

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

FACULTY OF ARCHITECTURE

BACHELOR OF ARCHITECTURE

SEMESTER - VII

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESSMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	NAR - 701	PRACTICAL TRAINING - I	-	-	-	-	-	250	-	250	250	500	16	
		TOTAL										500		
		GENERAL PROFICIENCY										0		
		GRAND TOTAL										500		

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

FACULTY OF ARCHITECTURE

BACHELOR OF ARCHITECTURE

SEMESTER - VIII

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	NAR - 801	ARCHITECTURAL DESIGN - VII	1	0	8	30	70	100	75	25	100	200	9	6+6+6 HRS.
2	NAR - 802	CONSTRUCTION & MATERIALS - VII	2	0	4	25	50	75	50	25	75	150	6	3 HRS.
3	NAR - 803	ADVANCED STRUCTURES	1	1	0	15	35	50	50	0	50	100	2	3 HRS.
4	NAR - 804	TOWN PLANNING	1	2	0	15	35	50	50	0	50	100	3	3 HRS.
5	NAR - 805	ELECTIVE - I	1	2	0	15	35	50	50	0	50	100	3	3 HRS.
6	NAR - 806	ADVANCED SERVICES	1	1	0	15	35	50	50	0	50	100	2	3 HRS.
7	NAR - 807	PROFESSIONAL PRACTICE - I	2	1	0	15	35	50	50	0	50	100	3	3 HRS.
8	NAR - 808	DISSERTATION	0	5	0	-	-	50	-	-	50	100	5	
		TOTAL	9	12	12							950	33	
		GENERAL PROFICIENCY										50		
		GRAND TOTAL										1000	33	

**B. ARCH. SEMESTER – VII
NAR – 701, PRACTICAL TRAINING - I**

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESSMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
-	-	-	-	-	250	-	250	250	500	16	-

INTRODUCTION

A. TRAINING RULES:

Extracts from Ordinances, Scheme of Examination & Syllabus:

(For the award of the degree of B. Architecture by the Dr. A.P.J. Abdul Kalam Technical University, Lucknow)

Ordinance 16 PRACTICAL TRAINING:

- 16.1 Each student will be required to proceed on 'Practical Training' for the VII semester after appearing at the VI semester examination. The Principal/Head of Department of Architecture of the concerned Institute will approve the office of the 'Practical-Training' for the student.
- 16.2 The marks for 'Practical Training' will be awarded to each student in accordance with the Regulations and Guidelines issued separately by the Dr. A.P.J. Abdul Kalam Technical University.

B. AIMS OF PRACTICAL TRAINING:

1. The aim of the 'Practical Training' is to enable the students to gain the kind and range of practical experience which will prepare them for their likely responsibilities, immediately after qualifying B. Arch. Course.
2. The 'Practical Training' should be regarded as an important academic activity. Howsoever good the arrangement of training may be, the trainee student, still, has the responsibility to use his own initiative in making the best use of the opportunities which he/she gets during training period and prepare himself/herself for the profession.
3. The student should try to seek a variety of experiences in his/her 'Training office' to acquaint himself/herself with various works, procedures etc. of building trade.

GUIDELINES FOR STUDENT TRAINEE

1. Criteria for selection of a Training Office

- In case of proprietorship firm, the proprietor shall be an architect; also, the firm shall have at least two or more architects as employee/associates.
- In case of 'Partnership' / 'Pvt. Ltd.' Firms, at least one of the partner/director shall be an architect, and the firm shall have at least one or more architects as Partner/director/employee/ associate.
- In case of a 'Public-sector' / 'State or Central Government office/academic institute or a multinational organization', there shall be a separate wing for architectural consultancy works.
- The said architect (Proprietor/Partner/Director/Head of Department/Chief Architect etc.) shall have at least 10 years of working experience and the organization should have a variety of projects.

2. Working Relationship between Architect and Trainee

- The architect shall provide enough jobs to the trainee to keep him/her occupied.
- The Architect shall expose the trainee to difference aspects of professional practice. The tasks given to the trainee shall include the following-
 - **Preparation of**
 - Sketch designs, presentation drawings etc.
 - Municipal drawings according to the byelaws.
 - Workings drawings and details.

- Estimates, bill of quantities & specifications.
- **Discussions with**
 - Clients.
 - Structural Consultants.
 - Services Consultants.
- **Inspection and management of site.**
- **Preparation of**
 - Models, perspectives and photographs.
 - Reports, progress charts etc.
- **Other administrative works.**

3. Honorarium/Stipend

- The architects usually pay some amount as honorarium/stipend to meet out of pocket expenditure to the trainee. The Institute/College of the student shall have no objection if the trainees accept/receive such honorarium/stipend.
- The mode and amount of the honorarium shall depend upon the office and be based upon a mutual agreement between the employing architect and the trainee. However it shall neither be a claim of the trainee nor binding on the architect but in order of professionalism and to maintain the dignity of profession, the training office of architects pay a respectable amount as stipend/honorarium.
- The Institute/Training and Placement cell of the Institute shall not in any way be responsible for the payment against any sorts of damages, whatsoever.

