Study Scheme & Syllabus of
B. Architecture

Batch 2021 onwards

By

Department of Academics

IK Gujral Punjab Technical University Jalandhar

FIRST YEAR

1st SEMESTER

Course Type	S. No	Course Code	Course Title	Load Allocations					Marks %	Credits	Duration of Univ. Exam/ Viva-Voce
				L	Sem/ Tut	P/ FW	Stu	Total	Int : Ext		
PC	1	BARCH-101/21	Architectural Design & Theory-I	1	-	-	4	5	60:40	5	06 + Ext. Viva Voce
	2	BARCH-102/21	Architectural Drawing-I	1	-	-	3	4	60:40	4	3
	3	BARCH-103/21	Architectural Graphics-I	1	-	-	2	3	60:40	3	3
	4	BARCH-104/21	Workshop-I	-	-	2	-	2	100: 0	1	No Exam, only Int. jury Viva-Voce
BS&AE	5	BARCH-105/21	Building Construction & Materials-I	1	-	-	3	4	60:40	4	3
	6	BARCH-106/21	Theory of Structure- I	2	1	-	-	3	40:60	3	3
SEC	7	BTHU-101/18	Communicative English	2	-	-	-	2	40:60	2	3
	8	BTHU-102/18	Communicative Skill Laboratory		-	2	-	2	100: 0	1	No Exam, only Ext. jury Viva-Voce
	9	HSMC-122/18	Human Values and Professional Ethics	2	-	-	-	2	40:60	2	3
	10	BARCH-107/21	Life skills-I	1	-	-	-	1	S/US	NC	No Exam
	Total							28		25	

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester) 2021

Course Code	Course Name	L-1, ST-4	Int. : Ext.	Duration of Exam
BARCH101-21	Architectural Design & Theory – 1	Credits - 05	60:40	06 Hours

Course Objective:

The main objective of the course is to get the students interested in and to familiarize them with the basic concepts of Design. To enhance and promote visualization, expressional skills and sensitivity to surrounding environment and to develop the ability to translate principle of design into architecture solution.

Course Outcomes:

At the end of the course, the students will able to-

- Understand & will gain a fundamental knowledge of architecture design and its basic principles.
- To apply visual and formal analysis of architecture in their mind and they will be able to appreciate well-designed buildings.
- Understand the skill required to interpret a work of architecture and to evaluate, identify and analyse artistic expression of architectural forms.
- Understand the relationship between human activities of Space.

Detailed Syllabus:

UNIT-I (Theory)

- Introduction to Basic Design
- Objectives of Design
- Elements of Design
- Principles of Design
- Scale and proportion in Architecture.
- Anthropometrics (including norms for physically challenged persons)
- Human functions and their interactions for space requirements.
- Minimum and optimum areas for various human activities & functions.

UNIT-II (Design Exercise & Application)

- 2D compositions with basic geometric shapes, colour, texture and pattern.
- Experience in 3D Design, compositions with simple forms like cube, cuboids, cylinder, cone, prism etc.
- Compositions with 3-D Solids.
  Note - Stress is given to 2D, 3D exercise **(Black & white and colours.)**
- Functional furniture layout, circulation as anthropometric/Activity pattern

UNIT-III

- Gazebo/ rain shelter/ Milk booth/Florist kiosk/ park layout etc...

Evaluation Criteria for Exam / Question Paper Setting:

The examiner will set five questions from Unit- I and two from Unit-III & students are required to attempt any three question from Unit-I and only one from Unit-III during the six hour examination. No question to be set from Unit- II

Important Note:

The evaluation is to be done through Viva - voce conducted at the institute level by Internal / External jury members appointed in consultation with the university from the appointed panel list of examiners. The answer sheet shall be retained at the institute after the exam for the viva voce.

Instructions for the Faculty:

Design faculty should encourage and motivate the students for live projects of their immediate surrounding. (Identifying need, Framing requirements and solution for the same and it should be marked as an assignment.)

The stress should be given on making students grasp the concept and do the design assignment as a creative fun activity.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester) 2021

Course Code	Course Name	L - 1, ST - 3	Int. : Ext.	Duration of Exam
BARCH102-21	**Architectural Drawing –I**	**Credits - 04**	**60:40**	**03 Hours**

Course Objective:

The objective is to make the students familiarize with good drafting and lettering techniques use in architecture. To gain the basic knowledge for preparing the architectural drawings by learning about the orthographic projections of simple geometric forms and representation of 3-D & 2-D forms.

Course Outcomes:

At the end of the course, the students will able to –

- Gain the comprehensive understanding of the fundamental techniques of technical drawing and its architectural representation.
- Attain the knowledge to visualize the geometrical forms through plans, elevations and sections.

Detailed Syllabus:

UNIT- I

- Drafting – Technique & its Principles
- Line - Types of Lines and Dimensioning of line
- Lettering - free hand & block lettering
- Scales – Different types of scale and its uses in the Architectural Drawing.

UNIT- II

- Orthographic Projections - Point, Lines, Plane and Solid in various positions in the First Quadrant.

UNIT- III

- Section of Solids- Cube, Cuboids, Cone, Cylinder, Pyramid, Prism etc.

UNIT- IV

- Development of Surfaces - Simple Geometrical Solids (Cube, Cuboids, Cone, Cylinder, Pyramid, Prismatic)
- Interpenetration of Solids

Instructions for the Faculty:

Emphasis should be laid on learning by doing and students have to be encouraged to make proper models to understand the geometry of forms.

Evaluation Criteria for Exam / Question Paper Setting:

Total eight questions are to be set (two questions from each unit) and the students are required to attempt total four questions (one from each unit).

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same In the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester)

Course Code	Course Name	L - 1, ST - 2	Int. : Ext.	Duration of Exam
BARCH103-21	**Architectural Graphics –I**	**Credits - 03**	**60:40**	**03 Hours**

Course Objective:

The objective is to make the students familiar with visual arts and its basic principles and to explore the potential of Pencil of different grades and Coloured pencils as a powerful tool of Graphic Communication.

Course Outcomes:

At the end of the course, the students will able to –

- Gain a fundamental knowledge of architecture Graphics and its principles.
- Achieved a comprehensive understanding of architectural presentation techniques.

