

SAURASHTRA UNIVERSITY



Re-Accredited Grade B by NAAC
(CGPA 2.93) "

FACULTY OF ARCHITECTURE

SYLLABUS FOR

Bachelor of Architecture

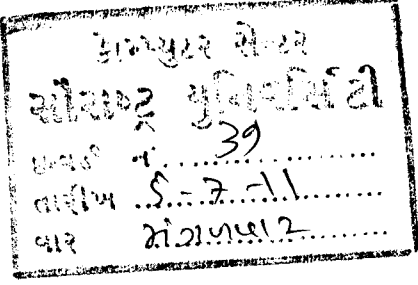
(Semester-I to X)

(Five Year Full Time Course)

In Force From June-2011

**SAURASHTRA UNIVERSITY
RAJKOT-360005 (GUJARAT)**

WEBSITE : www.saurashtrauniversity.edu



સૌરાષ્ટ્ર યુનિવર્સિટી



Re-Accredited Grade B by NAAC
(CGPA 2.93) "

B.Arch.
CBCS

પરિપત્ર :-

આથી સૌરાષ્ટ્ર યુનિવર્સિટી સંલગ્ન આર્કિટેકચર વિષયના અભ્યાસક્રમ ચલાવતી કોલેજના આચાર્યશ્રીને સવિનય જણાવવાનું કે, અધરધેન ડીનશ્રી આર્કિટેકચર વિદ્યાશાખાની ભલામણ પરત્વે આર્કિટેકચર વિષયની એડહોક બોર્ડ/વિદ્યાશાખાની તા.૩૦-૫-૨૦૧૧ ના સભાના ઠરાવ અન્વયેની આર્કિટેકચર વિષયના પાંચ વર્ષના સુધારેલ અભ્યાસક્રમ તથા આનુસાંગિક નિયમો ઓર્ડિનન્સ/રેગ્યુલેશન વિગેરે જુન-૨૦૧૧ થી ક્રમશઃ અમલમાં આવે તે રીતે માન.કુલપતિશ્રી ધ્વારા એકેડેમિક કાઉન્સિલ અને સિન્ડિકેટની મંજૂરીની અપેક્ષાએ બહાલી આપી મંજૂર કરેલ છે.

તદ્અનુસાર સંબંધીત સર્વેએ તે મુજબ તેનો અમલ કરવા વિનતી.

બિડાણ:- (ઉક્ત અભ્યાસક્રમ)

નં. એકે/બીઆર્કિ/ ૩૫૩ /૨૦૧૧
સૌરાષ્ટ્ર યુનિવર્સિટી કાર્યાલય,
યુનિવર્સિટી કેમ્પસ,
યુનિવર્સિટી રોડ,
રાજકોટ-૫
તા. ૧-૭-૨૦૧૧

એકેડેમિક ઓફિસર

૧૧/૭

પ્રતિ,

(૧) આર્કિટેકચર વિષયના અભ્યાસક્રમ ચલાવતી કોલેજના આચાર્યશ્રી તરફ....

નકલ સાદર રવાના ::-

- (૧) કુલપતિશ્રી / કુલસચિવશ્રીના અંગત સચિવશ્રી, (૨) કો-ઓર્ડિનેટરશ્રી, IQAC જરૂરી કાર્યવાહી સાડ
- (૩) ડીનશ્રી ઈજનેરી વિદ્યાશાખા (૪) સિન્ડિકેટ વિભાગ
- (૫) પરીક્ષા નિયામકશ્રી, ઉક્ત તમામ અભ્યાસક્રમની ૮-નકલ સાથે જરૂરી કાર્યવાહી અર્થે
- (૬) પી.જી. વિભાગ (૭) જોડાણ વિભાગ
- (૮) સામાન્ય વિભાગ (૮) યુજસી વિભાગ
- (૧૦) કોમ્પ્યુટર સેન્ટર, સૌરાષ્ટ્ર યુનિવર્સિટી, રાજકોટ. (પરિપત્ર સહિત અભ્યાસક્રમ યુનિવર્સિટી વેબસાઈટ પર મુકવા અર્થે)

નકલ સાદર રવાના ::- (જાણ સારું)

- (૧) શિક્ષણ કમિશનરશ્રી, ડો.જીવરાજ મહેતા ભવન, ગાંધીનગર
- (૨) ઉપસચિવશ્રી, શિક્ષણ વિભાગ, નવા સચિવાલય, ગાંધીનગર.
- (૩) ગુજરાત રાજ્યની સર્વે યુનિવર્સિટીઓ તરફ...
- (૪) સી.એમ. કાર્યાલય, નવા સચિવાલય, ગાંધીનગર
- (૫) શિક્ષણમંત્રીશ્રી ના અંગત સચિવશ્રી, નવા સચિવાલય, ગાંધીનગર
- (૬) ડો.વેદાંત પંડ્યા, કન્વીનરશ્રી, ઈન્ચાર્જ કન્વીનરશ્રી, નોલેજ કોન્સોર્ટીયમ ઓફ ગુજરાત, K.C.G. બ્લોક નં. ૧૨, ત્રીજો માળ, ડો.જીવરાજ મહેતા ભવન, ગાંધીનગર.

Ordinances & Regulations for the five (5) years degree course in 'BACHELOR OF ARCHITECTURE'.

A. ORDINANCES

O. ARCH. - 1 : CRITERIA FOR ADMISSION IN B.ARCH. DEGREE COURSE

A candidate is eligible to take admission in first (1st) year of five (5) year degree course of architecture, subject to his/her passing an Aptitude test in architecture and as per the minimum standards prescribed & revised by the C.O.A. time-to-time, under the Architects Act, 1972 and/or A.I.C.T.E.

O. ARCH. - 2 : EXAM CONDUCTING AUTHORITY FOR EACH SEMESTER

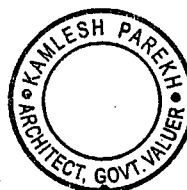
As per the norms of Council of Architecture to conduct University exams at the last year of both Stages, a candidate has to appear in four (4) exams conducted by the Saurashtra University and remaining six (6) exams conducted by the School of Architecture as explain in table given below.

Stage	Year	Semester	Exam conducting authority
1	Year - I	Semester - I	School of Architecture
		Semester - II	School of Architecture
	Year - II	Semester - III	School of Architecture
		Semester - IV	School of Architecture
	Year - III	Semester - V	Saurashtra University
		Semester - VI	Saurashtra University
2	Year - IV	Semester - VII	School of Architecture
		Semester - VIII	School of Architecture
	Year - V	Semester - IX	Saurashtra University
		Semester - X	Saurashtra University

O. ARCH. - 3 : CRITERIA FOR ELIGIBILITY TO APPEAR IN EXTERNAL EXAM

Followings are the 'Eligibility criteria' a candidate requires to fulfill, in terms of attendance & behavior; to be 'Eligible' in 'External' or 'End-of-term' exam for any subject, in any term.

1. As per the norms of Saurashtra University, a candidate has to attend minimum 80% of total lecture or practical periods conducted in each subject, in each semester in order to be eligible for final internal or external assessment/exam. If a candidate has deficit of maximum 10% (from 70% till 80%) due to medical-cause, the principal may condone the deficit on the basis of valid supportive evidences.
2. If a candidate remains absent for more than six (6) weeks without a valid reason in a semester, such absence shall be deemed as a discontinuation of study & he/she may seek fresh registration for same semester in next academic year.
3. A candidate who fails in attendance is required to repeat the subject & need to reappear as a fresh student for attendance & assessment in the next academic year.
4. A candidate has to demonstrate moral conduct & disciplined character during the term.



O. ARCH. – 4 : CRITERIA FOR PASSING

Followings are the 'Passing criteria' a candidate requires to fulfill, in terms of marks to 'Pass' any subject-head.

1. In case of subjects having only internal head, a candidate has to secure minimum 50% to pass the subject.
2. In subjects having internal & external head, a candidate is required to secure minimum 50% marks as aggregate to pass the subject. If a candidate secures less than 50% in the internal, still shall be allowed to appear for the external & has to achieve remaining/deficit marks in the external in order to secure minimum 50% as aggregate to pass the subject.
3. A candidate who fails to 'Pass' the subject, he/she is required to clear the failed head/s (head/s in which 50% is not achieved, i.e. internal or external or both). This can be better understood in table given below.

Case	Grade/Marks achieved in head/s			Status of the subject
	Int.	Ext.	Aggr.	Result
Case-1	≥50%	≥50%	≥50%	'Pass' in subject as 'Pass' in total
Case-2	≥50%	<50%	≥50%	'Pass' in subject as 'Pass' in total
Case-3	<50%	≥50%	≥50%	'Pass' in subject as 'Pass' in total
Case-4	≥50%	<50%	<50%	'Fail' in subject as 'Fail' in total, need to clear ext. to 'Pass' in subject
Case-5	<50%	≥50%	<50%	'Fail' in subject as 'Fail' in total, need to clear int. to 'Pass' in subject
Case-6	<50%	<50%	<50%	'Fail' in subject as 'Fail' in total, need to clear both, int. & ext. to 'Pass' in subject

O. ARCH. – 5 : STAGES OF STUDY OF FIVE-YEAR COURSE

1. As per the norms of Council of Architecture, 'Semesters – One (1) to Six' (6) (i.e. first (1st), second (2nd) & third (3rd) year) are considered as a 'First (1st) Stage' of course-duration; while 'Semester – Seven (7) to Ten (10)' (i.e. fourth (4th) & fifth (5th) year) are considered as a 'Second (2nd) Stage' of course-duration.
2. A candidate is required to complete first (1st) stage of study in maximum five (5) years and second (2nd) stage in maximum four (4) years.
3. A candidate who fails to complete any stage in given time-period, require to take readmission as a fresh candidate.

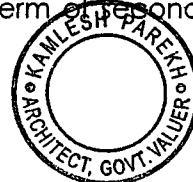
B. REGULATIONS

R. ARCH. – 1 : RESTRICTION FOR REAPPEARING IN 'PASS' HEAD &/OR SUBJECT

No candidate is allowed to reappear in any head &/or subject, which he/she has 'Clear' already. In subjects having both, internal & external head, if a candidate has 'Pass' either head but fails to 'Clear' the subject, is allowed to keep the respective 'Pass' head but required to 'Clear' the other remaining head in order to 'Clear' the subject.

R. ARCH. – 2 : CRITERIA TO KEEP THE TERM OF SEMESTER-II

A candidate who is eligible to appear but fails to appear or fails or passes the first (1st) semester examination shall be permitted to keep the term of second (2nd) semester with complete backlog of first (1st) semester.



R. ARCH. - 3 : CRITERIA TO KEEP THE TERM OF SEMESTER-III

1. A candidate who is eligible to appear but fails to appear or fails or passes the first (1st) year examination shall be permitted to keep the term of third (3rd) semester, if he/she has maximum backlog of sixteen (16) credits from accumulated from first (1st) year.
2. A candidate who has exceeded credit backlog shall not be promoted to next semester & need to re-appear in specific/all previous semester/s to clear the said backlog in next attempt, offered in next academic year.
3. For permissible credit backlog, a candidate having 'Internal' head backlog needs to re-attend 'Internal', offered in next term; while, a candidate having 'External' head backlog needs to re-appear in 'External', offered in next term.

R. ARCH. - 4 : CRITERIA TO KEEP THE TERM OF SEMESTER-IV

1. A candidate who is eligible to appear but fails to appear or fails or passes the third (3rd) semester examination shall be permitted to keep the term of four (4th) semester, if he/she has maximum backlog of sixteen (16) credits accumulated from first (1st), second (2nd) & third (3rd) semester.
2. A candidate who has exceeded credit backlog shall not be allowed to go to the next semester & needs to re-appear in specific/all previous semester/s to clear the said backlog in next attempt, offered in next academic year.
3. For permissible credit backlog, a candidate having 'Internal' head backlog needs to re-attend 'Internal', offered in next term; while, a candidate having 'External' head backlog needs to re-appear in 'External', offered in next term.

R. ARCH. - 5 : CRITERIA TO KEEP THE TERM OF SEMESTER-V

1. A candidate who is eligible to appear but fails to appear or fails or passes the fourth (4th) semester examination shall be permitted to keep the term of fifth (5th) semester, if he/she has maximum backlog of sixteen (16) credits accumulated from first (1st) & second (2nd) year.
2. A candidate who has exceeded credit backlog shall not be allowed to go to the next semester & needs to re-appear in specific/all previous semester/s to clear the said backlog in next attempt, offered in next academic year.
3. For permissible credit backlog, a candidate having 'Internal' head backlog needs to re-attend 'Internal', offered in next term; while, a candidate having 'External' head backlog needs to re-appear in 'External', offered in next term.