4. Code of conduct for the trainee

- He/she shall abide by the rules, regulations and general instructions of the office/firm.
- He/she shall remain punctual and regular in attendance.
- He/she shall make all efforts to learn the work involved in the profession, and if so required for work, shall attend the office beyond the scheduled time in the office.
- He/she shall respect and obey the senior members of the office/firm.
- He/she shall take up the job with full responsibility and show utmost interest in the work allotted.
- He/she shall inform the institute/training and placement cell about joining in the training office, its address and contact numbers. He/she shall also inform the address of the accommodation acquired during the training period.
- He/she shall remain in regular touch with the institute/ 'Training and Placement Cell' and shall keep the Training and Placement Cell fully informed about his/her progress in the training office.
- In case of any complaint or misconduct, the Institute/Training and Placement Cell may take suitable and strict action against the student

5. Arranging/Fixing-up the Training office

- The Department of Architecture, directly or through the 'Training and Placement Cell' of the Institute shall provide a list of offices, along with their addresses of some well-established and recognized architects. Addition, alteration and deletion in such a list may be made from time to time in conformity to 'Criteria' as laid down for selection of a training office.
- After seeking advice from 'Training and Placement Cell', the student shall make his/her options available to the Training and Placement Cell.
- With the help of 'Training and Placement Cell', the student shall make all efforts to settle his/her appointment as trainee with an established and recognized architect.

6. Joining and Leaving the Training Office

- The trainee is expected to join the training office on the scheduled date, and submit his '**Joining Report**' on the letterhead of the office duly signed by Head of the Training to the Institute in the Performa prescribed for the purpose and contained in the Log Book.
- The trainee must obtain a '**No Dues Certificate**' duly and get relived from the office at the end of the training period or before changing the 'Training Office'. The trainee must submit this '**No Dues Certificate**' along with the **Log Book**.

7. Change of Training Office

- In case of any emergency, a trainee may be permitted to change the training office/place of training once only during the entire period of training. He/she shall inform the Principal/Director/Head of

Department/Officer in-charge of the 'Training and Placement Cell', and seek prior permission for such a change.

- The total duration of the practical training shall be the sum of the period of stay in different offices. It shall be in conformity with the 'Duration of Training' as prescribed in the 'Ordinances, Scheme of Examination & Syllabus' of the Dr. A.P.J. Abdul Kalam Technical University.

8. Final Submissions

- After completion of practical training, the trainee is required to submit the following to the parent Institute.
- 'Certificate' of successful completion of the practical training mentioning the attendance in percentage, from the architect.
- 'Daily Diary' with details of the day to day work record, which will be returned to the student after assessment and viva voce examination. The suggested 'Proforma' of the page of the daily diary is available in the prescribed 'Log-Book'.
- 'Training report' supplemented with the prints and documents of work done during practical training. The prints and documents shall be obtained with the permission of the Training office and shall be duly signed by the 'Supervisor'.
- Training report shall be submitted in two copies. First copy shall be returned to the student after assessment of sessional marks and viva voce examination. The second copy shall be retained by the Training and Placement Cell/library. These shall be presented in A-4 size with ring binding.

9. Failures:

- In case the student/trainee remains unsuccessful or fails in completing his/her practical training or viva-voce examination, the matter shall be dealt with in accordance with the relevant 'Rules and Regulations' of the Dr. A.P.J. Abdul Kalam Technical University.

COMPOSITION OF JURY PANEL FOR FINAL EVALUATION / EXAMINATION OF PRACTICAL TRAINING EXAMINERS -

- An Architect Director / Dean / Principal / Head of the Department / Professor of the parent institution.
 - An Architect Director / Principal / Head of the Department / Professor of other than the parent institution.
 - An Eminent Architect from the profession with at least 15 years of field experience.
- Further the Practical Training Coordinator will act as facilitator.

B. ARCH. SEMESTER – VIII
NAR – 801, ARCHITECTURAL DESIGN - VII

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	8	30	70	100	75	25	100	200	9	6+6+6 HRS.

OBJECTIVES

- Understanding design as a process of problem identification, space standards, formulation of requirements, evolution of design criteria and development of design of buildings in urban context, phasing and development.
- Understanding relationship of buildings amongst themselves and with a given environment.
- Incorporating the agenda of complex services, acoustics, building bye laws, structure, site planning and landscape.

Module-1	Introduction	Understanding the importance of ‘context’ and built urban environment in design and lessons to be learnt in contextual insertions.
Module-2	Study and Analysis	Examining an existing urban environment for establishing parameters that influence contextual insertion within that fabric.
Module-3	Design Proposal	Design of a multi-utility building/campus incorporating the constraints derived from the context it is placed in.
Module-4	Integration of Services and Structure	Development and refinement of the design proposal to the stage integrating services, structure and other infrastructural facilities necessary for the final execution of the project and making relevant drawing for the same .