Detailed Syllabus:

UNIT- I (Pencil as fundamental tool of drawing)

- Free hand line-work with different strokes/grades in pencil.
- Effect of light and shade on simple geometrical solids.
- Textures of different building materials (such as bricks, stones, grass, glass, timber etc.) in pencil through shading and surface finishes of wall and floor.
- B/W Composition by using different geometric forms with charcoal pencil.

UNIT- II (Pencil as presentation medium)

- Freehand (proportionate) sketching of human figures, different types of vegetation, different transport modes and buildings etc.
- Indoor and outdoor furniture/antique items & Staircase-shading/role with light
- Sketches of scenes and activities from memory involving public spaces, markets, festivals, recreational spaces etc.
- Live sketching – indoor and outdoor area

UNIT-III (Rendering with coloured pencils/crayons/dry pastels)

- Colour rendering of human figures, different types of vegetation, different transport modes and buildings etc.
- Colour Rendering of various scenes such as Garden/Park Scene, Street Scene, Lake Scene, Village/Market Scene, etc.
- Live sketching – indoor and outdoor area
- Role of light in rendering co-relation with different shapes of geometry and some building elements.

UNIT-IV (Art & Illusion)

- Different exercises involving Logo Design, Collage making etc.
- Mural and Sculpture design in different materials like POP, Clay, ceramic/Mosaic etc.

Instructions for the Faculty:

- Workshops related to above stated units should be organised, highlighting its technique and style which can be organised indoor or outdoor. The students must be encouraged to appreciate the natural/man-made landscape and to understand the interrelationship of nature and architecture. Emphasis should be on enhancing the observation skills & aesthetics sensibility of the students.

Evaluation Criteria for Exam / Question Paper Setting:

Total four questions are to be set from all the units and students are required to attempt all the questions.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester)

Course Code	Course Name	P - 2	Int. : Ext.	Duration of Exam
BARCH104-21	**Workshop – I**	**Credits - 01**	**100:0**	**No exam only Internal viva-voce**

Course Objective:

The student will gain basic hands on experience and fundamental knowledge in carpentry, brick masonry and model making.

Course Outcomes:

At the end of the course, the students will able to –

- Gain the basics knowledge of the carpentry tools and its joints.
- Attain skill to work with different materials for making architectural model.

Detailed Syllabus:

UNIT-I 2D/ 3D composition

- Exercise in 2-D compositions (formal, informal, abstract or modern etc.)
- Block making of 3-D geometrical blocks (by choosing different forms and different materials).
- Soap carving for creating three dimensional forms in space

UNIT-II Carpentry

- Carpentry – Introduction to the types, use of carpentry Tools and various joints in Carpentry.

UNIT-III Model Making

- Model Making—making of different types of trees and other landscape elements like street lamps, pathways, plantation, water-bodies and different types of automobiles.
- Preparation of wooden base for model making.

UNIT-IV Masonry Construction

- Brick/Stone Masonry – Low height wall construction by using either bricks or stones for the understanding of various bonds, jallies etc.

Instructions for the Faculty:

- The Faculty is required to give a complete demonstration of brick work, stone work, textured & timber work and other various exterior finishes through audio-visual aids or through site visits.

Evaluation Criteria for Exam / Question Paper Setting:

In the end of the semester internal jury Viva-voce to be conducted (the jury comprises of the subject incharge and the HOD nominee)

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same In the department library, on

web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester)

Course Code	Course Name	L-1, ST-3	Int. : Ext.	Duration of Exam
BARCH105-21	**Building Construction & Materials - I**	**Credits - 04**	**60:40**	**03 Hours**

Course Objective:

- The objective is to introduce the elementary building materials and their applications. To familiarize students with construction details of various basic components of construction.

Course Outcomes:

At the end of the course, the students will able to –

- Understand the properties, types, uses and application of various building materials i.e. brick, lime, cement, mortar, sand, stones etc.
- Gain the fundamental knowledge of building Construction especially in brick and stone.

Detailed Syllabus (This subject consists of two Parts)

Part A: Building Materials

UNIT-I (Brick As A Construction Material)

- Brief introduction to mud, sand, clay, surkhi, aggregates, lime and cement etc.
- Different types of mortar like mud mortar, lime mortar, cement mortar etc.- their properties and uses
- Classification &types, uses, sizes and properties of bricks
- Cost-effective bricks, AAC blocks, Fly-ash bricks etc. – their properties and uses in construction industry.

UNIT-II (Stone As A Construction Material)

- Classification & types, uses, sizes and properties of Stone available in India
- Stone – dressing, and deterioration and preservation measures.
- Application properties and visual check for different types of stone.
- Properties and uses of artificial stone.

Part B: Building Construction

UNIT-III (Brick masonry)

- Introduction to various components of a building (sub-structure to super-structure), their structural and functional roles.
- Brick masonry –different types of bonds (English, Flemish, Rat trap, etc.) and junctions (L-junctions, T-Junctions, cross junction) of varying wall thickness (not more than 2 brick thick).
- Attached and detached brick Piers of varying thickness (~~not more than 3'-0"~~)
- Brick jalli-design and construction details

UNIT-IV (Stone masonry)

- Stone masonry of various types
- Lintels and sill level details
- Coping and threshold details.
- Arches-Flat, Segmental and Semi-circular

Instructions for the Faculty:

- The assigned Faculty is advised to undertake 2-3 site visits for better understanding of Brick/Stone bonds, Brick Jalli and different types of exterior finishes. Faculty is advised to read the preamble of the syllabus carefully.

Evaluation Criteria for Exam / Question Paper Setting:

Total eight questions are to be set two from each unit & students are required to attempt total four questions i.e. one from each unit. The distribution of marks for **Part A** (Unit I&II): **Part B** (Unit III&IV) is 12: 28 marks.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same In the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester)

Course Code	Course Name	L-2, T-1	Int. : Ext.	Duration of Exam
BARCH106-21	**Theory of Structures - I**	**Credits - 03**	**40:60**	**03 Hours**

Course Objective

Give introduction of basic principles governing structural systems. Make students understand basic properties of solids and sections, which influence their behaviour under the effect of various types of forces.