R. ARCH. - 6 : CRITERIA TO KEEP THE TERM OF SEMESTER-VI

1. A candidate who is eligible to appear but fails to appear or fails or passes the fifth (5th) semester examination shall be permitted to keep the term of sixth (6th) semester, if he/she has maximum backlog of sixteen (16) credits accumulated from third (3rd), fourth (4th) & fifth (5th) semester.
2. A candidate who has exceeded credit backlog shall not be allowed to go to the next semester & needs to re-appear in specific/all previous semester/s to clear the said backlog in next attempt, offered in next academic year.
3. For permissible credit backlog, a candidate having 'Internal' head backlog needs to re-attend 'Internal', offered in next term; while, a candidate having 'External' head backlog needs to re-appear in 'External', offered in next term.



R. ARCH. - 7 : CRITERIA TO KEEP THE TERM OF SEMESTER-VII

1. A candidate who is eligible to appear but fails to appear or fails or passes the sixth (6th) semester examination shall be permitted to keep the term of seventh (7th) semester 'Practical Training', if he/she has maximum backlog of sixteen (16) credits accumulated from third (3rd) year.
2. A candidate who has exceeded credit backlog shall not be allowed to go to the next semester & needs to re-appear in specific/all previous semester/s to clear the said backlog in next attempt, offered in next academic year.
3. For permissible credit backlog, a candidate having 'Internal' head backlog needs to re-attend 'Internal', offered in next term; while, a candidate having 'External' head backlog needs to re-appear in 'External', offered in next term.
4. If a candidate is unable to clear the credit backlog of stage - I during the practical training term, shall not be allowed to keep the term of semester - VIII and shall have to re- appear for the practical training (Semester - VII).

R. ARCH. - 8 : CRITERIA TO KEEP THE TERM OF SEMESTER-VIII

1. Followings are the criteria under which a candidate shall not be allowed to keep the term of eighth (8th) semester.
 - A. If a candidate fails to pass the 'Practical Training'.
 - B. If a candidate fails to pass the first (1st) stage of study.
 - C. If a candidate fails to pass all three (3) RSP offered in first (1st) stage only.
2. A candidate is required to complete 'Practical Training' in maximum three (3) successive terms and if a candidate fails to complete 'Practical Training' in given time-period, he/she requires to take readmission as a fresh candidate.

R. ARCH. - 9 : CRITERIA TO KEEP THE TERM OF SEMESTER-IX

1. A candidate who is eligible to appear but fails to appear or fails or passes the eighth (8th) semester examination shall be permitted to keep the term of ninth (9th) semester with maximum backlog of eight (08) credits.
2. A candidate who has exceeded credit backlog shall not be allowed to go to the next semester & needs to re-appear in specific/all previous semester/s to clear the said backlog in next attempt, offered in next academic year.
3. For permissible credit backlog, a candidate having 'Internal' head backlog needs to re-attend 'Internal', offered in next term; while, a candidate having 'External' head backlog needs to re-appear in 'External', offered in next term.

R. ARCH. - 10 : CRITERIA TO KEEP THE TERM OF SEMESTER-X

1. A candidate who is eligible to appear but fails to appear or fails or passes the ninth (9th) semester examination shall be permitted to keep the term of tenth (10th) semester, if he/she has maximum backlog of eight (08) credits accumulated from eighth (8th) & ninth (9th) semester.
2. A candidate who has exceeded credit backlog shall not be allowed to go to the next semester & needs to re-appear in specific/all previous semester/s to clear the said backlog in next attempt, offered in next academic year.
3. For permissible credit backlog, a candidate having 'Internal' head backlog needs to re-attend 'Internal', offered in next term; while, a candidate having 'External' head backlog needs to re-appear in 'External', offered in next term.



R. ARCH. – 11 : CRITERIA TO SUBMIT THESIS FOR EVALUATION

A candidate who is eligible to appear for tenth (10th) semester must have cleared all credit backlog before submitting the thesis for evaluation.

R. ARCH. – 12 : CRITERIA TO GET AWARD OF B.ARCH. DEGREE

A candidate shall only be eligible to get award of B. Arch. (Bachelor of Architecture) Degree if he/she passes the tenth (10th) semester completely.

R. ARCH. – 13 : CRITERIA TO GET AWARD OF CLASS IN RESULT

As per the norms of Saurashtra University, a candidate shall receive respective class as given below, if he/she passes all subjects in regular exam (i.e. in first attempt only) without getting grace marks in any subject.

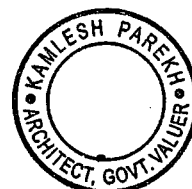
Sr.	Aggregate of Grand total	Class received
1	66% or more	First class with distinction
2	Between 60% to 65.99%	First class
3	Between 50% to 59.99%	Second class
4	For all other cases & for all repeat attempt	Pass class

R. ARCH. – 14 : CRITERIA FOR STUDIO-BASED SUBJECTS, ELECTIVES & RSP

1. For 'Studio-based subjects' like 'Design Studio' and 'Building Material & Construction'; the 'External' or 'End-of-term exam' may be in form of 'Viva' and/or 'Jury' and/or 'External exam/paper'.
2. A candidate is required to pass total eight (08) 'Electives' includes four (4) Design-based & four (4) Craft-based electives, offered from fifth (5th) semester onwards before submitting the tenth (10th) semester thesis.
3. All 'Electives' are mandatory & internal only and their respective credits are considered in calculation for respective term's credit-load, however if a candidate fails to 'Pass' any 'Elective', he/she is required to clear it in the next attempt, offered in the next term.
4. A candidate is required to pass all three (03) 'Related Study Programme' (RSP) offered in first (1st) stage.
5. A 'RSP' is mandatory & is internal only and is not part of respective term's credit-load, however if a candidate fails to 'Pass' any 'RSP', he/she is required to clear it in next attempt, offered in next academic year.

R. ARCH. – 15 : FORMATION & SCOPE OF EXAMINATION COMMITTEE

1. There shall be 'Examination committee' consisting of the following members:
 - a. Dean, Faculty of Architecture
 - b. Principal, School of Architecture
 - c. Head of Examination, School of Architecture
 - d. Subject expert/s as 'Invitees' (if required)
2. The 'Examination Committee' shall:
 - a. Ensure the compliance of prescribed 'Ordinance & Regulations'
 - b. Consider & award grace marks as per the provisions
 - c. Form 'Assessor panel' for regular assessment, rechecking & reassessment.
 - d. Rectify marks, if found revised in 'Rechecking' or 'Reassessment'.



R. ARCH. - 16 : CRITERIA FOR RECHECKING & REASSESSMENT

1. A candidate who fails only in 'External' head of a subject which eventually leads to 'Fail' in the said subject, can apply for 'Rechecking' & 'Reassessment' for such external head.
2. A candidate can apply for 'Rechecking' for all such heads, but can apply for 'Reassessment' for any one (1) head out of all.

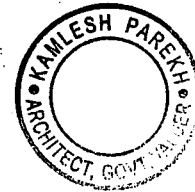
R. ARCH. - 17 : CRITERIA FOR GRACE MARKS

It shall be the sole discretion of Examination Committee to award 'Grace Marks and no appeal in this regard shall be entertained.

1. The grace marks shall be offered to 'External' head only and not to 'Internal' head.
2. Except Practical Training & tenth (10th) semester's Thesis, the grace marks is applicable to all other subjects having both, internal & external heads.
3. As per the norms of Saurashtra University, following is the scheme for grace marks applicable to 'External' head:

Sr.	Marks of 'External' head of subject, in which 'Grace marks' are required	'Maximum grace marks' can be awarded as a marks
1	Upto 100 marks	10 marks
2	Upto 200 marks	15 marks
3	Upto 600 marks	20 marks
4	More than 600 marks	25 marks

4. The grace marks can be applied to maximum three (3) subjects in each exam at a time; however the grace marks is applicable only, when after obtaining the grace marks, a candidate can 'Pass' the said subject/s.
5. Only minimum required grace marks shall be given, as required to pass the subject and the same shall not be added to subject total & Grand total; however they shall be mentioned separately in the result.



SUBJECT : HUMANITIES I
(HUM – I)
THE ASCENT OF MAN

*Course Code: 0110
*Semester: I
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent : The genesis and forces of evolution. The individual and the universal
“Self” – Their unity and diversities.
Values of Self and the world around. “I” –The total, the part, the observer, the
interpreter, the participant and the designer.
Formation of values & cultures.

Content: Emergence of universe- The formless and its formation in to the physical form
of Duals and Plurals. The overlaps of Physics and Metaphysics in appreciation
of “ The Mind-Matter” synonyms.

Tool making – A natural human evolutionary process, tools for extension of
man to reach universal scales: Tools for Mental efficiency extensions, Work
efficiency extensions and Management efficiency extensions
(Mantra- Yantra- Tantra)

The Eco-systems and Eco-cultures, their context and formation of value
Judgements at Global, Regional and Local scales. Formation of cultures and
civilizations as a process of “ Feel & Thoughts”.

Methodology: Workshops, Films, Lectures, Field trips, Group work & Individual studies.

Scheme of:

Examination 60%, 120 Marks internal assessment
40% 80 Marks end of the term examination

Total Marks - 200

Reading list :The Ascent of Man : Jacob Bronwsky.
The Making of Man : David Leakey
Atma Bodh – Chinmaya Mission
Prana Upanishad - Chinmaya Mission
Aittariya Upanishad - Chinmaya Mission
Vedanta and Modern Physics – Ram Krishna Mission
The Turning Point : Kapra Fritjot
The Tao of Physics: Kapra Fritjot
Space, Time & Architecture – Seigfrid Gideon

SUBJECT: BASICS OF DESIGN I
(B.O.D.- I)

ELEMENTS & PRINCIPLES OF DESIGN - I

*Course Code: 0120
*Semester: I
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent: Introduction to elements & principles of design

Content: Elements of design – Point and Line, Plane and Shapes, Form and Volume,
Light and Shade, pattern & texture.
Principles of Design – Rhythm; Harmony; Balance.

Methodology: Lectures, Field trips, Library ref. This course is read with & is concurrent to workshop-I

Scheme of Examination : 60% 120 Marks internal assessment
40% 80 Marks end of the term examination

Total Marks - 200

Reading list : Experiencing Architecture : Rossmassen
PATTERN LANGUAGE : Christopher Alexander
Form, Space & Order : D.K.Ching
What is Design : Paul Grille
Rendering with Pen & Ink.
Landscape Graphics : Grant W. Ried.

SUBJECT : STUDIO – I
SPACE MAPPING

*Course Code: 0121
*Semester: I
*Contact Hours: 96
*Credits: 4
*Marks: 400

Intent : Exploring human movement through Space, Experiencing Space in Time & Motion.

Content : Elements of Composition. (2D, 3D, 4D)
Anthropometrics & Ergonomics.
Mapping of Space. (Ideograms)

Methodology : Workshops, Lectures, Model making, (Real life within events & fictional ones within the body)

Scheme of Examination : 60% 240 Marks internal assessment
40% 160 Marks External Viva (Jury) / End of the term Examination

Total Marks - 400

Reading list : The Nature of Man- Moholi Nagy
Movies : Honey I shrunk the Kids.

SUBJECT: STRUCTURE – I
(STR – I)

*Course Code: 0130
*Semester: I
*Contact Hours: 48
*Credits: 3
*Marks: 300

Intent : Behaviour of materials and basic structural systems.

Content :- Glossary of technical words, natural structures and intuitive understanding of their behaviour, their relationship with man made structures.

Functions of structures. Primary and secondary forces acting on structures- gravitational force, live load, wind, temperature variation. Types of supports & their characteristics.

Analysis & design – Design criteria.

Primary elements of structure and their behaviour.

Factor of safety & factor affecting it. Characteristics of Structural design : strength, stiffness and stability. Discussion on factors affecting them and ways of satisfying these requirements.

Study of behaviour of structures through models and testing them for given load.

Methodology : Lectures, Presentations, Site visits etc.

Scheme of Examination :60% 180 Marks Internal assessment
40% 120 Marks End of the term examination

Total Marks - 300

Reading list :

**SUBJECT: BUILDING MATERIALS &
CONSTRUCTION – I
(B.M.C.- I)
THE BUILDING ENVELOPE AND ITS COMPONENTS**

*Course Code: 0131
*Semester: I
*Contact Hours: 96
(32+64=96)
*Credits: 4
*Marks: 400

Intent : Understanding the need for a building component and the various solutions available / possible to address the need.