SUGGESTED STUDIO EXERCISES

1. Study of a given urban fabric with underlying context.
2. Insertion of built forms like commercial complexes, interpretation centres & malls.
3. The exercises shall be generated after understanding the existing physical, socio-cultural, economical and political context surrounding activities etc.

REFERENCE BOOKS

1. Architecture Today
2. Concept to the manifest

B. ARCH. SEMESTER – VIII
NAR – 802, CONSTRUCTION & MATERIALS – VII

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	0	4	25	50	75	50	25	75	150	6	3 HRS.

OBJECTIVES

- To introduce and familiarize the students with advanced and speedy building techniques.
- The understanding for the system to be adopted for the construction of large span & multi storey structures.
- To introduce and familiarize the students with the various construction equipments required for speedy and effective construction works.
- To study the causes and remedies of various defects in existing and new construction.
- To familiarize the student with the advanced building construction practices on site.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1	Advanced Structural Concretes	Structural Light weight Concrete, High Strength Concrete-Classification, Availability, Characteristics and Uses.
Module-2	Materials for pre-stressing	Classification, Availability, Characteristics and Uses.
Module-3	Forms & materials for speedy construction	Reinforcement types, RMC; Advanced Formwork systems. Classification, Availability, Characteristics and Uses.
Module-4	Forms of steel for Industrial construction	Classification, Availability, Characteristics and Uses.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit factory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-5	Workshop/Construction Yard Practice	Practicing in construction yard by making the examples of precast components.
Module-6	Site Exposure	Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in Precast works.
2. To construct examples of precast works in construction yard.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-1	Prefabrication	Systems – open prefab system, large panel prefab system, joints, pre-casting methods, materials, on-site and off-site prefabrication, components, etc.
Module-2	Pre-stressed Concrete	Introduction, methods of pre-stressing and their application to large-space structures.
Module-3	Speedy Construction	Methods, Types of floor construction - Beam & Slab, Waffle Grid Slab, Drop Beam & Slab, Flush Slab, Lift Slab Construction; Cast-in-situ service & stair cores; Cross wall & Box frame construction.
Module-4	Industrial Construction	Structural Steel Works: Portal Frame Construction, north-light truss and lattice girder roof with various roof coverings.

Module-5	Defects and Remedies	The study of various defects in buildings and their remedies, Defects caused by dampness, applied forces and changes in size.
Module-6	Modular Coordination	Aims, basis, planning, dimensioning. Assembly of components, tolerances, modules, reference system, grids, positioning of functional elements – slabs, walls, staircases; Standardization in buildings' design and their components.

CONSTRUCTION PLATES

1. To understand the joint details in prefabricated buildings.
2. To understand the application of pre-stressed concrete in buildings – planks, hollow core slabs, single & double tee slabs; beams, columns; composite construction.
3. To understand speedy construction techniques in buildings.
4. To understand large span structural steel works with roof coverings.
5. To understand the causes and remedies of various defects in existing and new construction.
6. To understand the standardization in buildings' design and their components.

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Building Construction-Bindra & Arora.
8. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
9. Mitchell's Structure & Fabric-II
10. Prestressed Concrete Structures: P. Dayaratnam
11. Concrete: Microstructure, Properties and Materials P. Kumar Mehta
12. Properties of Concrete A. M. Neville
13. Concrete Admixture Handbook: Properties, Science & V. S. Ramchandran Technology
14. Modern Prestressed Concrete: J. R. Libby
15. Principle & Practices of Heavy Construction: Smith & Andres
16. Don A. Watson, Construction Materials and Processes, McGraw Hill Co.
17. Building Materials by SC Rangwala: Charotar Pub. House, Anand
18. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
19. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
20. National Building Code of India (Latest Edition), Bureau of Indian Standards.
21. Engineering Materials-Deshpande.
22. Engineering Material-Roy Chowdary
23. Designing with models – Criss. B. Mills.
24. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.
25. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth, 2000.
26. Raghuwanshi, B.S., "A Course in Workshop Technology - Vol. I and II", Dhanpat Rai and Co, 2001.
27. Wenninger (Magrus.J.) Spherical Models, Cambridge University Press, 1979
28. Testing of Concrete in Structures J H Bungey and S. G. Millard
29. Non-destructive testing V. M. Malhotra
30. Learning from failure – deficiencies in Design, Construction and Service R N Raikar
31. Concrete: Repair and Maintenance Illustrated, Problem Analysis, Repair strategy and Techniques Peter Emons & Gajanan Sabnis
32. Construction Failure Jacob Feld, Kenneth Harper

B. ARCH. SEMESTER – VIII
NAR – 803, ADVANCED STRUCTURES

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	50	50	0	50	100	2	3 HRS.