Course Outcomes:

At the end of the course, the students will able to –

1. Develop techniques for analysing forces in statically determinate structures.
2. Apply basic knowledge of Maths and Physics to solve real life problems related to structures.
3. Describe Hooke's law relationships and perform calculations

Detailed Syllabus:

UNIT I

- Various types of Gravitational and Lateral Loads (I.S. 875) such as Dead, Live, Wind, Earthquake etc.
- Type of Forces, Cause- Effect, Concurrent Forces, Coplanar Forces and Parallel Forces. Triangle Law of Forces, Parallelogram Law of Forces, Equilibrium of Forces, Concept of Resultant, Conditions of Equilibrium.
- Centre of Gravity, Definition, Centroid, Centre of Gravity of Plane Figures, Moment of Inertia; Radius of Gyration of simple cross-section of beams and columns, Theorem of Parallel and Perpendicular Areas.

UNIT II

- Classification of Frames, Type of stresses and strains, Analysis of determinate trusses by Method of Joints, Design examples.

UNIT III

- Moment of Resistance, Theory of Bending, Bending Stresses, Sectional Modulus of Rectangular and Circular Sections , bending and shear stress distribution across a section.

UNIT IV

- Types of Stresses & Strains, Hooke's law, Young Modulus, Shear Modulus, Bulk Modulus.

Instructions for the Faculty –

The student of architecture must be clear about the Basic structure design concepts.

Evaluation Criteria for Examination/ Question Paper Setting:

The examiner is required to set eight questions with minimum two from each unit. Students are required to attempt five questions with a minimum one from each unit.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester)

Course Code	Course Name	2 - L	Int. : Ext.	Duration of Exam
BTHU101-18	**Communicative English**	**Credit - 2**	**40:60**	**03 Hours**

Course Objective:

The student will gain basic hands on experience and fundamental knowledge English and become the independent users of English Language.

Course Outcomes:

At the end of the course, the students will able to –

- Have proficiency in reading & listening, comprehension, writing and speaking skills.
- Understand spoken and written English language, particularly the language of their *chosen technical field.*
- Converse fluently.
- Produce clear and coherent texts on their own.

Detailed Syllabus:

UNIT-I Vocabulary Building & Basic Writing Skills

- The concept of Word Formation
- Root words from foreign languages and their use in English
- Acquaintance with prefixes and suffixes from foreign languages in English to
- form derivatives.
- Synonyms, antonyms, and standard abbreviations.
- Sentence Structures
- Use of phrases and clauses in sentences
- Importance of proper punctuation
- Creating coherence
- Organizing principles of paragraphs in documents
- Techniques for writing precisely

UNIT-II Identifying Common Errors in Writing

- Subject-verb agreement
- Noun-pronoun agreement
- Misplaced modifiers
- Articles
- Prepositions
- Redundancies
- Clichés

UNIT-III Mechanics of Writing

- Writing introduction and conclusion
- Describing
- Defining

- Classifying
- Providing examples or evidence

UNIT-IV **Writing Practices**

- Comprehension
- Précis Writing
- Essay Writing
- Business Writing-Business letters, Business Emails, Report Writing, Resume/CV, Architectural Report Writing

Evaluation Criteria for Exam Question Paper Setting:

One objective type compulsory question to be set covering the entire syllabus in addition to eight others (two from each unit). The students are requiring attempting total 05 questions i.e. compulsory question and one from other from each unit.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same In the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester)

Course Code	Course Name	P-2	Int : Ext	Duration of Exam
BTHU102-18	**Communicative Skill Laboratory**	**Credit - 1**	**100:0**	**No exam only Internal viva-voce**

Course Objective:

The objective of the course is to help the students become the independent users of English language.

Course Outcomes:

At the end of the course, the students will able to –

- Students will acquire basic proficiency in listening and speaking skills.
- Students will be able to understand spoken English language, particularly the language of their chosen technical field.
- They will be able to converse fluently
- They will be able to produce on their own clear and coherent texts.

Detailed Syllabus:

Interactive practice sessions in Language Lab on Oral Communication:

- Listening Comprehension
- Self-Introduction, Group Discussion and Role Play
- Common Everyday Situations: Conversations and Dialogues
- Communication at Workplace
- Interviews
- Formal Presentations

Instructions for the Faculty:

- The available software/ language lab must be put to use by the students.

Evaluation Criteria for Exam / Question Paper Setting:

In the end of the semester internal jury Viva-voce to be conducted (the jury comprises of the subject incharge and the HOD nominee)

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same In the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester)

Course Code	Course Name	L-2	Int : Ext	Duration of Exam
HSMC122-18	Human Values and Professional Ethics	**Credits - 2**	**40:60**	**03 Hours**

Course Outcomes:

To help the students to discriminate between valuable and superficial in the life. To help develop the critical ability to distinguish between essence and form, or between what is of value and what is superficial, in life - this ability is to be developed not for a narrow area or field of study, but for everyday situations in life, covering the widest possible canvas. To help students develop sensitivity and awareness; leading to commitment and courage to act on their own belief. It is not sufficient to develop the discrimination ability, it is important to act on such discrimination in a given situation. Knowingly or unknowingly, our education system has focused on the skill aspects (learning and doing) - it concentrates on providing to its students the skills to do things. In other words, it concentrates on providing "How to do" things. The aspects of understanding "What to do" or "Why something should be done" is assumed. No significant cogent material on understanding is included as a part of the curriculum. A result of this is the production of graduates who tend to join into a blind race for wealth, position and jobs. Often it leads to misuse of the skills; and confusion and wealth that breeds chaos in family, problems in society, and imbalance in nature. This course is an effort to fulfill our responsibility to provide our students this significant input about understanding. This course encourages students to discover what they consider valuable. Accordingly, they should be able to discriminate between valuable and the superficial in real situations in their life.

MODULE 1. Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration.
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario.
6. Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and coexistence) rather than as arbitrariness in choice based on liking-disliking

MODULE 2. Understanding Harmony in the Human Being - Harmony in Myself!

7. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
8. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility

9. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
10. Understanding the characteristics and activities of 'I' and harmony in 'I'
11. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
12. Programs to ensure Sanyam and Health.

Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

MODULE 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship.
14. Understanding the meaning of Trust; Difference between intention and competence
15. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship.
16. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals.
17. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives.

MODULE 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfilment among the four orders of nature - recyclability and self-regulation in nature
20. Understanding Existence as Co-existence of mutually interacting units in all pervasive space
21. Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

MODULE 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
25. Competence in professional ethics:

a. Ability to utilize the professional competence for augmenting universal human order
b. Ability to identify the scope and characteristics of people friendly and eco -friendly production systems,
c. Ability to identify and develop appropriate technologies and management patterns for above production systems.

26. Case studies of typical holistic technologies, management models and production systems.
27. Strategy for transition from the present state to Universal Human Order:

a. At the level of individual: as socially and ecologically responsible architects, engineers, technologists and managers
b. At the level of society: as mutually enriching institutions and organizations.

28. Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. to discuss the conduct as an engineer or scientist etc.

READINGS:

Text Book

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010.

Reference Books

1. Jeevan Vidya: EkParichaya, A. Nagaraj, Jeevan VidyaPrakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J CKumarappa
8. Bharat Mein Angreji Raj -PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

OUTCOME OF THE COURSE:

By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction. This is only an introductory foundational input. It would be desirable to follow it up by a) Faculty -student or mentor-mentee programs throughout their time with the institution. b) Higher level courses on human values in every aspect of living. E.g. as a professional

Evaluation Criteria for Exam / Question Paper Setting:-

One objective type compulsory question to be set covering the entire syllabus in addition to ten others (two from each unit). The students are requiring attempting total 06 questions i.e. compulsory question and one from other from each unit.

Core References

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 1st Semester)

Course Code	Course Name	L-1	Int. : Ext.	Duration of Exam
BARCH108-21	**Life skills**	**Non - Credits**	**S/US**	**Non Credit**

Course Objective:

To enable students to cope with challenges of today's world and live a life which is socially and emotionally enriching.

Course Outcomes:

At the end of the course, the students will able to develop an awareness of the self and apply well-defined techniques to cope with emotions and stress. Use appropriate thinking and problem solving techniques to solve new problems

Detailed Syllabus:

UNIT- I

Decision Making

UNIT- II

Critical thinking /lateral thinking

UNIT- III

Communication and Interpersonal skills

UNIT- IV

Self-awareness and empathy, Coping with emotions and stress

Instructions for the Faculty:

Read the preamble of the syllabus & take utmost care to discuss life issues with budding architects.

Syllabus of

Bachelors of Architecture

(2nd Semester)

Batch 2021 onwards

Bachelors of Architecture

IK Gujral Punjab Technical University

2nd SEMESTER **Total Con Hr 28**

Course Type	Course Code	Course Title	Load Allocations				Marks		Credits	Duration of Univ. Exam/ Viva-Voce
			L	Sem/ Tut	P/ FW	Stu	Internal	External		
PC	BARCH-201/21	Architectural Design -II	1	-	-	4	60	40	5	06 + Ext. Viva-voce
PC	BARCH-202/21	Architectural Drawing-II	1	-	-	3	60	40	4	3
PC	BARCH-203/21	Architectural Graphics-II	1	-	-	2	60	40	3	3
PC	BARCH-204/21	History of Architecture-I	2	1	-	-	40	60	3	3
PC	BARCH-205/21	Workshop-II	-	-	2	-	100	0	1	No Exam, only Int. jury Viva-Voce
BS & AE	BARCH-206/21	Building Construction & Materials-II	1	-		3	60	40	4	3
PE	BARCH-207/21	Theory of Design- I	1	1	-	-	40	60	2	3
SEC	BARCH-208/21	Computer Application-I	1	-	2	-	60	40	3	No Exam, only Ext. jury Viva-Voce
SEC	BARCH-209/21	Mentoring & Professional Development- I	-	-	2	-	Satisfactory/Non satisfactory NO Credit			No Exam
SEC		*Educational Tour I/ Summer Training- I/Vacation Assignment-I	-	-	-	-	-	-	-	Evaluation will be done in 3rd sem
	Total		8	2	6	12			25	

*NOTE: Educational Tour of 1-2 week duration during or after the first year of studies must be undertaken and Summer Training/ Vacation assignment to be given based on BARCH-211/21. The marking of the same will done in the third semester BARCH-310/21

IK Gujral Punjab Technical University
Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	L-1, Stu-4	Int. : Ext	Duration of Exam
BARCH-201/21	**Architectural Design - II**	**Credits - 5**	**60:40**	**06 Hours + Ext viva-voce**

Course Objective
Understand the Architectural design of a small building with reference to function, form and structures.

Course Outcomes - At the end of the course, the students will be able to:
Develop a basic understanding of function, form, structure in the design of small structures. Understand & gain a fundamental knowledge of the architecture design process and its principles.

Detailed Syllabus

UNIT-I

Design of small buildings - Security check post, Bus Queue Shelter, Kiosk cum Cafes, etc. (involving circulation, form structure, and function)

UNIT-II

Architect's Office, Doctor's Clinic, Lawyer office & such similar projects of small scale (Cycle stand, E-Rickshaw stand, Taxi stand & Parking layouts, etc.)

Minimum 2 -5 exercises to be taken. (01 major, 02 minor and 02 as time problem)

NOTE - All buildings should have accessibility to the physically challenged persons as per SC guidelines.

Instructions for the Faculty –

The Basic methodology of teaching should be based on

- Library study to understand the basic functions of building and anthropometry.
- Case Study to understand the similar buildings in similar context.
- The emphasis of design should be on the space organisation and built form**.**
- Stress should be given to new thoughts/ innovation in design.

Design faculty should encourage and motivate the students for live projects of their immediate surroundings.

Evaluation Criteria for Examination/ Question Paper Setting:

One compulsory question is to be set from the entire syllabus.