Categories of the various building components in terms of Element, Material & Systems.

The five families of building materials – Rock, Organic, Metals, Families of building components Synthetics and Hybrids

Content : The three structural dimensions of materials – linear, planer and solid. Enclosures, Openings, Space connections, Base, Mechanical stabilisers, Service circulations, Surfaces & Finishes, Artefacts & Furnishings, Hardware & Accessories.

Construction drawings and Architectural graphic standards.

I.S. Specifications.
Glossary of technical words

To study the various building components & than categorise them into Various Programs & solutions.

Understand the considerations of Anthro-pometries, Type of use, Maintenance, Material Science & Physical context.

Methodology :Workshops, Building studies, Particular building element case studies, Documentation by sketches & drafting.

Scheme of

Examination: 60% 240 Marks internal assessment
40% 160 Marks end of the term Examination

Total Marks - 400

Reading list : Elements of Architecture – Rob Krier
Forms & Functions of 20th Century Architecture- Talbot & Hamlin, 1952
Columbia University, Volume II.
What is Design – Paul Grillo
Dictionary on Construction - D.K.Ching

**SUBJECT: ARCHITECTURAL
GRAPHIC TECHNIQUES I
(A.G.T.-I)**

*Course Code: 0140
*Semester: I
*Contact Hours: 72
*Credits: 3
*Marks: 300

Intent : To develop an understanding of technical drawing as a tool for communication.

Content : To develop control over instruments used for technical drawings.
Selection and care of drawing instruments and stationery.
Learning basic principles of Geometry and visualization in 3 Dimensions.

(I) Line exercise : Free hand lettering and lettering with instruments.

(II) Basic Geometry : Theory & Construction of Polygons.

(III) Projections : - Projections of Line, Basic Plane
& Solid (Simple & Complex)
- Isometry, Axonometry & Oblique projections.

(IV) Orthographic Projections : Exercise of complex solids

Methodology : Exercises based on control over pencil as basic medium
Principles of Geometry and its construction.
To develop visualization:
Exercises based on Isometric, Axonometric & Orthographic projections.

Scheme of Examination :60% 180 Marks internal assessment
40% 120 Marks end of the term Examination

Total Marks - 300

Reading list : Engineering Drawing: N D Bhatt.

Evaluation Criteria : Line quality
Understanding
Neatness.

SUBJECT: WORKSHOP – I

*Course Code: 0141
*Semester: I
*Contact Hours: 144
*Credits: 6
*Marks: 600

Intent Understanding the nature of Pencil and its disciplined explanation through hand skills.
Basic model making skills.

Content Different types of pencils, Pages, Grips and Postures.

Theory of Visual perception – Perspective (1pt., 2pt.) & Element of composition

Qualities of line

Board & wire varieties for model making. Techniques & tools for cutting, adding, carving & joining.

Methodology Through lectures, demonstration & exercises.

Exercises Line Exercise

- Perspective - Platonic solids and structure
- sketching - Landscape & Vernacular Settings
- Life study
- Rectilinear Buildings

Model making exercises.

Scheme of Examination: 100% Internal assessment

Total Marks - 600

SUBJECT: HUMANITIES II
(HUM – II)

*Course Code: 0210
*Semester: II
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent : Man, the integral entity of nature and animal kingdom. The basic human needs and methods devised to fulfill them. Formation of human communes with broader need based purpose of security and sharing.

Content : - Global and regional overview of formation of societies and similar design responses on Eco-cultural commonalties.

Man – Nature Symbiosis.

Varying natures of human communes in different Geo-climatic contexts.

Rise of cultural attributes. Regionalism and development of living traditions in time.

Migrations and diffusion of cultural motifs and Attributes. Tangible as well as intangible

Primitive cultural panorama of Indian tribal/Rural practices with focus on shelter and building craft. Himalayan and Sub-Himalayan, Deserts, The seven sisters (N E India), the Islands, the Coastal belt, the Riverine planes, The hinterland Hill ranges and Nomadic.

Each to be studied within the framework of

- Geography Exclusivity
- Material base
- Natural and Human Resource Base
- Racial / Cultural make up

Methodology : Introductory talks followed by participate group discussions with students Initiative, AV. and short field trips.

Scheme of

Examination :60% 120 Marks internal assessment
40% 80 Marks end of the term examination

Total Marks - 200

Reading list : Rudolfsky : Architecture without architects.
Paul Oliver : World Encyclopedia of Vernacular Architecture
Jacob Bronowsky : Ascent of Man

Social Anthropology elementary references:
Bhutanese Cultural Blueprint: Viewing.

Alternatively : Indian Cultural evolution : through a serial 'Bharat Ek Khoj' based on Pandit Nehru's Discovery of India

SUBJECT: BASICS OF DESIGN II
(B.O.D.-II)
ELEMENTS & PRINCIPLE OF DESIGN II

*Course Code: 0220
*Semester: II
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent : Development of architectural perception of space & place. Experiencing total built environment.

Content : Elements of design : Colour, Time and Motion
Principles of Design : Scale & Proportion, Emphasis & Focal point order
Elements of placemaking

Methodology: Lectures, Field trips, Library reference. This course is read with and is concurrent to Workshop II.

Examination : **Scheme of**
60% 120 Marks internal assessment
40% 80 Marks end of the term examination

Total Marks – 200

Reading list : Forms & Functions of 20th Century Architecture Volume I : Talbot & Hamlin
Volume II : Talbot & Hamlin
Elements of Architecture : Rob Crier
Visual Dictionary of Architecture : Francis D. K.. Ching
Pattern Language : Christopher Alexander
Timeless way of Building : Christopher Alexander

SUBJECT: STUDIO – II
PLACE MAKING

*Course Code: 0221
*Semester: II
*Contact Hours: 96
*Credits: 4
*Marks: 400

Intent : Understanding of how Space become Place, Elements of place making such as moods, culture, traditions & aspirations.

Content : Place making

Psycho – Semitic Dimensions: The part, participant, observer and creator of instruments and places as his own extension related to specific purpose and specific contents.

Place making through space, surfaces, envelopes, symbols, stage making with colors, textures, symbols, light, shades & darkeners, culture, technology, period & place and people's context.

Man – Nature Interfacing

Theatre, Stage Craft and Architecture: Their similarities and differences.

Methodology : Workshops, Lectures, Model making, Slide shows, Library ref.

Scheme of

Examination : 60% 240 Marks internal assessment
40% 160 Marks External Viva (Jury) / End of the term Examination

Total Marks - 400

SUBJECT: STRUCTURE – II

*Course Code: 0230
*Semester: II
*Contact Hours: 48
*Credits: 3
*Marks: 300

Intent : To develop a grasp of behaviour of materials and basic structural systems.

Content:- Structural properties of basic materials like masonry, timber, concrete & steel.

- Introduction to basic structural systems such as post beam, bearing wall system, trusses, rigid frames and their structural behaviour. Distribution of loads through the elements of the system. Case studies.
- Effect of simple geometric forms on the overall structural behaviour.
- Forms to be studied include cuboidal and prismatic with symmetrical footprint layouts. Aspect ratio and its effect on the overturn resistance.
- Working out structural systems and their layout for a small building.

Methodology : Lectures, Presentations, Site visits etc.

Scheme of

Examination : 60% 180 Marks Internal assessments
40% 120 Marks End of the term examination.

Reading list : Understanding the concepts of structures
Reinforce concrete design - Junarkar
Analysis of structures - Vajeerani

**SUBJECT: BUILDING MATERIALS
& CONSTRUCTION – II
(B.M.C.-II)**

*Course Code: 0231
*Semester: II
*Contact Hours: 96
(32+64=96)
*Credits: 4
*Marks: 400

Intent: To understand mud & stone through its various categories, compositions, and its applications as building material through direct adaptation, processing. Amalgamating and altering. The various end product materials that have evolved their various adaptations for building and the processes & specifications involved there in. To develop a grasp of what material or material product is appropriate for which context of building construction. Vernacular, Traditional and Historical Materials and construction process as direct human creative responses to local Eco – systems and Geo- bio climatic responses.

Content: Tools and Techniques for extracting, manufacturing, transporting, processing and application

- Amalgamation & alteration in clay
- Introduction to mud architecture
- Amalgamations & alternation in clay
- Tools & Techniques for extracting, manufacturing, transporting, processing & application
- Geology, Stone quarrying and stone size / quality
- Objects & decay maintenance
- Stone products & substitutes
- Stone construction principles
- Stone detailing
- Brick composition, its properties and principles of brickwork
- Ornamental & decorative work
- Industrialized material products, industrial study
- Market survey & Trade names for material products
- Types of applications
- Relevant I. S. Specifications
- Genesis of local Architectural Mediums

Methodology : Lectures, Field trips (Material study, Construction study), Seminars, Slide shows, Market survey, Case studies, Material centric design problems and firsthand experience of brickwork

Scheme of

Examination : 60% 240 Marks Internal assessment
40% 160 End of the term examination

Total : 400 marks

Reading list :- Ornamented brickwork

- Brickwork
- Building materials : Rangwala
- Building construction : Rangwala
- Building construction : WB Mc Kay
- Materials for Architects & Builders : Arthur R Lyens

SUBJECT: WORKSHOP II

*Course Code: 0241
*Semester: II
*Contact Hours: 120
*Credits: 5
*Marks: 500

Intent Understanding the nature of wet media and color through disciplined explanation by hand skills. Water / Solvent based materials for model making, artifacts and furniture.

Content Different types of wet medias and varieties there in.

*ink, water, colors and poster colors. When to use what vis-a-vis test at hand.

*The various tools, techniques, surfaces vis-a-vis the media and effect to be generated.

*Corrective techniques

*Different types of clay, P.O.P., rubber solutions and fibre glass. The tools, techniques and preservation methods.

Methodology: Through lectures, presentations and demonstration and exercises.

Scheme of

Examinations: 100% 500 Marks Internal assessments

Total : 500 marks

**SUBJECT: ARCHITECTURAL
GRAPHIC TECHNIQUES II
(A.G.T.-II)**

*Course Code: 0240
*Semester: II
*Contact Hours: 48
*Credits: 2
*Marks: 200

Intent : To develop an ability to perceive a form in 3 Dimensions and represent it through technical drawings. To enhance the sense of visualization and strengthen it by means of technical representation of Form & Space.

Content : Understanding of Planes and Solids in various conditions through development of surfaces, sectional profiles and complexities of transformation of Forms. 3 Dimensional representation of solids using Isometric, Axonometric and Basic Perspective views to visualize various configurations of solids.

(I) Development of Surface:

- Development of lateral surface of right solids (Simple) & section solids, Cube, Prism, Hexagon, Cylinder, Pyramid, Cone, and Sphere.
- Model making.

(II) Intersection of Solids.

- Introduction, different methods of intersection.
- Intersection between Solids of similar nature; i.e. Two prism, Cylinder & Cone etc.
- Intersection between Solids of non-similar nature; i.e. Cone & Cylinder, Cylinder & Prism etc
- Model making.

(III) Perspective:

- Theory of Phenomena of perceiving Form.
- Understanding of Core of Vision, Terminology of perspective
- One point, Two point, Three point, Bird`s eye & Worm`s eye views for simple Solids & complex Forms.

(IV) Sciography :

- Theory
Line, Planes, Solid (Simple & Complex), Chajja, Steps.

Methodology : Various exercises based on

- Understanding of surface of solid and its intersections.
- Application of understanding of perspective, light & shadow and its behaviour.

Scheme of

Examination : 60% 120 Marks internal assessment
40% 80 Marks end of the term examination

Total Marks : 200

Reading list : Basic Perspective:

SUBJECT: SENSES AND SENSIBILITIES – I
(S & S-I)

*Course Code: 0250
*Semester: II
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent : Sensory receptors and their extensions and Explorations in Human sensuality. Transmission of the higher sensory awareness on to the spatial arrangements. Further explorations in to spatial harmony through sensory indulgence.

Content : Exercises and discourses aimed at heightening the sensory awareness. These to include the visual, Audio, Olfactory, Touch & Tectile as well as taste. Primary discourse on the traditional discourse on the traditional system of the Rasas, Sects and cults that emphasize the concepts of liberation through Sensory indulgence. Extensions in terms of the indigenous developments of the musical systems, the visual arts, traditional Expressions of different scales of social organization and different kinds of social organizations in built form.

Issues of social organization-urban sociology-social anthropology.

Conveyed meanings in terms of societal values, communication patterns, symbols and meanings. Selected examples from vernacular and classical cultures in India and other parts of the world. The course would deal with the topic through lectures and field study.