OBJECTIVES

- To understand the reinforcement cement concrete design of structural elements

Module-1	Analysis and design of Pre stressed concrete	Introduction, Element of pre stressed concrete, Advantages and disadvantages of prestressed concrete, Reinforced concrete versus prestressed concrete, General Principles of prestressing concrete member and Systems of prestressing, Loss of prestress. Analysis and design of prestress concrete beam.
Module-2	Multistoried buildings	Introduction, Structural systems, Stiffening elements, Need for redundancy, Regularity, Member stiffness, Loads (Dead loads, Live loads, Wind loads), Approximate analysis for vertical loads and lateral loads, Effect of sequence of construction, Partition walls or infill walls, Coupling effect in buildings, Effect of joint width, Beam to column joint. Introduction to various loads resisting system.
Module-3	Analysis & Design of Portal frame (R.C.C.)	Analysis and design of portal frame (Single bay, Single storey) with fixed and hinged base, in R.C.C.
Module-4	Analysis & Design of Shell structures (R.C.C.)	Introduction to various types of shell structures. Analysis and design of shell structure (Hemi-spherical Dome) in R.C.C.
Module-5	Analysis & Design of Roof Trusses (Steel)	Introduction and terminology of Roof Trusses, Types of Trusses, Analysis and design of Roof Truss (Fan Type) in Steel.

APPROACH

1. Lectures by experts in the field of design and analysis will be arranged to make the student do independent design of structural elements.

REFERENCE BOOKS

1. Reinforced Concrete Design- AK. Jain.
2. Earthquake Resistant Design of Structures- Manish Shrikhande and Pankaj Agarwal.
3. Advance reinforced concrete design – P.C.Varghese.
4. Structural Design & Drawing Reinforced Concrete & Steel – N Krishna Raju
5. Steel Structures Design & Drawing – Prof. Harbhajan Singh Col. (Retd.)

**B. ARCH. SEMESTER – VIII
NAR – 804, TOWN PLANNING**

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	50	50	0	50	100	3	3 HRS.

OBJECTIVES

- To develop an appreciation of the planning issues involved at the scale of a town or a city.
- To expose the students to the history and development of planning, its relevance & application to modern day principles of town planning.

Module 1	Introduction to Town Planning	Definitions of town planning, form of planning, Elements and planning principal of city plan, Shapes of plan in accordance to road networks.
Module 2	Planning Concepts and Evolution	Planning concepts related to City beautiful movement (Chicago, Chandigarh), Urban Utopia (Broadacre), Garden city (Letchworth), Radburn Theory (Radburn) and Neighbourhood planning.
Module 3	Planning Process & Standards	Understanding of planning process. Relevance of standards in planning as per URDPFI guidelines prepared by TCPO.
Module 4	Roads and traffic studies	Awareness of concepts related to various traffic problems in India. Understanding of PCU, Traffic volume, Road capacities, Road types; their sections and intersections, Traffic calming as per IRC guidelines.
Module 5	Modern Transportation systems	New concepts in mass and rapid transportation systems e.g. BRT, LRT and Metro rail.
Module 6	Modern approach in Planning	Introduction, Benefits and Planning components of Green City (e.g. Vancouver), Compact City (e.g. Sky city, China) and Smart City (e.g. Malta)

REFERENCE BOOKS

1. John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
2. Arthur B. Gallion and Simon Eisner, The Urban Pattern – City planning and Design, Van Nostrand Reinhold company
3. Rangwala, Town Planning, Charotar publishing house
4. G.K.Hiraskar, Town Planning
5. Rame Gowda, Urban and Regional planning
6. S.K.Khanna, Highway Engineering, C.E.G. Jhusto, Nemchand & Bros. Roorkee 1997
7. N.V.Modak, V.N.Ambedkar, Town and country planning and Housing, orient longman, 1971
7. URDPFI Guidelines for Planning by TCPO.
8. IRC Guidelines

B. ARCH. SEMESTER –VIII
NAR – 805, ELECTIVE – I (A - ADVANCED COMPUTERS)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	50	50	0	50	100	3	3 HRS.

OBJECTIVES

- Computation is no longer limited to the ‘binary’ digits. A new understanding of application of the computers to design is beginning to arise, paving the way to a more interdisciplinary approach to design. The field of mathematics and engineering, design, natural sciences, and many more can inform each other in the virtual space. Material and structure systems are no longer mere receivers of design, they themselves, with the aid of right computer tools, have become the ‘generators’ of design.
- The main objective of this elective is to familiarize students with the potential of computers as a design medium, and not just a drafting tool. It will encourage them to look at architectural design as an interdisciplinary science and not just a stand-alone area. The program will expose the students to various practices (all over the world) using computation in architecture both as a medium to create complex geometry (iconic design) as well as a problem-solving engine. The three main sub-areas of study will be 1-Natural Systems 2- Material and fabrication 3- Urban Design. By talking about computation in reference to the above-mentioned areas, the elective will help prepare the students to have an overall understanding of the subject and at the same time prepare them to find their own ‘way’ into the world of computation.
- Tool: Rhinoceros 3D