The answer sheet shall be retained at the institute after the exam for conduct of the viva voce which will be conducted at the institute level by Internal / External jury members appointed in consultation with the university from the approved panel list of examiners.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University
Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	L-1, ST-3,	Int. :Ext.	Duration of Exam
BARCH-202/21	**Architectural Drawing - II**	**Credits - 4**	**60:40**	**03 Hours**

Course Objective
To make students learn the techniques to represent different objects through 3-D and developing skill for visualization of 3-D forms through isometric/axonometric views, perspective and sociography to enhance the designing skills.

Course Outcomes- At the end of the course, the students will be able to:
- Understand the fundamental techniques of technical drawing used in 3-D.
- Analyse the 3-dimensional drawings of the building with Sociography.

Detailed Syllabus

UNIT-I (Isometric/ Axonometric projections)
- Principle of Isometric projection, Isometric grid and Scale.
- Isometric /Axonometric Views of simple/complex forms.
- Fundamentals of Sociography (point, line, plane, solids etc.)
- Sociography in Plans and Elevations

UNIT–II (Perspective Drawing)
- Introduction to theory of Geometrical Perspective Drawing.
- Angular (Two Point Perspective) and Parallel (One Point Perspective)
- Perspective of different Solids and Building elements
- Sociography in Perspectives (both one point & two-point perspectives)
- Perspective of one design problem being done in semester with sociography.

Instructions for the Faculty
- The Faculty is required to give maximum examples of the perspective view to enable the students to draw the views by using thumb rules.
- Emphasis should be laid on learning by doing and students have to be encouraged to make proper models to understand the geometry of forms.

Evaluation Criteria for Examination/ Question Paper Setting:
Total four questions are to be set, two from each unit & students are required to attempt a total of two questions i.e. one from each unit. The distribution of marks for unit I: Unit II is 15: 25 marks

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same I;n the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University
Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	L-1 , ST-2	Int. : Ext.	Duration of Exam
BARCH-203/21	Architectural Graphics - II	Credits-3	60 : 40	03 Hours

Course Objective
The objective of the course in Architectural Graphics is to make the students familiar with the basic potential of Pencil and colours as a powerful tool of Graphic Communication.

Course Outcomes - At the end of the course, the students will be able to:

- Gain a fundamental knowledge of architecture Graphics and its principles.
- Attain the knowledge about the role of colours in presentation drawing and rendering techniques used in architectural design.

Detailed Syllabus

UNIT- I (Poster Colours as an effective presentation tool and its use in architecture design)

- Colour theory, Understanding colour value and intensity
- Colour Wheel showing Primary, Secondary and Tertiary colours.
- Colour Schemes & Charts showing Tints and Shades of various colours.
- Effect of colours in relief compositions.

UNIT- II

(Oil Pastels, Charcoal and watercolours as presentation medium)

- Representation of different textures in colour (brick, stone, timber, marble, glass etc.)
- Outdoor/indoor sketching of buildings, huts, group of trees, different kinds of trees/shrubs/grass with varying foliage in colours
- Colour rendering of blocks/geometrical forms, human figures, different types of vegetation, different transport modes and buildings etc.
- Rendering of drawings (Plan, elevation, 3-D views) in oil pastels and water coloured medium of one design problem being done in semester in any one medium.

Instructions for the Faculty

- Workshops related to colour rendering will also be organised, highlighting its technique and style which can be organised indoor or outdoor. The students must be encouraged to appreciate the natural/man-made landscape and to understand the interrelationship of nature and architecture.

Evaluation Criteria for Examination/ Question Paper Setting:
Total four questions are to be set, two from each unit & students are required to attempt one from each unit.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University

Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	L -2, T - 1	Int. : Ext.	Duration of Exam
BARCH-204/21	History of Architecture - I	Credits - 03	40:60	03 Hours

Course Objective

To appreciate the constraints in the Architectural design of an ancient building with reference to its function, form and structures. To make students understand how different Architectural solutions were evolved(in successive historic periods)within the limitations imposed by prevalent social and religious customs, available building materials, climate of region/topography, complex structural problems and the limited technology available at that time period.

Course Outcomes: At the end of the course, the students will be able to –

- Developing a holistic approach to architecture is an integral component of the built environment.
- Develop an understanding of architecture as an outcome of various social, political and economic influences and as a response to the cultural and climate conditions.
- Understand the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture.

Detailed Syllabus

UNIT-I

- Introduction, Definition and scope & importance of History of Architecture - Man's early/ prehistoric attempts to colonise and personalise space by taking the examples of early shelters, Stonehenge, tumuli etc. As an expression of man's physical and spiritual needs.
- Introduction to the river valley civilizations- the Origin and the Form of the civilization.
- Architecture and town planning of Harappan civilization such as towns of Lothal, Mohenjo- Daro, Dholavira, Kalibanga etc.

UNIT-II

- Understanding of Vedic architecture, and settlements.
  The Vedic village-Building typology and its construction details.
- **Buddhist Art and Architecture**: Beginning & origin of Buddhist architecture and the important Socio-political factors in selection of sites. Architectural examples of Mahayana and Hinayana Buddhism; Rock-cut and free standing. Study of caves, stupas, and viharas of places like Sanchi, Amravati, Karle, Ajanta etc.

UNIT-III

Introduction to architecture and planning of river valley civilizations of ancient Egypt, Mesopotamia. Study of palace, hypostyle hall, temple, tomb architecture.

Nile Valley Civilization

Salient building types: (Egyptian)

- Mastabas – development and typical components
- Pyramids –development and typical components , Complex of Zoser, Pyramid of Cheops and Cephren, Standard mortuary complex layout of pyramids
- Temples & temple complexes - Cult Temple and Mortuary Temple

Mesopotamian civilization

Salient building types : (Mesopotamian)

- Ziggurats and their development – White Temple, Ziggurat of Ur, Ur Nammu and Khorsabad
- Generic Temple Layout - Temple Oval and Khafaje
- Palace Complex/Citadel of Khorsabad

UNIT-IV

Introduction to architecture and planning of ancient Greece and Rome. Study of principles of design, proportion, optical corrections and classical orders.

a) **Greek Architecture:-** Classical Order – Doric, Ionic, Corinthian
   Salient building types:
   - Temple types on basis of column layout – case example of Acropolis, Athens
   - Public Buildings and Square – Agora, Stoa, Theatres

b) **Roman Architecture: -** Contribution in new materials and new construction/structural systems, eg, Pozzolana, Cementae, Stone Blocks, Stone Masonry, Arch, Vault, Dome.