Creation of a physical envelop/model where all sensory attributes harmonize. Overall aim of the course would be enhance the physical, emotional and spiritual well being of the end user of designed spaces. Demonstrations / Experiments / Experiences in the realm of induced sensuality between the animal kingdom and nature.

Scheme of
Examination :100% 200 Marks internal assessment

Total Marks : 200

SUBJECT: HUMANITIES III
(HUM – III)

*Course Code: 0310
*Semester: III
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent : Secure geography breeds long lasting cultures with far reaching impact. Resulting in to far sighted political, economic and administrative systems and accumulation of wealth. thus, providing way to highly refined and diffused cultural attributes. Pre – Christian Indian Cultural Scenario as the base for absolute flux of later cultural invasions

Content: The ancient mother cultures as healthy breeding ground for later cultural panorama.
Indian and Par – Indian Panorama : Pre Vedic, Vedic Epical era.
Pre – Christian, Republician era up to Eclipse of Buddhism in India with focus on Cultural practises, artifacts and Architectural idioms.

- Chinese
- Egyptian
- Meso-american
- Mesopotamian
- Conclusive overview

Methodology : Introductory talks followed by participative group discussions with student's initiative, AV and short field trips.

Scheme of

Examination : 60% 120 Marks internal assessment
40% 80 Marks end of the term examination.

Total Marks - 200

Reading list : John Whitney Hall : History of the World
Percy Brown : History of Indian Architecture
Sir Benister Fletcher : History of Architecture
Pearce F G : Outline History of Civilisations
Bhartiya Vidya Bhavan : History and Culture of the Indian people,
Oxford Encyclopeadia of Arts
Compulsory viewing of Films : Prince of Egypt, Benhar, The Last Emperor,
Cleopatra, etc.

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SUBJECT: BASICS OF DESIGN III
(B.O.D.-III)
PATTERNS IN NATURE

*Course Code: 0320
*Semester: III
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent : There is an order in this Universe which is manifested into everything
To develop an understanding that design issues though perceived as subjective have a deep objectivity about them and nothing in the design of nature is Ad-hoc. Taking the journey of culture to Human interventions in Habitat making.
Land – Man Resources. Their individual definitions & their interactive Systems & synonyms

Content : Patterns in Nature
Treatises of Aesthetics & Design.
The Eco cultures
The three traditions: Perennial, changing & modern.
Understanding of Vernacular Architecture under different contexts
Dynamics of Change and Vernacular values..

Methodology : Lectures, Field trips, Library ref.

Scheme of Examination : 60% 120 Marks internal assessment
40% 80 Marks end of the term examination

Total Marks - 200

Reading list : Genius Loci – Christian Norberg Schulz
The Nature of order – Christopher Alexander
Nature and Design
Vernacular Architecture

SUBJECT: STUDIO III

*Course Code: 0321

*Semester: III

*Contact Hours: 96

*Credits: 4

*Marks: 400

Intent : To develop an attribute towards the interactive processes between Man & Land to given locational Eco-cultural context.

Content :Study of Land

- Definition
- Geology
- Geography
- The skies

Elements of Earth, Water, Fire, Air & Space – Their architectural associations

Studies of Vernacular settlements.

Program preparation & creation of database.

Alternative technologies and Architectural Interventions in the context of change & development, the people participation Act documented in understanding Amendments 73 & 74 / 1991 of the Constitution of India.

Architectural Projects related to the said situations and contexts.

Methodology:Simulation of Patron, beneficiary and users. Site documentation. Case Studies

Scheme of

Examination : 60% 240 Marks internal assessment
40% 160 Marks External Viva (Jury) / End of the term Examination

Total Marks - 400

Reading list :

SUBJECT: HISTORY OF ARCHITECTURE – I
(H.O.A.- I)

*Course Code: 0322
*Semester: III
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent: *The triggers in technological evolution through the perspective of representation of material : an understanding
*The resultant built forms
*Variations in material expression peculiar to regions
*Individual exploration by architects in the same direction

Content: *The history of 'spanning': technological breakthroughs in various materials in chronological order
*Studies of unique built form in different regions: Chinese, Japanese, South Indian, Mesopotamia, Mayan Region
*Works of Hassan Fathy, Laurie Baker, Mies Van de Rohe, Louis Kahn, Frank Lloyd Wright

Methodology:*Lectures, Slideshows, Readings, Documentations, Seminars, Modelmaking workshops

Scheme of

Examination :60% 120 Marks internal assessment
40% 80 Marks end of the term examination

Total Marks – 200

Reading list: *Richard Lannoy, The Speaking Tree
*Christian Noberg Schultz, Genius Loci: Towards a Phenomenology of Architecture
*Christian Noberg Schultz, Existence, Space and Architecture
*Pedro Guidess, Encyclopedia of architecture
*Rudolfsky, Architecture without architects
*Bronovsky, Ascent of man

Papers: *Rafael Moneo
*Frank Lloyd Wright
*Louis Kahn
*Laurie Baker

SUBJECT: STRUCTURE – III

*Course Code: 0330
*Semester: III
*Contact Hours: 48
*Credits: 3
*Marks: 300

Intent: To develop an understanding of basic requirement of stability, strength of material and behaviour of basic structural elements and their importance in structural system.
To develop a grasp on the fundamental aspects of static analysis – strength of materials and structural analysis of basic elements.

Content: *

- * Conditions of equilibrium of concurrent coplanar forces, methods of projections. Funicular polygon Graphical method of determining the resultant of a given system of forces. Method of moments.
- * Centre of gravity, determining the centroid of simple figures. Moments of inertia, its application to sections subjected to bending, determining M.I. of simple and compound sections.
- * Types of trusses, their uses, suitability and limitations, method of analysing a truss (graphical & analytical)
- * Assumption in strength of materials, basic terminology, brief history of strength of materials.
- * Bars subjected to change in temperature, bars of non-uniform cross section
- * Concept of the shear force and the bending moment, S F and B M diagrams in the selection of a structure system – Discussion on case studies.
- * Pure Bending stress & its importance, derivation of basic equation, solution of simple problems.
- * Combined direct and bending stresses, Kern and its importance, solution of a few practical problems.
- * Brief discussion on stability, buckling of columns, short and long columns, Euler`s and buckling load effects of end conditions on the buckling load. Solution of a few simple problems, ways of increasing the capacity of a long column.
- * Deflection and its importance, code provisions, study of the deflected shape of simple structures. Solutions of problems.
- * Concept of shear stress, average and maximum shear stress. Horizontal shear stress and its variation across the cross section of the beam.
- * Section made up of more than one material (composite sections), their uses and their advantages, assumptions made in the theory of composite sections, derivation of basic equations. Solution of simple problems.

Methodology: Lectures, Presentations, Site visits etc.

Scheme of

Examination: 60% 180 Marks Internal assessment
40% 120 Marks End of the term examination

Total Marks : 300

Reading list : Understanding the concepts of structures
Reinforce concrete design - Junarkar
Analysis of structures - Vajeerani

SUBJECT: BUILDING MATERIALS
& CONSTRUCTION III
(B.M.C.-III)

*Course Code: 0331
*Semester: III
*Contact Hours: 96
(32+64=96)
*Credits: 4
*Marks: 400

Intent: Understanding & grasp of Bio-materials through its various categories, compositions, and its applications as building material through direct adaptation, processing, amalgamating & altering. The various end product materials that have evolved, their various adaptations for building and the processes & specifications involved there in. To develop a grasp of what material or material product is appropriate for which context of building construction.

Content: Timber in its natural form
Industrial timber products- Boards, Sheets, and Blocks
Bamboo and Cane
Jute and Grass
Basic joinery, Hardware, Tools and Equipments required
Application
Temporary Construction works
Finishing / protective treatments to various materials
Specifications
Relevant I. S. Codes

Methodology: Lectures, Fieldtrips, Documentation, Workshops, Seminars, Slide shows.

Reading list: Wood and woodjoints
Building materials : Rangwala
Building construction: Rangwala
Building construction: WB Mackey
Understanding wood
Carpentry and Joinery
Bamboo and Cane : NID Publication
Metirate series . Building construction principles & practices: D. Watten.

Scheme of

Examination: 60% 240 Marks Internal assessment
40% 160 Marks End of the term examination

Total Marks - 400

**SUBJECT: ENVIRONMENTAL SCIENCE &
SERVICES – I**
(E.S.S.- I)

*Course Code: 0332
*Semester: III
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent: Basics of environmental climatology and its adaptation by human being in built form (Understanding of climate as modifying factor of built environment)
Thermal Design & Natural Ventilation in the building

Content:

Appr. Hrs. Allocation

Basics of Climatology	Total 8 hrs
▪ Earth & relation with solar system	0.5
▪ Atmosphere and its stratification, phenomena of seasons	0.5
▪ Understanding of Climate and weather, Elements of climate	1
▪ Classification of climatic zone, sub-zone, their formation and design responses in general and cross culturally	1.5
▪ Site-climate and local responses	1
▪ Organizing climatic data and its interpretation – Mahoney table, Bio-climatic chart etc	1.5
▪ Exercise/ Presentation	2

Thermal Design & Human-comfort Criteria	Total 12 hrs
▪ Understanding of human body's comfort level	0.5
▪ Defining Comfort, Comfort zone & scale	1.5
▪ Thermal factor, its impact on human comfort	1
▪ Different way of heat gain in the building	1
▪ Behaviour of material/s to heat gain	2
▪ Types of thermal design - active & passive methods	4
▪ External shading devices and design	
▪ Exercise/ Presentation	2

Natural Ventilation	Total 6 hrs
▪ Purpose of Ventilation, Methods of Ventilations	1
▪ Issues related to cross ventilation at building level <ul style="list-style-type: none"> ○ Form & orientation ○ Design and detail of openings ○ Shading devices 	3
▪ Exercise/ Presentation	2
▪ Final Design (Overall Integration of lesson learnt) + Internal Test	Total 6 hrs

Methodology: Largely lecture based, discussions on case studies of traditional/vernacular surroundings, studio base exercises, application of it in design studio and design demonstration in environmental lab.

Scheme of

Examination: 60% (120 Marks - Internal assessment)
40% (80 Marks - End of the term examination)

Total Marks – 200

Reading list:

1. National Building Code Of India [Bureau Of Indian Standards]
2. Manual Of Tropical Housing And Building [Part-1, Climatic Design] [Otto Koenigsberger, Ingersoll and Mayhew]
3. Neufert Architect's Data [Ernst & Peter Neufert-3rd Edition]
4. Design With Climate – Bio-Climatic Approach to Arch. Regionalism [Victor Olgay]
5. Climate & Architecture [Jeffery Ellis Arouhus]
6. The Architecture Of The Well Tempered Environment [Banham & Reyner]
7. Timesaver Standards For Architectural Design Data [Watson, Crosbie-7th Edition]
8. Timesaver Standards For Architectural Design Data [Calendar-6th Edition]
9. Design Primer For Hot Climates [Allan Konya]
10. An Introduction to Building Physics [Narasimhan V.]
11. House Form and Culture [Amos Rapport]
12. Housing, Climate and Comfort [Evans Martin]
13. Building Environment [D Ajitha Simha]

**SUBJECT: ARCHITECTURAL GRAPHIC
TECHNIQUES III
(A.G.T.-III)**

*Course Code: 0340
*Semester: III
*Contact Hours: 48
*Credits: 2
*Marks: 200

Intent To develop a grasp of how basic geometrical forms and various permutations, combinations, additions & alteration between them can be used as a tool in the process of evolution of complex built forms.

Content : Using Geometry as a tool to experience Space and develop Logical reasoning within the context, to be able to technically represent

To visualize natural Elements and read and transform them in to basic geometry & also to study man made patterns & find their derivatives in nature.

Methodology: Exercises based on Curves, & Natural elements
Conic section : Ellipse, Parabola, Hyperbola.
Cycloid curves: Involute, Evolute, Spirals, Helix

Examination : **Scheme of**
60% 120 Marks internal assessment
40% 80 Marks end of the term examination.

Total Marks - 200

Reading list : Engineering Drawing – N. D. Bhatt

SUBJECT: WORKSHOP – III

*Course Code: 0341

*Semester: III

*Contact Hours: 72

*Credits: 3

*Marks: 300

Intent Understanding the nature of Bio materials i.e. wood, cane and bamboo. Its limitations and possibilities in various application vis-a-vis model making and small artifacts and small furniture.

Content Different types of wood, cane and Bamboo, their applications possibilities vis-a-vis task on hand, cutting, carving, stocking and other treatments of materials
jointing, bending and carving through various techniques.
Finishes and regular maintenance.