Module 1	Computer as a Design Medium	Design thinking, Intuition, Human limitation.
Module 2	Natural Systems	Evolution of form in nature, Bio-mimicry, Fusion of space, Structure, Surface and material, Genetic algorithm.
Module 3	Material and fabrication	Parametric design, Works of researchers like Neri Oxman.
Module 4	Urban Design	Spacial properties of urban barriers: Space syntax

LIST OF ASSIGNMENTS

1. Deconstruct the design process of your favourite computation driven design.
2. Main idea: to reinforce in students the idea that process is more important than product.
3. Journey from complex 3D model in virtual space (rhinoceros 3d) to a physical model.
4. Main Idea: to extract the right information from a virtual 3D space to translate it into a real world form.
5. Natural systems- final report
6. Main idea: to understand the principle of form development in nature and translate it into an architectural useful concept.

REFERENCE BOOKS

1. John Frazer, An Evolutionary Architecture, Architectural Association Publications, Themes VII, copyright John Frazer and the Architectural Association 1995.
2. Makoto Sei Watanabe 2002, Induction Design: A Method for Evolutionary Design, Birkhäuser, Switzerland.
3. D'Arcy Wentworth Thompson 1966, On Growth and Form, Cambridge university press, London
4. Christopher Alexander 1964, Notes on Synthesis of Form, Harvard University Press, Cambridge, Massachusetts.
5. Mark Verstockett 1982, The Genesis of Form, from chaos to Geometry, Muller Bond and White limited, London
6. Lynn, G.: 1999, Animate Form, Princeton Architectural Press, New York.
7. Philip Drew, Frei Otto: Form and Structure– 1976
8. Alexander, C. (1965/1996), “A City Is Not a Tree“ in LeGates& Stout (eds.) The City Reader. Pp 118-131. Routledge, London.
9. Hillier, B.(1996), Space is the Machine Cambridge, UK.
10. Galofaro, L.: 1999, Digital Eisenman – An Office of the Electronic Era, Birkhauser, Basel
11. Jacobs, J. (1961) The Death and Life of Great American Cities. Penguin, London.
12. Patrik Schumacher : 2004, Digital Hadid

B. ARCH. SEMESTER – VIII
NAR – 805, ELECTIVE-I (B - ART TECHNIQUES)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	50	50	0	50	100	3	3 HRS

OBJECTIVES

- Objective of this subject is to develop the understanding and knowledge of creation technique, medium of arts and uses of their techniques in different mediums.

Module 1	Artistic Creation	Complete understanding of Perception, Communication, Imagination, Expression, and Creativity for artistic creation.
Module 2	Mediums of Expression	Visual Mediums - Painting, Sculpture and Architecture.
Module 3	Art Movements	To understand the thoughts and techniques involved in important art movements - Impressionism, Cubism, Constructivism, Optical Art, Kinetic Art.
Module 4	Activities	Students are expected to express their ideas through Posters, Murals, Building Art, Collage, Graffiti, 3D-Installations.

LIST OF ASSIGNMENTS

- Preparation of Reports and Tutorials.
- Drawing and Paintings following the impression and impact of important art movements.
- Designing various types of Posters, Murals, Building Art, Collage, Graffiti, 3D-Installations to express their feelings, thought and emotions.
- Composing various types of forms / patterns to understand the relation and language of forms, and to create sensible composition.
- Other art techniques.

REFERENCE BOOKS

1. Graphic Design Basics (IInd Edition), Amy.E. Aniston.
2. Practical Graphic Design Technique, Edited by – Lydia Darbyshire.
3. The Ultimate Drawing Workbook, Barrington Barber, Peter Gray.
4. Creative Design, Philip Rowson.

B. ARCH. SEMESTER – VIII
NAR – 805, ELECTIVE-I (C – ADVANCED BASIC DESIGN)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	50	50	0	50	100	3	3 HRS

OBJECTIVES

- To enable an understanding and informed appreciation for design as a problem solver. Also, it should give an introduction to the variety of mediums which can be used to induce improvement in any experience around a product or an artifact.