   Salient buildings types:-
   Pantheon, Colosseum, Bath of Caracalla, Basilica of Trajan, Forums of Rome, Aqueduct

Instructions for the Faculty:

- The Faculty is advised to consider limited examples (not more than 05) of each type of Architecture emphasizing on the analysis of architecture style/building typology must include the functional, constructional/structural and ornamentation aspects.
- Educational trip will be organised to impart practical knowledge of the content.

Evaluation Criteria for Exam / Question Paper Setting: -

The examiner is required to set eight questions with minimum two from each unit. Students are required to attempt five questions with a minimum one from each unit.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University
Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	P - 2	Int. : Ext.	Duration of Exam
BARCH-205/21	**Workshop - II**	**Credits-01**	**100**	**No Exam only Internal Viva-voce**

Course Objective
The student will gain basic hands on experience and fundamental knowledge in model making, sculpture and clay modelling.

Course Outcomes: At the end of the course, the students will able to--

- Proficiency in handling clay as a material.
- Acquire skills in different types of architectural model making using various materials and get hold of skill in sculpture making in various mediums.

Detailed Syllabus

UNIT-I (Clay & Sculpture)

- Clay Modelling, Pinching, Coiling Techniques Slab Techniques
- Sculptures in Plaster of Paris, Wires, Scrap, Wood, Ceramic tiles etc.

UNIT-II (Product design)

- Design & Model Making of Furniture, Lamp shades and other Interior & Exterior Elements.

UNIT- III (Model Making in paper, cardboard and mount board)

- Prepare block model of the design project introduced in the semester along with site plan details such as parking area, green areas and landscape techniques etc.
- To prepare a detailed model of mixed materials for a major design project of one design problem being done in semester.

Instructions for the Faculty

- The Faculty is required to organize one or two Sculpture/Mural workshops to enable the students to understand the concept of "learning by doing".

Evaluation Criteria for Examination/Question Paper Setting
In the end of the semester internal jury Viva-voce to be conducted (the jury comprises of the subject incharge and the HoD nominee)

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University
Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	L-1, ST-3,	Int. :Ext.	Duration of Exam
BARCH-206/21	**Building Construction & Materials - II**	**Credits-4**	**60:40**	**03 Hours**

Course Objective

The main objective is to introduce the properties of timber as building material and to familiarize the students with traditional construction methods of a single storeyed building in timber with sloping roofs.

Course Outcomes: At the end of the course, the students will be able to-

- Comprehend timber as a building material and its application in building components and gain knowledge on construction of Door, window, roof made out of it.
- Understand various surface finishes for single storey building and the fundamental knowledge for water proofing details in simple structures.

Detailed Syllabus (This subject consists of two Parts)

Part A: Building Materials

UNIT-I (Materials)

- Timber: Sources of timber, its classification & characteristics, defects of Timber, different Preservation and treatment measures and Uses of Timber in building construction.
- Industrial timber products and their applications-plywood, particleboard, laminated board, block board and batten board etc.

UNIT – II (Waterproofing and Surface finishes)

- Water proofing: - Water proofing materials (liquid, semi liquid and solid) – Composition, Properties, Applications.
- Surface finishes: -White wash, Distemper, Paints and Varnishes- Types, Applications, Suitability, Advantages and Disadvantages.

Part B: Building Construction

UNIT – III (Doors & Windows)

- Doors -Types of Doors, Design and construction details of Framed, Ledged, Braced & Battened Door, Flush Door, and Wire mesh Door, Panelled Door etc. (considering different types of Joints and Joinery details)
- Windows - Types of Windows, Design and Construction details of Casement, Bay, Clearstory, Corner window Dormer window etc. (considering different types of Joints and Joinery details)

UNIT – IV (Foundation, Walls and Roofs)

- Foundation – introduction and importance of foundations, Types of Foundations (brick and stone) and their design considerations for load bearing structures.
- Damp proof course – introduction and types of D.P.C., laying and maintenance of D.P.C. layers Roofs - Construction of R.B.C. roof, Jack Arch Roof, Tiled and Battened Roof and concepts of water proofing & Thermal Insulation of roofs.
- Section through a single storey building covering the foundation, D.P.C. layer, window with sill and lintel level, roof and wall junction, roof insulations and parapet wall details.
- Walls- various types of timber frame walls with details of joints and cladding
- Dhajji wall construction
- Foundation of timber post

Instructions to the Faculty

- The faculty should encourage the students to visit the construction site/conduct market survey w.r.t. the topics covered in the class.
- Audio-visual lectures should be presented.

Evaluation Criteria for Examination/ Question Paper Setting:

Total eight questions are to be set, two from each unit & students are required to attempt a total of four questions i.e. one from each unit. The distribution of marks for **Part A** (Unit I&II): **Part B** (Unit III & IV) is 12: 28 marks.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same I;n the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University
Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	L-1 T-1	Int. : Ext.	Duration of Exam
BARCH-207/21	Theory of Design - I	Credits -2	40:60	03 Hours

Course Objective

The objective is to establish the role and importance of Theory of Design as a broad, comprehensive activity to help students to formulate a responsible opinion and a well-reasoned judgement by looking at the design in depth and in a critical way.

Course Outcomes: At the end of the course, the students will able to-

- Develop a basic understanding of spatial organisation
- Learn about the inter-dependence of function, structure and form in architectural design. .

Detailed Syllabus

UNIT-I

- Primary Elements of Design such as Point, Line, Planes and Volume with building examples.
- Proportion, scale, balance, rhythm, symmetry, hierarchy, pattern, axis with building examples
- Formal Collision of Geometry and Articulation of Forms.

UNIT-II

- Organization of Form and Space.
- Spatial relationships; space within space, interlocking space, adjacent space, space linked by common space.; influencing factors for spatial organization and their types; centralized, linear, radial, clustered etc.