Methodology: Lectures, Presentations, Demonstrations and Exercises.
Exercises: Usage of various tools with a view to understand the material
Making of an actual artefact

Scheme of Examination 100% 300 Marks internal assessment

Total Marks - 300

SUBJECT: HUMANITIES IV

*Course Code: 0410

*Semester: IV

*Contact Hours: 32

*Credits: 2

*Marks: 200

Intent: Learned patronage and deep-seated percolation leads on to highest pinnacle of cultural refinement.
Study of the derivative cultures with a view to understand and absorb the reasons, processes and cultural objects including Architecture which leads on to the peak of design expression.

Content: Indian up to the British polyglot culture.
Japanese,
Java, Sumatra & Combodia
Greek,
Roman

Methodology: Visits to Neo – Classical (European)
Indian Architectural Sites through audio visual
Lectures, discussions with AV
Library references including Ahemdabad, Vadodara, Mumbai

Scheme of

Examination: 60% 120 Marks internal assessment
40% 80 Marks end of the term examination.

Total Marks - 200

Reading list:

Gibben's	: Decline and fall of the Roman empire
Bannister Fletcher	: History of Architecture
Bannister Fletcher	: Architecture of Combodia
Percy Brown	: Indian Architecture
John Mitchel	: Indian Architecture
Adam Hardy	: Indian Architecture
John Whitney Hall	: History of the World
Hitchcock	: History of the World

SUBJECT: BASICS OF DESIGN IV
(B.O.D.-IV)
ARCHITECTURAL DESIGN METHODOLOGY

*Course Code: 0420
*Semester: IV
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent :To evolve intelligent appreciation & develop vocabulary for discussing architectural design idea.

Content : - Information processing and research methods.
- Design as multivariate problem solving process
- Theories of programming, Thinking techniques, Environmental behavior & psychology, Optimization processes.
- Influences governing information of Attributes as prelude to the Act of Design. Positive group interactive & “ Brain Storm” processes.
- Generating of creativity, design matrices and system integration. Design synthesis process.

Methodology : Lectures, Field trips, Library ref.

Scheme of Examination : 60% 120 Marks internal assessment
40% 80 Marks end of the term assessment.

Total Marks - 200

Reading list :1. Structuring of scientific revolution
2. Who moved my cheese

SUBJECT: STUDIO IV

*Course Code: 0421
*Semester: IV
*Contact Hours: 96
*Credits: 4
*Marks: 400

Intent : Man and Land interactive processes to given locational Eco-cultural context. To develop a grasp on handling various activities with shared elements. Inter-relations of individual within a group / family. Developing clarity of details & architectural expression in functional and acoustical elements. Emphasis shall be laid on clarity of details and architectural expression in functional and constructional elements.

Content : Families & Habitats: Geographical locations
Year cycle & Day cycle
Seasons & Festivals
Icons & Symbols.

Design of a group of building and ancillary. Introduction to concept of shared open space, clustering, community, aggregation and economy. Emphasis will also be laid on site planning. This shall be a group exercise with each member handling a different aspect or a different portion of the total problem.

Problems aimed at drafting and presentation skills in the 3-D Format.

Emphasis shall be laid on clarity of details and architectural expression in functional and constructional elements.

Methodology : This shall be a group exercise with each member handling a different aspect or a different portion of the total problem.

Hands on

- 1- Site survey / mapping, documentation, representation through models, sketches. photographs at different times / situations.
- 2- Lectures, Slide shows, Library ref.

Scheme of

Examination : 60% 240 Marks intermediate assessment.
40% 160 Marks External Viva (Jury) / End of the term Examination

Total Marks - 400

Reading list :

SUBJECT: HISTORY OF ARCHITECTURE – II
(H.O.A.-II)

*Course Code: 0422
*Semester: IV
*Contact Hours: 40
(16+24=40)
*Credits: 2
*Marks: 200

Intent: *Understanding the evolution of architectural character and built form in the ancient civilizations

Content: *Egypt and Near East
*Greek Classical architecture
*Roman
*China, Japan and South east Asia
*Indian Architecture upto Islamic invasion
*Mesoamerica (Mayan architecture)

Methodology: *Lectures, Slideshows, Readings, Documentations, Seminars, Analytical understandings

Scheme of

Examination: 60% 120 Marks internal assessment
40% 80 Marks end of the term examination

Total Marks - 200

Reading list: *Richard Lannoy, The Speaking Tree
*Christian Noberg Schultz, Genius Loci: Towards a Phenomenology of Architecture
*Christian Noberg Schultz, Existence, Space and Architecture
*Christopher Alexander, A Pattern Language
*Christopher Alexander, The timeless way of building
* Christian Noberg Schultz, Intensions in Architecture
*Henri Sterlin, Architecture of the world, Living Architecture series
*Percy brown, History of Indian Architecture

SUBJECT: STRUCTURE - IV

*Course Code: 0430
*Semester: IV
*Contact Hours: 48
*Credits: 3
*Marks: 300

Intent : To understand behavior of advanced elements in structure.
To study Steel as structural material and the role of properties of material and behavior of elements in evolution of structural system is carried out.

Content : - Determinate and indeterminate structures, finding indeterminacy of structures.

Advantages and disadvantages of intermediate structures

-Analysis of indeterminate structures. Introduction to stiffness and distribution factors, introduction to moment distribution method.

- Indeterminacy of a frame, comparison of post and lintel system and portal frames. Importance of portal frames in resisting horizontal forces.

- Arch as a curved element. Arch in history, Efficiency of an arch. Three hinged arch. Simple problems to illustrate the importance of the shape of an arch. rose end conditions and loading.

- Steel as a structural material, structural systems in steel IS 800 & handbook of steel sections.

- Designing and detailing the bolted connections. Design of simple welded connections.

Methodology : Lectures, Presentations, Site visits etc.

Scheme of

Examination : 60% 180 Marks Internal assessment
40% 120 Marks End of the term examination

Total Marks - 300

Reading list : Understanding the concepts of structures
Reinforce concrete design - Junarkar
Analysis of structures - Vajeerani

**SUBJECT: BUILDING MATERIALS
& CONSTRUCTION IV**
(B.M.C.-IV)

*Course Code: 0431
*Semester: IV
*Contact Hours: 96
(32+64=96)
*Credits: 4
*Marks: 400

Intent: Advances in the usage of ferrous and non-ferrous metal, Cement as material, initially as mortar & later as concrete has revolutionised the possibilities of building. To develop a grasp of possibilities & limitations of Metals, Cement, Concrete & RCC.

Content:

- History of Cement as material from Lime to Cement.
- Cement manufacturing
- Storage and handling of Cement
- Cement physical and chemical properties
- Concrete: its making types and properties
- Quality control of concrete and quality components
- RCC its properties
- Points to observe while supervising RCC works
- Cement based products – Precast concrete
 - Prestressed concrete
- Tests, defects and failure, maintenance & repair
- Applications
- Specifications and I.S. Code
- Metals – Iron, Steel, Aluminium, Copper, Lead, Zink. Their manufacturing (brief), applications & properties.

Methodology : Lectures, Fieldtrips, Documentations, Workshops, Seminars, Slide shows.

Scheme of

Examination : 60% 240 Marks Internal assessment
40% 160 Marks End of the term examination

Total Marks - 400

Reading list :

- Building materials : Rangwala
- Building construction : Rangwala
- Motivate series – BC Principles and practices- D Watten
- Concrete technology: K.T. Krishna swamy, A Kanasundra Rao,
A A Khandekar
- Properties of concrete : A. M. Neville
- Material for architects and builders: Arten R Lyens

**SUBJECT: ENVIRONMENTAL SCIENCE &
SERVICES – II**
(E.S.S.-II)

*Course Code: 0432
*Semester: IV
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent: Light & sound, theory and application in building design.
Understanding of basic building services & requirement of acoustics, water supply and drainage

Content: Daylight & Natural lighting
Sunlight, its principles, radiation spectrum-visible belt & eye's sensitivity-visioning mechanics. Daylight, its source & types, its behavior-transmission, reflection. Daylight factor, its calculation, components & design skylight concept for desired lighting. Various element affecting on external-internal sky component, measuring & designing methods

Sound & Acoustics

Sound waves, its nature, power, transmission & spread pattern. Intensity of sound-output level of various activities & hearing mechanics-ear's sensitivity. Sound properties, its types, noise control & protection methods. Acoustic methods & material, designing for desired hearing

Water supply & Drainage

Water related supply systems, its type & categorization as per use. Potable & usable water's supply-storage and sewage, soil & rainwater's collection & clearance system. Components & elements of various systems, its types as per use & material. Water consumption for various activities & criteria for designing the plumbing system

Methodology: Mainly lecture base, discussions on case-studies of relative topic, market survey and product analysis, studio base exercises and application of it in design studio

Scheme of Examination: 60% 120 Marks Internal assessment
40% 80 Marks End of term examination

Total Marks : 200

Reading list: National building code of India [bureau of Indian standards]
Manual of tropical housing and building [part-1, climatic design]
Neufert architect's data [Ernst & Peter Neufert-3rd edition]
A visual dictionary of architecture [Francis D K Ching]
Textbook of sanitation [R. S. Deshpande]
Elements of public health engineering [Duggal]
Textbook of sanitary engineering [S. R. Kshirsagar]
Timesaver standards for architectural design data [Watson, Crosbie-7th edition]
Timesaver standards for architectural design data [Callender-6th edition]

**SUBJECT: ARCHITECTURAL GRAPHIC
TECHNIQUES IV**
(A.G.T.-IV) (A.C.A.-I)
(APPLICATION OF COMPUTER IN
ARCHITECTURE I)

*Course Code: 0440
*Semester: IV
*Contact Hours: 48
*Credits: 2
*Marks: 200

Intent: To understand the various basic computer bases and need of computer added design as the tool of future

Content: Detailed topics of main platform of Auto CAD-2002
Two-dimensional drawing and representation skill
Possibilities and limitations of selected mode

Methodology: Lecture, practical lab work
Exercises based to explore new age add

**Scheme of
Examination:** 100% 200 Marks internal assessment

Total Marks: 200 Marks

SUBJECT: WORKSHOP-IV

*Course Code: 0441
*Semester: IV
*Contact Hours: 72
*Credits: 3
*Marks: 300

Intent : To create a proactive mind set towards working with various materials. Design of manufacture and maintenance.

Content : Metal, Glass, Cement, Fibreglass.

Methodology: Through objective of making prototype market survey.
Alternative materials of process
Material process selection
Shop floor drawings
Manufacturing and assembling

Market Survey: Material and process metal and glass.

Scheme of Examination: 100% 300 Marks internal assessment

Total Marks - 300

SUBJECT: STUDIO V

*Course Code: 0521
*Semester: V
*Contact Hours: 192
*Credits: 8
*Marks: 800

Intent To develop a grasp on built and spatial systems of large town / small city scale (population range 5 to 10 lacs) through Interdisciplinary studio guidance exercises.

Understanding of Building bye – laws and Urban Development Plan guidelines on Land-use, densities etc.

Content Design of a multi-functional public building in the urban setting. Introduction to urban development controls, codes and bye-laws. Exercises in articulation and manipulation of programmed needs, Design methodology, criticism and evaluation of alternative concepts.

Study of an urban environment in use. Urban activities, services and construction methods, and phenomena of social utilization, growth and change shall be the focus of the study.

Methodology: Hands on...

- 3- Site survey / mapping, documentation, representation through models, sketches, photographs at different times / situations.
- 4- Lectures, Slide shows, Library ref.

Scheme of

Examination : 60% 480 Marks internal assessment
40% 320 Marks External Viva (Jury) / End of the term Examination

Total Marks - 800

Reading list :

SUBJECT: HISTORY OF ARCHITECTURE – III
(HOA – III)

*Course Code: 0522
*Semester: V
*Contact Hours: 40
(16+24=40)
*Credits: 2
*Marks: 200

Intent: *Architectural development during the medieval period
*Adaptation and evolution of ancient built forms to the new political, religious, social as well as cultural context

Content: *Byzantinian Architecture
*Medieval Europe
*Renaissance and Post Renaissance
*Islamic architecture
*Islamic India
*Precolonial and colonial architecture
*Colonial India

Methodology: *Lectures, Slideshows, Readings, Documentations, Seminars, Analytical understandings

Scheme of Examination :60% 180 Marks Internal assessments
40% 120 Marks End of the term assessments.

