4. Minimum total contact periods should be 2880. Thus,570 periods are allotted by the institution to the subjects of their choice.

Brief description of the subjects listed in the Stage - I of the Course

1.ARCHITECTURAL DESIGN

Applying the knowledge gained in other subjects and to design buildings of medium complexity e ... Schools, Colleges, Dispensaries, Shops and Houses, etc., and present them in graphic form.

2. BUILDING CONSTRUCTION

Knowledge of various methods of building construction of medium complexity with timber, stone, bricks, concrete etc. including foundation, walls, roofs, staircase, joinery and finishes

3. BUILDING MATERIAL AND SCIENCES

Knowledge of basic building materials and their behavior such as bricks, stone, metals, timber and finishing materials. Effects of climate on built environment to be able to design for comfortable conditions 4.

4.ARCHITECTURAL DRAWING AND GRAPHICS

Ability to present in graphic for all elements of design - Study of shades and shadows, textures, tones, colors, geometrical form, perspectives and projections , free hand drawing and rendering,

5. HISTORY of ARCHITECTURE

Study of various styles of architecture and methods of construction through the ages in the world with emphasis on Indian Architecture

6. WORKSHOP PRACTICE

Ability to make building models with various materials such as card - board , wood, plastics, plaster of paris and metals. Ability to make simple joints in timber pipes and other materials

7. LANDSCAPE DESIGN

Understanding of landscape elements like trees, shrubs, plants, water, rocks and development of landscape planning and application in architectural design

8. STRUCTURAL MECHANICS AND THEORY OF STRUCTURES

Understanding the structural concepts and behaviour of structural elements, simple calculations for columns, beams, trusses, slabs, walls in concrete, steel and timber

9.SURVEYING AND LEVELING

Understanding of various survey and leveling instruments, carrying out surveys of land of medium complexity and preparation of survey plans

10. BUILDING SERVICES & EQUIPMENT Study of and designing for water supply, drainage, sewage disposal, electricity supply. wiring and lighting for buildings

11. HUMANITIES

ARCHITECTURE EDUCATION IN INDIA -WAY FORWARD

Study of sociology, economics and culture, as applicable for design of human settlements

12. ESTIMATING AND COSTING

systems of taking out quantities and estimating for all trades involved in construction of medium complexity

13. PRINCIPLES OF HUMAN SETTLEMENTS

Man and environment: Biological and behavioural responses to human settlements; Design for living, natural and built - environment. Ancient texts and treatises on settlement and area planning in India.

Human settlements during ancient medieval and modern periods in India, Europe and other parts of the world. Characteristics of human settlement by Muslims and Hindi rulers in India

Stage-II

Subjects of Examination	Minimum No. of periods of 50 to 60 minutes duration
1. Architectural design, planning and thesis	570
2. Building Construction, Materials and Specifications	210
3. Building Sciences & Services	60
4. Town Planning (Theory)	60
5. Professional Practice	90
6. Building Bye-laws	15
7. Structure System	45
8. Electives such as :	
(i) Housing	60
(ii) Urban Design	
(iii) Interior Design	
(iv) Building Management	
(v) Landscape Design	
(vi) Urban Planning	
1110	

Note:

1. The names given to the subjects of study are suggestive only. The same subjects pertaining to the architecture may be taught under different names. The emphasis on teaching various subjects may vary from institution to institution. New subjects may be introduced and certain subjects given less emphasis depending upon the requirement and educational philosophy of an institution. Teaching in the second stage may be a lot more flexible. Students may obtain employment and may come back to complete the prescribed course later. It may also be possible to complete the second stage of the course as a part time course depending upon the facilities available in an institution

2. for the purpose of calculating the periods of study, 30 periods per week per semester / term of class are considered to be adequate for 19 years of study at the rate of 16 weeks per semester / term, the total for second stage work out to be 1440 hours.
3. In order to give freedom to the institutions to orient their course as per their own philosophy, approx. 75 per cent of the total periods of study have been taken into account for calculating the minimum period of study for each subject while the institutions may allot the balance approx. 25 per cent of the study periods to the subject of their choice
4. Minimum total contact period should be 1440. Thus 360 periods are to be allotted by the institution to the subjects of their choice. 3.

Brief Description of the Subjects Listed in the Stage - II of the Course

1.Architectural Design, Planning and Thesis

Design of complex buildings and campuses involving analytical studies of building and spaces from sociological, economic and cultural points of view such as Universities, Industrial Estates, Housing Schemes etc. Thesis on a subject requiring detailed analytical study to lay down validity and design criteria presented in graphic form, models and report. Thesis may also be on research projects presented as a written report. 2.

2;Building Construction, Materials and Specifications

Study of advanced building construction methods with new materials such as plastics, metals, synthetic boards and latest techniques in the use of concrete.