Module-1	Design Theory Refresher	<p>Elements of Design - Line, Colour, Value, Texture, Shape, Size, Space.</p> <p>Principles of Design - Pattern, Contrast, Emphasis, Balance, Proportion / Scale, Harmony, Rhythm / Movement;</p> <p>Design Process - Research, Analyse, Ideate, Prototype, Build, Test, Iterate.</p> <p>Basic Creativity Tools: Mind Mapping, Brainstorming, Reverse Brainstorming.</p>
Module-2	Design for Improvement/ Innovation	<p>Innovation, Designing to improve an accepted norm in a way to positively enhance the experience, Out of the box thinking.</p> <p>Fundamentals of User Centered Design approach, Empathy with the user, Rationalisation.</p> <p>Problem Solving Process - Identification, Factual Analysis, Improvement, Implementation.</p> <p>Providing solutions as quick fixes or as durable solutions based on use cases and requirements and available opportunities.</p>
Module-3	Design for Communication	<p>Colour - choice of colours in communication, designing for monochrome, bichrome, trichrome and multi chrome colour schemes.</p> <p>Typefaces - Understanding of types of Typefaces, Font Families, Expressive Typography. Compositions with type, Relationship of Typography to the context.</p> <p>Layout - Grids (Manuscript, Column, Modular, Hierarchical, Irregular)</p> <p>Relationship between syntactics, semantics and pragmatics, Relationship of colour, form and meaning, Explorations in visual abstraction.</p> <p>Understanding of Branding, Identity and Logo Design.</p>
Module-4	Design for Novelty / Disruption	<p>Designing to improve an accepted norm in a way to positively enhance the experience.</p> <p>Process of Disruption - Out of the box thinking for uncommon creative solutions for experiences that can be improved / altered, either by better streamlining of the workflow or through addition of a fun element to it.</p>

LIST OF ASSIGNMENTS

- Presentations by students -
 - Elements of Design
 - Principles of Design
 - Creativity Tools

REFERENCE BOOKS

- The Design of Everyday Things (by Donald Norman)
- Design Basics (by S. Pentak and A. Lauer)
- Thinkertoys (by Michael Michalko)

4. Visual Notes for Architects and Designers (by Norman Crowe and Paul Laseau)
5. Geometry of Design: Studies in Proportion and Composition (by Kimberly Elam)
6. Design as Future-Making (by Susan Yelavich and Barbara Adams)
7. The Design Process (by Karl Aspelund)
8. The Visual Display of Quantitative Information (by Edward Tufte)
9. Anatomy of Design: Uncovering the Influences and Inspiration in Modern Graphic Design (by Steven Heller and Mirko Ilic)
10. Universal Principles of Design, Revised and Updated: 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design (by William Lidwell, Kritina Holden, Jill Butler)

B. ARCH. SEMESTER – VIII
NAR – 805, ELECTIVE – I (D – VISUAL COMMUNICATION)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	50	50	0	50	100	3	3 HRS.

OBJECTIVES

- To enable an understanding and informed appreciation for the art of communication through visual media. Also, it should give an introduction to the variety of mediums which are used for conveyance of ideas and information in forms that can be read or looked upon.

Module-1	Anatomy of a Graphic Interface	Colour - choice of colours in communication, designing for monochrome, bichrome, trichrome and multi chrome colour schemes. Typefaces - Understanding of types of Typefaces, Font Families, Expressive Typography, Compositions with types and Relationship of Typography to the context. Layout - Grids (Manuscript, Column, Modular, Hierarchical, Irregular) Relationship between syntactics, semantics and pragmatics; Relationship of colour, form and meaning; Explorations in visual abstraction. Understanding of Branding, Identity and Logo Design.
Module-2	Print Media	A study of evolution of printing technology. Introduction to all the major processes of printing. Influence of printing process on design. Study of packaging using different materials.
Module-3	Digital Media	Basics of communication for digital consumption. Understanding of screen types / resolutions, available screen real estate, associated usage patterns and user expectations.
Module-4	Interactive Media	Understanding of affordances which each visual element provides, either on a digital screen or a physical artifact, in the age of interactive interfaces and experiences. Use of supporting mediums e.g. animations, gestures, video and audio for a holistic experiential communication.

LIST OF ASSIGNMENTS

- Corporate Identity (Print): Designing a complete branding proposal for a corporate house together with the necessary office stationery (e.g. Business Card, Letter Heads, Signages and Identity Cards etc.)
- Information Architecture and Visual Hierarchy (Print): e.g. Way finding tools (i.e. Printed Maps, Signages etc.) for a public space, Packaging Design for a product of everyday use
- Dynamic Graphics: Animated gif images (upto 8 frames) that convey/ reinforce simple ideas based on their usage scenario
- Identity/ Logo Design: Using visual elements to convey complex idea/ aspiration/ perceptions for an organisation/ event/ product in the simplest format possible, which is tied closely on the relevant use case for the resultant identity.
- Presentations by students :
Typefaces : Serif, Sans Serif, Ornamental, Script, Dingbats etc.
Principles of Colour Theory
Types of Layout Grids : Manuscript, Column, Modular, Hierarchical, Irregular

REFERENCE BOOKS

- The Elements of Graphic Design (by Alex W. White)
- Graphic Design School: A Foundation Course for Graphic Designers Working in Print, Moving Image and Digital Media (by David Dabner, Sandra Stewart, Eric Zempel)