Total Marks : 200

Reading list: *Richard Lannoy, The Speaking Tree
*Christian Noberg Schultz, Genius Loci: Towards a Phenomenology of Architecture
*Christian Noberg Schultz, Existence, Space and Architecture
*Christopher Alexander, A Pattern Language
*Christopher Alexander, The timeless way of building
* Christian Noberg Schultz, Intensions in Architecture
*Henri Sterlin, Architecture of the world, Living Architecture series
*Percy brown, History of Indian Architecture
*Banister Fletcher, History of Architecture
*Spiro Kostof, The city Assembled

SUBJECT: STRUCTURE - V

*Course Code: 0530

*Semester: V

*Contact Hours: 48

*Credits: 3

*Marks: 300

Intent : To study various forms of surface structures and their structural behaviour.

Content : - Types of surface structures, detailed classification of stressed skin surfaces, generation of various types. General equations of regular surfaces.

Introduction to various types of shells. Structural behavior of these shells. Case studies.

- Various types of folded plate structures. General behavior and design of a Simple V type of folded plate roof.
- Introduction to membrane structures, its behaviour in general. Simple form finding method. Development of Simple forms in the laboratory and preparing scaled models. Case studies.
- Introduction to tension structures.
- Introduction to grids, planar and curved types of grids. Their structural behaviour, form finding technique for a curved grid. Development of simple forms and construction of scaled models.
- Case studies.

Methodology : Lectures, Presentations, Site visits etc.

Schedule of

Examination : 60% 180 Marks Internal assessments
40% 120 Marks End of the term assessments

Total Marks - 300

Reading list :

**SUBJECT: BUILDING MATERIALS
& CONSTRUCTION V
(BMC – V)**

*Course Code: 0531
*Semester: V
*Contact Hours: 80
(32+48=80)
*Credits: 4
*Marks: 400

Intent : To understand various finishing and furnishing materials and techniques used in interiors and exteriors

Content : **Glass:** Its history as material and use, manufacturing and types, properties and characteristics
- Applications
- Advanced technology and Innovative uses.

Fabric: history, man made and natural production, blending, characteristics and use, identification.

Gypsum, POP : Their properties and applications

Lather, Foam, Wax : Their properties and applications

Plastic and synthetic material: Their properties and applications

Surface finishes : Wallpaper, painting, rendering, flat roof finishes

Material Studies : Understanding of Interior design with focus on selection and use of materials.

Methodology : Lectures, Fieldtrips, Documentations, Workshops, Seminars, Slide shows.

Scheme of

Examination : 60% 240 Marks Internal assessments.
40% 160 Marks End of the term examination

Total Marks : 400

Reading list : - Building materials : Rangwala
- Building construction : Rangwala
- Building construction : Mackay
- Motivate series – BC Principles and practices- D Watten
- Material for architects and builders: Arden R Lyens

**SUBJECT: ENVIRONMENTAL SCIENCE &
SERVICES – III
(E.S.& S – III).**

*Course Code: 0532
*Semester: V
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent: To develop a grasp over :

1. The effect of Sun & Moon on the Earth and how by orienting & articulating built form one can optimise benefits and reduce discomforts, electrical inputs of lighting and ventilation.
2. The parameters of Comfort and Discomfort.
3. The sensorial perception / experience which can be environmentally controlled.
4. Electrical & mechanical services in building design.
5. Understanding of basic elements of services & requirements of it

Content: * Artificial lighting & Electrification
Basic electrical supply & distribution to the building, alternate supply & Power connections. Various components & elements of layouts as per use, lifesaving auto-cut circuits & other fixtures. Communication systems like fax, telecom, EPABX, alarm, audio-video monitoring, etc & their layouts. Criteria of designing of various communicating service layouts

*Mechanical circulation
Vertical transportation as per demand and distance, their categorisation. Lifts, its types, grouping, return travel time, carrying capacity, design of duct and cabin, installation, capsule-passenger-hospital-goods and garbage lifts. Escalators and elevators, their automated systems and maintenance

*Fire fighting & Protection
Study of fire fighting regulations, fire alarming & extinguishing system, fire hydrants-their types, location, spacing, distance & specifications. Fire resistance of different building materials, designing of fires resistant door, gangway, and stair & lift block for escape. Case studies of service and escape layouts of building for fire protection system & requirement

Methodology: Mainly lecture base, discussions on case-studies of relative topic, market survey and product analysis, field trips and practical derivation, studio base exercises and application of it in design studio

Scheme of

Examination: 60% 120 Marks Internal assessments
40% 80 Marks End of the term examination

Total Marks : 200

Reference: National building code of India [bureau of Indian standards]
Neufert architect's data [Ernst & Peter Neufert-3rd edition]
Timesaver standards for architectural design data [Watson, Crosbie-7th edition]
Timesaver standards for architectural design data [Calendar-6th edition]

**SUBJECT: ARCHITECTURAL GRAPHIC
TECHNIQUES V
(A.G.T.- V) (A.C.A.- II)
(APPLICATION OF COMPUTER IN
ARCHITECTURE II)**

*Course Code: 0540
*Semester: V
*Contact Hours: 48
*Credits: 2
*Marks: 200

Intent: To understand the representation and rendering technique and ability to create 3-D modelling

Content: Advance detailing as 3-D modeling
Sciography and rendering
Possibilities and limitations of selected mode

Methodology: Lecture, practical lab work
Exercises based to explore new age add

Scheme of

Examination: 100% 200 Marks internal assessment

Total Marks: 200 Marks

SUBJECT: ELECTIVE
CRAFT ELECTIVE-1

*Course Code: 054E
*Semester: V
*Contact Hours: 24
*Credits: 1.5
*Marks: 150

Intent: To develop the creative faculties of the students and equip them to understand the acts/ process of 'making ' in the various field of arts.

Content: Elective available :
1) Graphic designs, calligraphy etc.
2) Architectural Photography
3) Media Exploration
4) Textile
5) Drawing, Painting and printing
6) Material Exploration – Mud, Glass, Wood, Metal, Plastics etc.
7) Construction Technique

* The elective offered in the semester would depend on faculty availability

Methodology: Through Lecture, demonstration and excess

Scheme of Examination: 100% 150 Marks internal assessment

Total Marks: 150 Marks

SUBJECT: ELECTIVE
DESIGN ELECTIVE-1

*Course Code: 052E
*Semester: V
*Contact Hours: 24
*Credits: 1.5
*Marks: 150

Intent: To develop the Critical thinking ability of the students and equip them to understand the acts/ process of 'making ' in the various field of arts/ literature.

Content: Elective available :
1) Appreciation of literature and poetry.
2) Appreciation of Art and design.
3) Appreciation of Music/ theater/ cinema.
4) Vernacular Architecture and settlement.
5) Documenting cities
6) Urban Economics and Sociology
* The elective offered in the semester would depend on faculty availability

Methodology: Through Lecture, demonstration and excess

Scheme of Examination: 100% 150 Marks internal assessment

Total Marks: 150 Marks

SUBJECT: STUDIO VI

*Course Code: 0621
*Semester: VI
*Contact Hours: 192
*Credits: 8
*Marks: 800

Intent : Design Resolution & representation of design intent through construction documents (Architectural Working Drawings & detail drawings). Understanding the parameters of construction documents (AWD), prepare drawings for execution, co-relate and co-ordinate inputs from various consultants.

Content : Design problems on the design of closed environment, with emphasis on the articulation of interior spaces, detailing and finishing materials, textures, colour and light, acoustics and air-conditioning. Exterior spaces formed by buildings, Elevations, fenestration and built form as a moderator of urban space, site planning and landscaping.

Working drawings related to one or more aspects studied above with a view to understanding structures and services related to buildings of 3 to 5 Stories and the implications of specifications on the quality and cost of the Final architectural product.

Exposure to various system of transferring design intent to technical drawings & specifications .The various coding systems of Construction documents (AWD)

Methodology : Based on the design of earlier semester a portion or a whole is taken for further design resolution.

Lectures, Slide shows, Library ref.

Scheme of

Examination : 60% 480 Marks intermediate assessment
40% 320 Marks External Viva (Jury) / End of the term Examination

Total Marks : 800

Reading list :

SUBJECT: HISTORY OF ARCHITECTURE – IV
(HOA – IV)

*Course Code: 0622
*Semester: VI
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent: *Industrial revolution and its impact on the World architecture
*Post industrial revolution movements in art and architecture

Content: *Arts and crafts movement
*Classical revivalism
*Modern movement
*Modern Architects

Methodology: *Lectures, Slideshows, Readings, understandings

Scheme of

Examination: 60 % 120 Marks Internal assesments
40 % 80 Marks end of the term Exam.

Total Marks - 200

Reading list *Christian Noberg Schultz, Genius Loci: Towards a Phenomenology of Architecture
*Christian Noberg Schultz, Existence, Space and Architecture
*Christopher Alexander, The timeless way of building
*Christian Noberg Schultz, Intensions in Architecture
*Banister Fletcher, History of Architecture
*Spiro Kostof, The city Assembled
*Kenneth Frampton, Modern Architecture, A critical History
*Bill Risebero, Modern Architecture and Design, An Alternative History
*Robert Ventury, Complexity and Contradiction in Architecture

SUBJECT: STRUCTURE - VI

*Course Code: 0630

*Semester: VI

*Contact Hours: 48

*Credits: 3

*Marks: 300

Intent : Understanding of section design in RCC and its implication on design of structures.

Content : - Theory of composite sections applied to RCC structures. Review of properties of concrete and steel as applicable to RCC fundamental assumptions of RCC structure

- Analysis and design of singly reinforced sections, under reinforced, over reinforced and balanced sections.
- Analysis and design of one way and two way slab using coefficients and standard tables. Effects of continuity, detailing of reinforcement, provisions of IS 456. Derivation of thumb rules.
- Doubly reinforced section, effect of compression, steel on deflection.
- Introduction to and analysis of Tee beams EII beams, practical examples of both.
- Diagonal tension, its effect and methods of resisting it. Design of shear reinforcement.
- Bond and its significance, types of bond, pull out test, factors affecting bond, local and average bond, design for bond, code provisions.
- Elements subjected to axial compression, types of columns, permissible stresses in concrete and steel, analysis and design of short columns, slenderness and its effect on the bond carrying capacity, analysis and design of long columns. Columns of a multi-storey building, code provisions, derivation of thumb rule.
- Types of foundations and their use, punching shear, analysis and design of spread footings, structural behavior of other types of foundations.
- Principles and Practices of Earthquake Resistant structures.

Methodology : Lectures, Presentations, Site visits etc.

Schedule of

Examination : 60% 180 Marks Internal assessments
40% 120 Marks End of the term assessments.

Total Marks - 300

Reading list :

**SUBJECT: BUILDING MATERIALS &
CONSTRUCTION VI
(BMC – VI)**

*Course Code: 0631
*Semester: VI
*Contact Hours: 80
(32+48=80)
*Credits: 4
*Marks: 400

Intent: Overview of all construction elements, their specifications, preparation of abstract and quantity surveying.
Industrial construction systems, critical study of building in terms of construction and quantity survey.

Content:

- Large span structures
- High rise structures; modular construction
- Tools, Equipment for such construction
- Critical study of building in terms of material used, techniques followed, structural systems and services.
- Issues of coordination between them during design and construction, causes for failures on performance.
- estimating and costing of quantity with a full understanding of specifications
- valuation
- Building elements & anatomy

Methodology : Lectures, Fieldtrips, Documentations, Workshops, Seminars, Slide shows, Exercises.

Schedule of

Examination : 60% 240 Marks Internal assessments
40% 160 Marks End of the term examination

Total Marks - 400

Reading list :

**SUBJECT: ENVIRONMENTAL SCIENCE &
SERVICES – IV
(E.S. & S.- IV)**

*Course Code: 0632
*Semester: VI
*Contact Hours: 64
(32+32=64)
*Credits: 4
*Marks: 400

Intent: Mechanical thermal control & human comfort levels.
Criteria of fire fighting, protective measures & techniques

Content: H.V.A.C. [Heating, Ventilating, Air-conditioning and cooling]
Mechanical thermal controls, its type, effects of it on heating, ventilating, air-conditioning or cooling an enclosed space. Air-conditioning or cooling systems, various types in practice, chilled water cooling system-air handling package-unit & their installation, demand and consumption as per use & volume of space. Supply plants and service layouts, supply and return air's ducting and channelling systems, calculations for consumption and basic sizes of components

Landscape architecture

Methodology: Mainly lecture base, discussions on case-studies of relative topic, market survey and product analysis, field trips and practical derivation, studio base exercises and application of it in design studio

Scheme of Examination: 60% 240 Marks Internal assessments (120 Marks HVAC & 120 Marks Landscape)
40 % 160 Marks end of the term Exam.
(80 Marks HVAC & 80 Marks Landscape)

Total Marks - 400

Reference: National building code of India [bureau of Indian standards]
Neufert architect's data [Ernst & Peter Neufert-3rd edition]
Timesaver standards for architectural design data
[Watson, Crosbie-7th edition]
Timesaver standards for architectural design data
[Callender-6th edition]

SUBJECT: ELECTIVE
CRAFT ELECTIVE- 2

*Course Code: 064E
*Semester: VI
*Contact Hours: 24
*Credits: 1.5
*Marks: 150

Intent: To develop the creative faculties of the students and equip them to understand the acts/ process of 'making ' in the various field of arts.