UNIT – III

- Analysis and classification: space usage & inter-relationship of different spaces within a building.
- Form defining Space with Horizontal Elements and Vertical Elements.
- Spatial Organization and Circulation Elements including Approach, Entrance, Configuration of the Path (Path- Space Relation, Form of the Circulation Space).

UNIT – IV

- Proportion and Scales, Proportion System, Visual Scale and Human scales, scalar comparison.
- Aesthetic principles in Indian and western cultures.

Instructions for the Faculty

- The Faculty is required to guide the students with building examples (taken from Indian/world architecture) to understand the necessary relationship between indoor and outdoor space in context to the theory of design and must encourage the students to do in depth study of design theory.
- Audio-visual lectures should be presented and the subject must be taught in coordination to site visits or study tour for topics relating to theory of form, space and basic architectural forms.

Evaluation Criteria for Examination/ Question Paper Setting:

The examiner is required to set eight questions with minimum two from each unit. Students are required to attempt five questions with a minimum one from each unit.

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus.

IK Gujral Punjab Technical University
Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	L-1 P-2	Int. : Ext.	Duration of Exam
BARCH-208/21	Computer Applications - I	Credits -2	60:40	No Exam, only Ext. jury / Viva-Voce

Course Objective: To make students aware of the role and importance of Computers in the field of Architecture.

Course Outcomes: At the end of the course,the students will be able to understand basics of Computers hardware, operating systems and operative languages, being a fundamental course the students will be introduced to the basics of hardware and software. They will be introduced to 2D presentations.

Detailed Syllabus: - Being an advanced learning course, students will be introduced to 2D drawing and rendering techniques.

UNIT- I

- Introduction to MS Office tools (PowerPoint presentation, word file/excel etc.)-basic templates for creating text documents, editing, formatting, spelling/grammar check, dictionary and thesaurus, page layout, fonts, indentation, inserting tables and images, document review and annotation in software like MS Word.
- Image processing: basic image sourcing, editing and insertion for desktop publishing in Adobe Photoshop or similar software.

UNIT- II

- Basic commands like copy, paste, stretch, offset, move fillet, extend, trim and other 2D commands.
- Basic Text writing and dimensioning of the Plans, Elevation and Sections.
- Basic hatching and filling of the Walls in the Plans, Elevations and Sections.
- Understanding of unit settings, scale, limits, line type, line weight, layers, colours, and print commands.
- Simple exercises in to 2D CAD software (AutoCAD/Revit) specifically for proficiency of, drawing/editing objects, text, dimensioning, making and inserting blocks,
- Drawing the basic Plans, Sections, and Elevations
- Basic rendering in the Auto Cad and in other Software's in 2D..

Evaluation Criteria for Exam

The evaluation of students shall be based on practical conducted based on a specific problem given to know the student's understanding of the computers in the field of Architecture.

Instructions for the Faculty –

Emphasis should be laid on developing the skill of 2-D drafting on the Software's

Core References:

The assigned Faculty is required to provide updated references/E-resources related to the content of the subject by ensuring the availability of the same in the department library, on web portals/online i.e. E-learning. The Faculty is also advised to keep on updating the reference list and submit the latest one in the Library & Academic department of the Campus

IK Gujral Punjab Technical University
Bachelor of Architecture (B. Arch. 2nd Semester)

Course Code	Course Name	P/FW-2	Int. : Ext.	Duration of Exam
BARCH-209/21	**Mentoring & Professional Development-I**	**Non-Credit**	**S/US**	**No Exam**

Guidelines regarding Mentoring and Professional Development

The objective of mentoring will be development of

- Overall Personality
- Aptitude (Technical & General)
- General Awareness (Current Affairs & GK)
- Communication Skills
- Presentation Skills

The course shall be split in two sections i.e. class activities and outdoor activities for achieving the above suggestive list of activities to be conducted are:

Part A (Class Activities)

- Expert and video lectures
- Aptitude Test
- Group Discussions
- Quiz (Technical & General)
- Presentation by the Students
- Team Building Exercises

Part B (Outdoor Activities)

- Sports: NSS/NCC
- Society activities in various student chapters i.e. NASA, ISTE, SCIE, SAF, CSI, Various Clubs such as Cultural, Hobby, Adventure etc.

Evaluation shall be based on rubrics for Part A & B

Mentors faculty incharge shall maintain a proper record student wise of each activity conducted and the same shall be submitted to the department.

IKG PUNJAB TECHNICAL UNIVERSITY

BACHELOR OF ARCHITECTURE – 2021 SCHEME

3rd Semester Study Scheme

TOTAL CREDIT – 26
TOTAL CONTACT HOURS- 27

Course Code	Course Name	Contact Hours				Total Marks		Credits	Univ. Exam (Hours)
		L	S	T	P	internal	external		
BARCH301-21	**Architectural Design- III**	1	4	0	0	60	40	5	06 +Ext Viva Voce
BARCH302-21	**Architectural Presentation -I**	1	1	0	0	100	0	2	No Exam
BARCH303-21	**History of Architecture- II**	3	0	0	0	40	60	3	03
BARCH304-21	**Building Construction - III**	1	3	0	0	60	40	4	04
BARCH305-21	**Structure Design- I**	2	0	1	0	40	60	3	03
BARCH306-21	**Structure System -I**	2	0	0	0	100	0	2	No Exam
BARCH307-21	**Theory of Design- II**	2	0	1	0	40	60	3	03
BARCH308-21	**Climate and Architecture-I**	2	0	0	0	40	60	2	03
BARCH309-21	**Computer Application- II**	1	0	0	2	60	40	2	No Exam
BARCH310-21	**4 week Summer Training**	0	0	0		50	0	S/NS	Non Credit
TOTAL		**15**	**8**	**2**	**2**			26	

03rd Aug 2022

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH301-21	**Architectural Design - III**	1	4	60	40	5	06 Hours + Ext viva-voce

Course Objective: To make students understand and appreciate the constraints in the designing of a building of a small scale with reference to function and form and to create awareness about the role and Importance of physical factors in Architectural Design. Study of climatic conditions of the site and aesthetics along with spatial attributes like orientation, ventilation, adequate protection from natural elements, and human dimensions in various postures (in applied form), their relation to everyday utilities including table, chair, bed etc.