3. Layout Essentials: 100 Design Principles for Using Grids (by Beth Tondreau)
4. 100 Ideas that Changed Graphic Design (by Steven Heller & Veronique Vienne)
5. Typography Sketchbooks (by Steven Heller & Lila Talarico)
6. The Graphic Design Exercise Book (by Jessica Glaser)
7. Universal Principles of Design, Revised and Updated: 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design (by William Lidwell, Kritina Holden, Jill Butler)

B. ARCH. SEMESTER – VIII
NAR – 805, ELECTIVE-I (E - ENERGY CONSCIOUS ARCHITECTURE)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	50	50	0	50	100	3	3 HRS

OBJECTIVES

- Sustainable architecture aims to create environment – friendly and energy efficient building by actively harnessing renewable nature sources of energy (solar energy etc) and utilizing materials that least pollute the environment.
- The objectives include creating awareness of designing energy efficient building envelopes that respond to the climate of a place bldg. lighting of resource – efficient practices in India, advocating of the application of renewable energy system and the promotion of efficient lighting & HVAC system to reduce energy demand.

Module 1	Climate and Shelter	Over view of the different Passive Solar Techniques & Climate responsive design features built form – open space relationship & façade articulation & appropriate use of building materials.
Module 2	Solar Energy and Buildings	Solar geometry and built form – Various techniques of shading to reduce heat gain in tropical climate. Various methods of Maximising exposure to solar radiation in cold & temperate climate. Heating & cooling loads –Energy conservation methods – Efficient day lighting, Solar Water heating system.
Module 3	Passive Solar Heating	Exercises on heating and cooling load calculations in buildings. General principles – Direct gain systems - Glazed walls, Bay windows, Attached sun spaces etc. Indirect gain systems – Trombe wall, Water wall, Solar Chimney, Transwall, Roof pond, Roof radiation trap, Solarium.
Module 4	Passive Cooling	Case studies on buildings designed with passive heating techniques General principles – Evaporative cooling, radiation cooling, Passive Desiccant cooling, induced ventilation, earth sheltering, Berming, Wind Towers, earth Air tunnels, Curved Roofs & Air Vents, Insulation , Vary Thermal wall.
Module 5	Site planning and Development	Case studies on buildings designed with passive cooling techniques. Land form & orientation, Vegetation & Pattern, Water Bodies, Open Space & Built form, Plan form & Elements, Roof form, Fenestration pattern & Configuration, Building envelope & finishes.

REFERENCE BOOKS

1. Fuller Moore, Environmental Control Systems, McGraw Hill, Inc., New Delhi, 1993.
2. A.Konya, Design Primer for Hot Climates, Architectural Press, London, 1980.
3. Climatically Responsive Energy Efficient Architecture, PLEA/SPA, New Delhi - 1995.
4. Ms.Sudha, N.K.Bansal and M.A.S.Malik - Solar Passive Building - Pergamon Press.
5. V.Gupta - Energy and Habitat - Wiley Eastern Limited, New Delhi.

B. ARCH. SEMESTER – VIII
NAR – 805, ELECTIVE-I (F - UNIVERSAL DESIGN)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	50	50	0	50	100	3	3 HRS

OBJECTIVES

- Understanding the concepts of universal design.
- Familiarization with key aspects and systems of universal design.
- Awareness to design norms and regulations of universal design.

Module 1	Introduction to Universal Design	Need of Universal Design, Definition of universal design, Universal design and equal status, The Principle of equal status, The situation today, The paradox. Complete understanding of Universal design, Barrier free & Inclusive design.
Module 2	Type of Effected Persons & Their Needs	Various disabilities - Non Ambulatory, Semi Ambulatory, Sight, Hearing etc. Old age persons, Women & Children in terms of effected persons, Dependency, Repercussions and Psychological needs.
Module 3	Universal Design Principles	The changing paradigm, Basic concepts of universal design, Challenges to Architects, Principles of universal design.
Module 4	Design & Planning Standards for Universal Design	Universal Design standards, Bye Laws. Space requirements for persons with various disabilities - Non Ambulatory, Semi ambulatory, Sight, Hearing etc. Old age persons, Women & Children.
Module 5	Case Studies	Documentation & presentation of case studies to understand the universal design principles; implemented in various building projects & spaces.
Module 6	Universal Design Implementation	Design Exercise of a small building project & space while incorporating Universal design standards & Bye laws.

REFERENCE BOOKS

1. Universal Design : Creating Inclusive Environment by Edward Steinfeld & Jordana Maisel
2. Universal Design for Learning : Theory & Practice by Anne Meyer, David H.Rose and David Gordon
3. Universal Design Handbook, 2E by Wolfgang Preiser, Korydon H. Smith
4. Barrier Free Design Guide: design for independence and dignity for everyone by Alberta
5. Guidelines and Space Standards for Barrier Free Built Environment for Disabled and Elderly Persons – Central Public Works Department, Ministry of Urban Affairs & Employment, India, 1998
6. IS – 4963 (1987), Recommendations for buildings and facilities for Physically Handicapped
7. Barrier-Free Design: Principles Planning, Examples, by Oliver Heiss, Christine Degenhardt, Johann Ebe (Birkhauser Architecture, 2010)

B. ARCH. SEMESTER – VIII
NAR – 806, ADVANCED SERVICES

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	50	50	0	50	100	2	3 HRS.