Content: Elective available :
8) Graphic designs, calligraphy etc.
9) Architectural Photography
10) Media Exploration
11) Textile
12) Drawing, Painting and printing
13) Material Exploration – Mud, Glass, Wood, Metal, Plastics etc.
14) Construction Technique

* The elective offered in the semester would depend on faculty availability

Methodology: Through Lecture, demonstration and excess

Scheme of Examination: 100% 150 Marks internal assessment

Total Marks: 150 Marks

SUBJECT: ELECTIVE
DESIGN ELECTIVE- 2

*Course Code: 062E
*Semester: VI
*Contact Hours: 24
*Credits: 1.5
*Marks: 150

Intent: To develop the Critical thinking ability of the students and equip them to understand the acts/ process of 'making ' in the various field of arts/ literature.

Content: Elective available :
7) Appreciation of literature and poetry.
8) Appreciation of Art and design.
9) Appreciation of Music/ theater/ cinema.
10) Vernacular Architecture and settlement.
11) Documenting cities
12) Urban Economics and Sociology
* The elective offered in the semester would depend on faculty availability

Methodology: Through Lecture, demonstration and excess

Scheme of Examination: 100% 150 Marks internal assessment

Total Marks: 150 Marks

SUBJECT: STUDIO VII

*Course Code: 0721
*Semester: VII
*Contact Hrs: 16 wks
*Credits: 24
*Marks: 2400

Intent: Professional training.

Content: Office organization, client contact, exposure to brief formulation, site analysis, processes of design development, working drawings, contracts, exposure to consultants, understanding of impact costs on building design, site supervision.
Exposure to Practice.

Scheme of Examination: 50% 1200 Marks Internal assessments
50% 1200 Marks External Viva (Jury) / End of the term Examination

Total Marks - 2400

SUBJECT: STUDIO VIII

*Course Code: 0821
*Semester: VIII
*Contact Hours: 240
*Credits: 10
*Marks: 1000

Intent: Engage the students into the issues of settlements, or architecture larger than that designed for an individual household or small community.
An exposure to the socio cultural issues at an urban level wherein both the common concerns of the population and other additional aspects of their interrelations come into focus. One would also attempt to understand the basic notions of coherence, identity, sense of place and sustainability of a larger urban issue.

Content: The studio would involve a set of design exercises, to achieve the above intent tailored to the particular batch of students, their previous design exercises, and abilities to be developed.
An exercise in which all the students partake, which is broadly an Urban Design / Mass Housing problem. This would involve around 50,000 sq. mts. to 1 sq.km. of designed space, depending on the context and the targeted students abilities. This is to broadly enable all the students to deal with a larger social project and understand its implications and impacts.

There may be another set of exercises, given as a choice to students to choose from, as per their specific inclinations and skills. These would attempt to achieve a further understanding of civic issues, ecological & environmental sustainability and urban & regional planning. The attitudes to context and landscape are again looked at a larger scale.

These design problems could include:

- A. A large Urban Insert (in the form of a campus, factory/workshop or infrastructure/amenities project) involving 10,000 to 25,000 sq. mts. of intervention in a specifically urban/semi urban context.
- B. A problem of Adaptive Reuse (in the form of an older unused /partially used building, or ruins converted to another more viable usage). This would involve around 5,000 to 10,000 sq.mts. of designed space, but necessarily partially in a preexisting built environment, and partially to be allowed new.
- C. Mass housing/township: This would include the designing of a large number of habitation units and their ancillary requirements, as per the size of the whole and laws of the place. It is suggested that the project deal with no less than 500 units, and include different socio economic categories to enable an understanding of inter realities and inter relations in habitations.
- D. Any other project of comparable breadth & depth as felt required.

Methodology: Input lectures & Studio discussions with faculty.

Scheme of

Examination : 60% 600 Marks internal assessment
40% 400 Marks External Viva (Jury) / End of the term Examination

Total Marks : 1000

Reading list: Architecture of the City - Aldo Rossi.
History of the City - Leonardo Benevolo.
The Image of the City - Kevin Lynch.
The City in History - Lewis Mumford.
The City Assembled – Spiro Kostof
The City Shaped – Spiro Kostof

SUBJECT: HISTORY OF ARCHITECTURE V
(HOA – V)

*Course Code: 0822
*Semester: VIII
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent: Understanding ideas of Urbanism (to support Design Studio VIII) and the works of Late-Modernist architects in India and abroad.

Content: This course would set out the basic notion, history and theories of Urbanism, seen through examples from Urban History (both World & Indian). It would also include the study & analysis of various settlement patterns & the cities-towns that manifest them, both traditional / accretive and modern / freshly planned. The course would also cover some examples of urban projects of various architects & thinkers. This is meant as a History + Theory backing for the parallel Design Studio, that is an urban level project.

History of Architecture would then continue its chronological path with the study of ideas & works of several important architects. The focus period would be the Late-Modernist (roughly 1960's to 1980's), both abroad and in India. Importance will be given to specific trends like Regionalism & Phenomenology and their proponents in various parts of the world.

Methodology: Lectures, Slideshows, Readings, Assignments.

Scheme of

Examination: 60% - 120 marks – Internal Assessment based on term-work.
40% - 80 marks – End-of-term Examination.

Total Marks : 200

Reading:

1. Design of Cities – Edmond Bacon
2. Cities in Space – Kulbhushan & Minakshi Jain
3. The City shaped – Spiro Kostof
4. The City Essembled - Spiro Kostof
5. Urban Structure – David Lewis
6. Genius Loci – Towards Phenomenology in Architecture: Christian Noberg Schultz
7. Modern Architecture and Design: An alternative history – Bill Risebero
8. The Medieval Town – Pritz Rovig
9. The Idea of Town – Joseph Rykwert
10. Hassan Fathy
11. Geoffry Bawa
12. Louis Kahn
13. Herman Hertzberger
14. Aldo Van Eyk
15. After The Master – Indian Architects

SUBJECT: BUILDING MATERIALS & CONSTRUCTION VII

*Course Code: 0831

*Semester: VIII

*Contact Hours: 96

(32+64 = 96)

*Credits: 4

*Marks: 400

Intent: To introduce the student to advanced concepts in structural actions and detailing. It also will serve to introduce the student to the different types of structural systems available like space frames, geodesics and tensile structures. With the aid of these and other previously imbibed concepts, the student will also engage in designing some complex built environments sensitive to structural, material, technical and environmental issues.

Content: - To introduce arches, their qualitative analysis, and understand how they react with different foundation systems.
Outline of different joineries existing in steel structures, with their relative merits.
Introduction of systems like pre-stressing and post tensioning to improve the structural response of materials.
Overview of space frames, tensile and geodesic structures.
Using a few examples of built environments to illustrate the amalgamation of structures, material choices, environmental issues and technology.

Methodology: - Lectures, presentations, projects and assignments.

Scheme of

Examination: - 60% 240 Marks internal assessment
40% 160 Marks end of term assessment

Total Marks: - 400

Reading material: - Theory of structures by S. Timoshenko
Prestressed concrete by Krishna Raju
Tensile structures Vol. 1 and Vol. 2 by Frei Otto
Synergetics by R. Buckminster Fuller

**SUBJECT: ENVIRONMENTAL SCIENCE &
SERVICES V**
(E.S. & S. – V)

*Course Code: 0832
*Semester: VIII
*Contact Hours: 48
*Credits: 2
*Marks: 200

- Intent: -** Approaching a seamless integration of various knowledge bases pertaining to building services and environmental issues with built environment design.
- Content: -** Design exercises that shall bring about an amalgamation of various building services and environmental sensitivities with basic design practices.
- Methodology: -** Input sessions, discussions, formatting of knowledge base, case studies and working on studio projects.
- Scheme of Examination: -** 100% 200 Marks – Gradation on assignments and projects.
- Reading list** Magazine – Down to Earth
Engineers Handbook by R. Khanna
Other CSE publications

SUBJECT: PROFESSIONAL PRACTICE I

*Course Code: 0851

*Semester: VIII

*Contact Hours: 48

*Credits: 3

*Marks: 300

Intent : To equip students with practical aspects of the field architecture and various category of people and situations they would come across and may have to deal with, during their private practice. This would help them in getting mentally prepared to face many odds and practice more professionally and sincerely.

Content :

Section - 1: Architect as a Professional Designer.

- Architecture as a profession: short history and future directions of the profession especially in India, various avenues open after education.
- Social obligations and role of an architect and how to start the practice of architecture.
- Clientele and related roles of an architect.
- Relationship with client and professional services to be offered.

Section – 2: Quantities and Estimation:

- Importance of the subject in practice.
- Methods of Estimation as per the purpose.
- Measurements and methods of quantities.
- Preparing schedule of quantities.
- Factors affecting rates of items.
- Estimation of a small portion of a building.

Section – 3: Specifications and Tenders:

- Nature and types of specifications and their importance.
- Constituents of specifications.
- Brief specifications and application of tenders.

Methodology: The course has very diverse dimensions. Therefore though one faculty may coordinate the whole program, but various experts for different topics would be invited and their input and expertise with their practical experience would be given to the students. Some literature from various books would be suggested only as reference.

Scheme of

Examination : : 60% 180 Marks Assignments
40% 120 Marks End of term examination

Total Marks : 200

Reading list: 1. Architectural Practice in India - Madhav Deobhakta.
2. Hand book of Professional Documents – Council of Architecture
3. News letters from C.O.A.
4. Journals of I.I.A.
5. News – letters from I.I.A. and its chapters / centers.
6. Souvenirs published by I.I.A. and its chapters / centers.
7. Professional Practice – Roshan Nanavati.

SUBJECT: ELECTIVE
CRAFT ELECTIVE-3

*Course Code: 084E
*Semester: VIII
*Contact Hours: 24
*Credits: 1.5
*Marks: 150

Intent: To develop the creative faculties of the students and equip them to understand the acts/ process of 'making ' in the various field of arts.

Content: Elective available :

- 1) Graphic designs, Calligraphy, Serigraphy etc.
- 2) Architectural Photography
- 3) Media Exploration
- 4) Textile
- 5) Drawing, Painting and printing
- 6) Material Exploration – Mud, Ceramics, Glass, Wood, Metal, Plastics etc.
- 7) Construction Technique

* The elective offered in the semester would depend on faculty availability

Methodology: Through Lecture, demonstration and excess

Scheme of Examination: 100% 150 Marks internal assessment

Total Marks: 150 Marks

SUBJECT: ELECTIVE
DESIGN ELECTIVE- 3

*Course Code: 082E
*Semester: VIII
*Contact Hours: 24
*Credits: 1.5
*Marks: 150

Intent: To develop the Critical thinking ability of the students and equip them to understand the acts/ process of 'making ' in the various field of arts/ literature.

Content: Elective available :

- 1) Appreciation of literature and poetry.
- 2) Appreciation of Art and design.
- 3) Appreciation of Music/ theater/ cinema.
- 4) Urban Design
- 5) Urban Economics and Sociology
- 6) Interior Design,
- 7) Advance Computer Application
- 8) Project Management
- 9) Housing
- 10) Architectural Journalism
- 11) Sustainable Architecture

* The elective offered in the semester would depend on faculty availability

Methodology: Through Lecture, demonstration and excess

Scheme of Examination: 100% 150 Marks internal assessment

Total Marks: 150 Marks

SUBJECT: DESIGN STUDIO IX

*Course Code: 0921
*Semester: IX
*Contact Hours: 240
*Credits: 10
*Marks: 1000

Intent: To amalgamate the lessons learnt in the previous studios. To engage with design issues of a larger institution along with its external social ramifications. It also entails a student understanding and expanding a requirement brief into a valid and detailed building program and developing ones own conceptual stand and design there from. The proposal will be no less than 2500 sq. mts. of built space and no more than 5000 sq. mts., depending upon the nature of the project and its location.