3.Building Sciences & Services

Study of Acoustics, Air - Conditioning, Heating, Cooling, Mechanical installations, Fire - control, Water supply and Drainage system for complicated buildings.

4. Town Planning (Theory)

A general understanding of town planning principles as they have developed through the ages.

5. Professional Practice The examination in professional practice is designed to assess the knowledge, skill and maturity which fit the architect to fulfil his professional duties and his understanding of the management of an office organization for such a purpose. The syllabi should cover the following areas of study:

General principles of Indian Contract Act; Building Contracts generally, Conditions and forms of contract, Administration of contracts, Principles of arbitration, Indian Arbitration Act, 1940, valuation of properties, Architectural competitions; Easements of properties; Report writing, Codes of Practice; Conditions of Engagement: Duties and responsibilities of an architect in relation to owner, contractor, relate professional and public; Indian Standards & Codes of Practice.

(Planning and Building legislation etc. has been omitted because this is covered under Building Bye - laws - item

6) Building Bye - Laws Study of building regulations to enable to design and prepare drawings for submission to concerned bodies

7. Structure Systems

Study of new structural technology such as space frames, prestressing, shells and understanding of the limitations and scope of these techniques. Calculations for these techniques are not expected.

8.ELECTIVES SUCH AS:

- (a) Housing
- (b) Urban Design
- (c) Interior Design
- (d) Building Management
- (e) Landscape Design

Urban Planning 8. Intensive study of one or more of the subjects offered as elective depending upon the expertise available to an institution. The list of the subjects may be enlarged but they should be related to Architecture.

APPENDIX - B

Statement showing the designation, pay-scale and qualification etc. required to be prescribed for faculty positions

Sl. No.	Designation	Pay-Scale	Qualifications
1.	Lecturer	Rs. 700-40-1100-50-1600	Bachelor's Degree in Architecture or equivalent plus two years of relevant professional experience. OR Master's Degree in Architecture or equivalent and one year's relevant professional experience. * Provided further that if a candidate does not possess a Master's Degree in Architecture and professional experience or a person possessing such experience is not found suitable, the person appointed will be required to obtain the desired professional experience within a period of five years on his appointment failing which he will not be able to earn future increment until he fulfils this requirement.
2.	Reader/Asstt. Professor	Rs. 1200-50-1300-60-1900	B.Arch. or equivalent with 7 years experience in Teaching / Research/ Professional Work. OR M. Arch. Or equivalent with 5 years experience in Teaching/Professional Work.
3.	Professor	Rs 1500-60-1800-100-2000-125/2-2500	B.Arch. or equivalent with 10 years of experience in Teaching/Research Work. Experience of guiding research. OR M. Arch. or equivalent with 8 years of experience in Teaching/Research/ Professional Work.
4.	Principal/Head of Department	Rs. 1500-60-1800-100-2000-125/2-2500 plus special pay	B.Arch. or equivalent with 10 years experience in Teaching/Research/Professional Work. Experience of guiding research. OR M. Arch. Or equivalent with 8 years of experience in Teaching/ Research/ Professional work.
5.	The Institution may appoint Professor of Eminence.		

Note :

1. It is advisable that approx. 25% of the teaching load should be allotted to the visiting faculty so that the students are brought in closer contact with the persons actively engaged in practice.
2. Each institution may have a staff structure consisting of the following : Principal or Head of Department and Professors, Asstt. Professors/Readers and Lecturers in the ratio of 1:2:4.
3. The Institutions may recruit qualified persons in the field of Engineering/Qty. Surveying/Art/Humanities depending on the actual requirements against the total sanctioned strength.

4. The equivalent qualification shall mean any such qualification as recognised by the Council of Architecture for registration as an Architect under section 25 of the Architects Act, 1972.

APPENDIX - C

Physical Facilities The Institution of Architecture should be located in a building to have a floor area of about 15 sq.m.m. per student. The building should include class rooms and at least 5 studios, adequate space for faculty members, library, workshop, materials museum, laboratories, exhibition/conference room, office accommodation and common area for students and staff. The space requirements per student for architectural education whether in the Institution or in the Hostel are apt to be more than for most other types of professional courses like engineering and medicine because of the large space required for preparation of drawings. This factor should be borne in mind in the design of Hostels and Studios.

Facilities may also be provided for extra-curricular activities and sports.

The equipment in the workshop/laboratories has also to be provided to meet with the special requirement for architectural education. It is desirable to provide locker facilities in the studios for students.

The Library, Workshops, Laboratories and Photography unit should be managed by professionally qualified staff with adequate supporting staff to assist the students and faculty members in their academic programmes. There should also be administrative supporting staff to run the Architectural Institutions.

It is desirable to provide hostel accommodation and residential accommodation for staff and students in close proximity of the institution.

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