OBJECTIVES

- To develop an understanding of the advanced building services and their application in the design proposals of buildings of slight complex nature such as multistoried.
- The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

CONTENTS

Module 1	Gas Installation	L.P.G / Bio-gas installations, their location and layouts in residential and non-residential buildings
Module 2	Automated Parking System	Introduction, Types, Working and Advantages of automated parking system.
Module 3	Mechanical Ventilation	Standard requirements of ventilation for different conditions of living and works. Conditions for comfort. Control of quality, quantity, temperature and humidity of air.
Module 4	Control Room	Code of Safety prescribed in NBC.
Module 5	Waste Treatment & Management	Introduction, Reduce–Reuse–Recycle, Waste collection, Treatment & disposal. Thermal treatment Dumps and Landfills. Biological waste treatment. Waste water treatment
Module 6	Integrated Building Management System	The objectives of the Integrated Building Management System (IBMS), the list of utility, safety and security systems that are generally monitored and controlled through IBMS, the various components of IBMS, types of integration with the utility, safety and security systems and the basic knowledge on how they are designed and installed.

SUGGESTED EXERCISES

- Site visits of buildings where different types of advanced services equipments have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-storied building installation of these systems and the location of their parts and how they will be connected.

APPROACH

- Specialized lectures from technical people in the field.
- Practical and site based exercises to make the data more comprehensive.

REFERENCES

1. Understanding Building Automation Systems (Direct Digital Control, Energy Management, Life Safety, Security, Access Control, Lighting, Building Management Programs) by Reinhold A. Carlson, Robert A. Di Giandomenico
2. Building Automation: Control Devices and Applications by In Partnership with NJATC (2008)
3. Building Control Systems, Applications Guide (CIBSE Guide) by The CIBSE (2000)
4. Building Automation Online by McGowan; McGowan, John J.

B. ARCH. SEMESTER – VIII
NAR – 807, PROFESSIONAL PRACTICE – I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESSMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	50	50	0	50	100	3	3 HRS.

OBJECTIVES

- To acquaint the students with the role of an architect in society; scale of charges; an architect's conduct in architectural Practice.
- To familiarize a student with requirements of Architectural Competitions and appointment of a contractor through tenders.
- To familiarize the students with Easement rights.

Module-1	Role of Professional Bodies	The Indian Institute of Architects, its working constitution and byelaws, categories of membership, election procedures. The Uttar Pradesh Architects Association.
Module-2	Architects' Act 1972	Detail study of the Act, Council of Architecture; Procedures of membership.
Module-3	Scale of charges	Conditions of engagement of an architect – Duties; Responsibilities and liabilities of a professional architect; Scale of charges, mode of payment etc.
Module4	Code of Professional conduct & Architectural Competition	Clauses governing conduct of professional architect. Types of competitions; need and procedure for conducting competitions.
Module-5	Tender and Contract	Type of building contracts, their demands. Preparation of tender documents, method of inviting tenders, opening of tenders, preparation of comparative statement recommendation and award of projects, preparation of contract documents, general conditions of contract, interim certificates, defect liability period, retention amount and virtual completion.
Module-6	Easements	Introduction to various easement process and precautions to protect easement rights.

APPROACH:

- The course will be covered through lectures citing practical examples.
- Specialist should supplement the course through extension lectures.,

REFERENCE BOOKS

1. Dr. Roshan H. Namavati, Professional practice
2. Council of Architecture, handbook of professional document.
3. The Indian Institute of architects, The handbook of Professional Practice.
4. Madhav Devshaktu, Professional Practice

B. ARCH. SEMESTER – VIII
NAR – 808, DISSERTATION

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
0	5	0	-	-	50	-	-	50	100	5	-

OBJECTIVES

- To research on a theoretical topic which may be relevant to the final thesis topic and do the necessary background work.
- Present the findings in report form

Module-1 DISSERTATION

Preparation of an Architectural Dissertation including reference to an extensive study of architectural examples and precedents in the selected field of study. This can be a related study for the final thesis next semester.

EVALUATION OF DISSERTATION

It will be through internal evaluation.

REFERENCE BOOKS

1. Raman Meenakshi and Sharma Sangeeta, "Technical Communications – Principles and Practices", Oxford University Press, New Delhi.
2. Kate L. Tourabian, A manual for Writers of Research Papers, Theses and Dissertation, 8th edition.
3. Joseph Gibaldi, MLA handbook for Writers of Research Papers.