Content: Design of a large institution, infrastructure/amenities project proposed by the student, either from an actual/live project, that one has come across or by proposing a new project, that is both required and viable. The student is therefore required to come prepared at the beginning with a design brief or project requirement along with an identified site. The student would spend a suggested 2 weeks on relevant case studies, site analysis and site model, and 2 weeks on program building. During the course of the term, the student would develop the brief into a detailed building program with all relevant requirements with inputs from the faculty as well as respect the byelaws and standards applicable to the chosen site. The student is expected to be able to draw from his/her entire design and other subject inputs over the previous years, evolve the conceptual premise and develop the design thereupon. The main issues will be strength of the building program, clarity of conception, development of the character of institution along with the architectural feature like forms, volumes, transitional spaces, elements and building detailing. Attitudes to context and landscape are also expected to be developed to a level require by the project and the location.

Methodology: Studio discussions with the faculty.

Scheme of

Examination: 60% 600 Marks internal assessment
40% 400 Marks end of the term Examination

Total Marks :1000

SUBJECT: HISTORY OF ARCHITECTURE VI
(HOA – VI)

*Course Code: 0922
*Semester: IX
*Contact Hours: 32
*Credits: 2
*Marks: 200

Intent: Understanding Contemporary Architecture.

Content: The final History of Architecture course takes up the immediate past (roughly 1980's to 1990's) leading upto the present time. The course will also extend to social, political and literary theory developments to understand the cause, and the thoughts, ideas and works of several contemporary architects. Several trends like Post-Modernism, Deconstruction, Hi-Tech Architecture, etc. would be touched on.

Also, significant examples of Indian architecture of the last 10-15 years would also be re-viewed and analyzed in order to take it forward; which would be a fulfillment of a study of the history of architecture.

Methodology: Lectures, Slideshows, Readings, Assignments.

Examination: 60% - 120 marks – Internal Assessment based on term-work.
40% - 80 marks – End-of-term Examination.

Total Marks : 200

Reading:

1. Meaning in Architecture – Charls Jenks.
2. Intentions in Architecture – Christian Noberg Schultz
3. What time is this space – Kevin Lynch
4. Complexity and contradiction in Architecture – Robert Ventury
5. Tadao Ando
6. Peter Eisenmann
7. After the Masters – Indian Architects

**SUBJECT: BUILDING MATERIALS &
CONSTRUCTION VIII
(BMC – VII)**

*Course Code: 0931
*Semester: IX
*Contact Hours: 96
*Credits: 4
*Marks: 400

Intent: - To create an awareness of the efficiency of shell structures and their building techniques.
To create an awareness of the latest construction techniques, material choices and technology options available.

Content: - Introduction to shells, their various types and individual merits.

Construction details of various types of membranes and shells and the material choices and structural actions governing them.

To take up and critically analyze a few structures from a structural, construction and technology perspective, and through this exercise, to create an awareness in the students of the various kinds of options open to them. This approach will also instill an idea in the student about the reasons for making different choices, and what the merit of each action is.

Methodology: - Lectures, assignments, slide shows, presentations and self study projects.

Scheme of Examination: - 60% 240 Marks internal assessment
40% 160 Marks end of term examination

Total Marks - 400

Reading material: - Plates and Shells by S. Timoshenko and Woinowsky Krieger.
Roark's Formulae for Stress and Strain
Concrete Technology by Neville
Advanced Strength of materials by Seely and Smith.

**SUBJECT: ENVIRONMENTAL SCIENCE &
SERVICES VI
(E.S. & S. – VI)**

*Course Code: 0932
*Semester: IX
*Contact Hours: 48
*Credits: 2
*Marks: 200

Intent: - Further approaching a seamless integration of various knowledge bases pertaining to building services and environmental issues with built environment design.

Content: - Design exercises that shall bring about an amalgamation of various building services and environmental sensitivities with basic design practices.

Methodology: - Input sessions, discussions, formatting of knowledge base, case studies and working on studio projects.

Scheme of Examination: - 100% 200 Marks – Gradation on assignments and projects.

Reading list Magazine – Down to Earth
Engineers Handbook by R. Khanna
Other CSE publications

SUBJECT: PROFESSIONAL PRACTICE II

*Course Code: 0951

*Semester: IX

*Contact Hours: 48

*Credits: 3

*Marks: 300

Intent : To equip students with practical aspects of the field architecture and various category of people and situations they would come across and may have to deal with, during their private practice. This would help them in getting mentally prepared to face many odds and practice more professionally and sincerely.

Content : -

Section – 1: Architect as a Professional practitioner.

- Contract between an architect and the client.
- Management of the contract and roles of an architect and the client.
- Types of architect's offices and roles of various staff.
- Employer – Employee relationship.
- Responsibility towards education.
- Professional associations, their types, purpose, role, responsibilities, activities, etc.

Section – 2: Quantities and Estimates:

- Detailed estimation and factors involved.
- Summarizing estimate and recapitulation.
- Principal material requirements related to the estimates.
- Rate analysis.

Section – 3: Specifications and tenders:

- Quality of materials and proportions.
- Quality of technical labour.
- Tests of materials and products and their acceptance.
- Structuring and writing specification.
- Tendering systems and constituents of the tender documents.

Methodology: The course has very diverse dimensions. Therefore though one faculty may coordinate the whole program, but various experts for different topics would be invited and their input and expertise with their practical experience would be given to the students. Some literature from various books would be suggested only as reference.

Scheme of

Examination : 60% 180 Marks Assignments
40% 120 Marks End of term examination

Total Marks : 200

Reading list: 1. Architectural Practice in India - Madhav Deobhakta.
2. Hand book of Professional Documents – Council of Architecture
3. News letters from C.O.A.
4. Journals of I.I.A.
5. News – letters from I.I.A. and its chapters / centers.
6. Souvenirs published by I.I.A. and its chapters / centers.
7. Professional Practice – Roshan Nanavati.

SUBJECT: ELECTIVE
CRAFT ELECTIVE- 4

*Course Code: 094E
*Semester: IX
*Contact Hours: 24
*Credits: 1.5
*Marks: 150

Intent: To develop the creative faculties of the students and equip them to understand the acts/ process of 'making ' in the various field of arts.

Content: Elective available :

- 1) Graphic designs, Calligraphy, Serigraphy etc.
- 2) Architectural Photography
- 3) Media Exploration
- 4) Textile
- 5) Drawing, Painting and printing
- 6) Material Exploration – Mud, Ceramics, Glass, Wood, Metal, Plastics etc.
- 7) Construction Technique

* The elective offered in the semester would depend on faculty availability

Methodology: Through Lecture, demonstration and excess

Scheme of

Examination: 100% 150 Marks internal assessment

Total Marks: 150 Marks

SUBJECT: ELECTIVE

DESIGN ELECTIVE- 4

*Course Code: 092E

*Semester: IX

*Contact Hours: 24

*Credits: 1.5

*Marks: 150

Intent: To develop the Critical thinking ability of the students and equip them to understand the acts/ process of 'making ' in the various field of arts/ literature.

Content: Elective available :

- 1) Appreciation of literature and poetry.
- 2) Appreciation of Art and design.
- 3) Appreciation of Music/ theatre/ cinema.
- 4) Urban Design
- 5) Urban Economics and Sociology
- 6) Interior Design,
- 7) Advance Computer Application
- 8) Project Management
- 9) Housing
- 10) Architectural Journalism
- 11) Sustainable Architecture

* The elective offered in the semester would depend on faculty availability

Methodology: Through Lecture, demonstration and excess

Scheme of

Examination: 100% 150 Marks internal assessment

Total Marks: 150 Marks

SUBJECT: RESEARCH METHODOLOGY

*Course Code: 1011

*Semester: X

*Contact Hours: 32

*Credits: 2

*Marks: 200

Intent: - Understanding basic principles of any research task with specific reference to architectural research and its application to the undergraduate level.

Content: - The nature and function of research, scientific research, meaning of research, traditional and potential areas/types, the three stages of research, research methodology, various techniques of data collection in general, specific techniques in architectural research, methods of analysis stage, communication of research reporting, the structure of a report, the necessity for the development of writing skills, technical data about formal writing the use of visuals, the qualities of research, the use of primary and secondary references, bibliography, notation, cross reference etc. Issues of selective reference. Methods of writing draft reports before finalization.

The nature of an undergraduate thesis, its structure and other requirements, research in the fields of environment, community structure, architectural history and theory, urban structure, building type studies, etc. Behavioural studies and user evaluation.

Methodology: - Input sessions and assignments.

Scheme of

Examination: - 60% 120 Marks – Gradation on assignments and projects
40% 80 Marks - End of term examination.

Total Marks - 200

SUBJECT: STUDIO X

*Course Code: 1021

*Semester: X

*Credits: 18

*Marks: 1800

Intent: It is intended throughout the course, that in addition to the technical, design & communication abilities; the student also develop a critical thinking attitude based on valid inquiry & logical structure. The tenth semester, being the final stage of the student's course, calls upon the student to engage in and present a research work that exemplifies his critical abilities & structured thought.

Content: A research thesis on a subject chosen by the student and approved by the thesis committee, of no less than 10,000 words alongwith requisite & suitable illustrations & drawings. The student comes with a proposal at the beginning of the term, and chooses a research guide either form within IPISA or with the committee agreement an external person better qualified in the subject. With the help of the guide and lessons learnt through the Research Methods element & other theoretical work during the course, the student develops the proposal into a research work of undergraduate caliber. The main issues will be validity of the hypothesis, strength of analytical structure, depth & efficacy of chapterisation points, sufficient external references, quality of illustrations requisite to the research work.

Methodology: Library research, site studies & discussions with guide
1st week – Typed proposal (500 words length)
1st Monthly review – Hypothesis & basic structure / chapterisation
Mid-term review – Full Chapterisation with One point / chapter expanded
3rd Monthly review – Bulk of the research work (including expanded chapters, illustrations-drawings)
Final review (pre-Viva) – Complete work (including Introduction, Conclusion, Credits, Captions & Bibliography in presentation format)

Scheme of

Examination: 40% 720 Marks Internal Assessment
60% 1080 Marks External Viva (Jury)

Total Marks - 1800

Reading list: To be decided by the student with the advice of the Guide depending on subject matter.

SUBJECT: WORKSHOP V

*Course Code: 1041

*Semester: X

*Contact Hours: 48

*Credits: 2

*Marks: 200

Intent: - To facilitate students present their studio X works in a comprehensible manner encompassing the basic design skills of representation.

Content: - Hand skills - mixing
Digital skills - Print Media, Digital Media
Material understanding – Upkeep, reproducibility and life.

Methodology: - Lectures, demonstrations and tutorials related to studio X works representation.

Scheme of Examination: - 100% 200 Marks – gradation on tutorials

SUBJECT: PROFESSIONAL PRACTICE III

*Course Code: 1051

*Semester: X

*Contact Hours: 32

*Credits: 2

*Marks: 200

Intent : To equip students with practical aspects of the field architecture and various category of people and situations they would come across and may have to deal with, during their private practice. This would help them in getting mentally prepared to face many odds and practice more professionally and sincerely.

Content : -

Section – 1: Architect as a professional:

- Professional role, responsibilities and liabilities of an architect.
- Ethics in profession.
- Architects' indemnity (Security against damages.)
- Management of contract between client and contractor.
- Roles of a) Client, b) Consultants, c) Contractor / subcontractors. and their coordination by the architect.
- Site supervision and roles and responsibilities of a) Architect, b) Contractor, c) Clerk of works, d) Client.
- Professional fees and expense structure.
- Tax planning.
- Development controls

Section – 2: Specifications and Contracts:

- Role of specifications in set of contract.
- Types of contracts.
- Financial and quality implications of specifications.
- Ideal and real specifications.
- Contents of contract.
- Conditions of contract.
- Obligations and responsibilities of a) Client, b) Contractor, c) Architect.
- Labour laws and obligations, insurance, deposits etc.

Methodology: The course has very diverse dimensions. Therefore though one faculty may coordinate the whole program, but various experts for different topics would be invited and their input and expertise with their practical experience would be given to the students. Some literature from various books would be suggested only as reference.

Scheme of

Examination : 60% 120 Marks Assignments
40% 80 Marks End of term examination

Total Marks - 200

Reading list: 1. Architectural Practice in India - Madhav Deobhakta.
2. Hand book of Professional Documents – Council of Architecture
3. News letters from C.O.A.
4. Journals of I.I.A.
5. News – letters from I.I.A. and its chapters / centers.
6. Souvenirs published by I.I.A. and its chapters / centers.
7. Professional Practice – Roshan Nanavati.