UNIT-I: Single family user/ Small cluster user

Design of House, Primary School, without urban regulatory controls with emphasis on environmental and local ecological issues.

UNIT-II: Multiple user/Multiple Functions

Design of Post Office, Health Centre/ Dispensary, Community Centre, Restaurant etc.

Course Outcomes:

At the end of the course, the students will able to understand the nuances of house, school, cafeteria and post office design. They will also be well versed with various physical factors of architecture design and is able to take design decisions by considering various aspects of designs.

Teaching Methodology

Minimum two projects/ assignments to be handled by the students individually. Library and prototype studies should be carried out for other projects in groups. Model and perspective should be made integral part of project presentation. Stress should be laid on the understanding the basics of process of design.

Guidelines for Paper Setter

- One compulsory question is to be set from the entire syllabus.

Evaluation Methodology

- Evaluation is to be done through viva voce by external jury appointed by the college.
- Answer sheets should be retained at college level for the viva voce examination.
- The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.

References:

- Ching, Frank D.K., "Architecture: Form, Space & Order", John Wiley, Hoboken,2007.
- Parmar, V.S., "Design Fundamentals in architecture", Somaiya Pvt. Ltd, Mumbai,1997.
- Vandyke, Scott., "From Line to Design", Van Nostrand Reinhold,1990.
- Scott, Robert Gillam., "Design Fundamentals", Robart E. Krieger, 1980.
- E&OE., "Architects Hand Book and Planning", llife& Sons Ltd, 1963.
- Watson, Donald, Crosbie, Michael J., "Time-Saver Standards for architectural design", McGraw- hill education, 2001.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH302-21	**Architectural Presentation - I**	1	1	100	-	2	No Exam. Internal Viva Voce

Course Objective: To learn and apply various rendering techniques in Architectural Design & visual composition and to appreciate the role of presentation techniques. The focus of this subject will be more on hand oriented presentation techniques and skills.

UNIT-I: Calligraphy and Hand writing Skills

Calligraphy stroke writing in various fonts and various sizes.

UNIT-II: Interior Rendering

Render a scene of interior of a house/office/ restaurant/factory with any medium giving tints and tones and lighting effects. Single medium or Multiple medium presentation.

UNIT-III: Exterior rendering

Render a scene of Exterior of a house, Office building, playground, Market, railway station, airport station with any medium giving tints and tones and lighting effects. Single medium or Multiple medium presentation.

UNIT-IV: Live sketching

Outdoor live sketching of any institutional building/office building/historical building nearby or market places which enrich the students with understanding of scale and proportion. The students must be encouraged to appreciate the natural/man-made landscape.

Course Outcomes:

At the end of the course, the students will be able to gain a fundamental knowledge of architecture Graphics and its principles. Attain the knowledge about the role of colours in presentation drawing and rendering techniques used in architectural design.

Teaching Methodology

Workshops related to architectural rendering should be organized, highlighting its technique and style which can be organized indoor or outdoor. The students must be encouraged to appreciate the natural/man-made landscape and to understand the interrelationship of nature and architecture

Guidelines for Paper Setter

No Exam

Evaluation Methodology

- Portfolio Submission at the end of semester and internal jury

References:

- Rendering with pen and Ink
- Vandyke, Scott., “From Line to Design”, Van Nostrand Reinhold,1990.
- Scott, Robert Gillam., “Design Fundamentals”, Robart E. Krieger, 1980.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial/ Studio	int	ext		
BARCH303-21	**History of Architecture-II**	3	0	40	60	3	03 Hours

Course Objective: To appreciate the constraints in the Architectural design of an ancient building with reference to its function, form and structures. To make students understand how different Architectural solutions were evolved (in successive historical period) within the limitations imposed by prevalent social and religious customs, available building materials, climate of region/topography, complex structural problems and the limited technology available at that time period.

UNIT-I: Hindu Architecture

Early Hindu Architecture: Hindu temple Architecture: Gupta Period (A.D350-650), Chalukyan Architecture (A.D. 450-650), at Aihole, Badami and Pattadakal, Evolution of temple form, Rathas at Mahabalipuram,

Dravidian Architecture: Development of Settlement pattern and worship places. Study of Worshipping places of Dravidian Architecture -Chalukyan Phase (A.D. 600-750), Pallava(A.D. 600-900), Choloas (A.D. 900-1150) Pandyas (A.D1100-1350), Vijanagara (A.D.1350-1560) and Madurai (A.D.1600) etc.

UNIT-II: Islamic Architecture

Architecture of Imperial Style or Delhi Sultanate: Mosques, Tombs and secular buildings: The Qutb Complex: Quwwat-UI-Islam Mosque, Qutb-Minar, Tomb of Iltutmish, extensions and additions by Allaudinkhilji.

Arhai Din Ka jhompra, Khirkee Masjid, Jamaat khana Masjid, Sultan Ghari, Tombs of Ghiyasuddin Tughlaq, Firoz Shah Tughlaq, Balban, SikanderLodhi. Firoz Shah Kotla

UNIT-III: Islamic Architecture

Architecture of Provisional Style: Advent of Islam and its influence in India leading to the Indo-Islamic Style. Evolution of the Mosque & the Tomb design of Jaunpur, Mandu, Sher Shah Suri at Sasaram. Ahmedabad.

UNIT-IV: World Architecture

Early Christian Architecture: Study of Architecture Characteristics and evolution of church form, building typology and building elements. Early Basilica of St. Peter Rome.

Byzantine Architecture: Study of Architecture Characteristics and evolution of church form, building typology and building elements. Pendentive domes construction and church of Hagia Sophia and construction of arches

Romanesque Architecture*:* Study of Architecture Characteristics of Romanesque Period mainly of Italy, France and Central Europe. Focusing evolution of church form, building typology and building elements. Pointed Arches, Criss Cross arches

Course Outcomes:

At the end of the course, the students will be able to developing a holistic approach to architecture as an integral component of the built environment. Develop an understanding of architecture as

an outcome of various social, political and economic influences and as a response to the cultural and climate conditions. Understand the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture
Teaching Methodology
For each period, stress is to be laid on the Architectural character and elements of Architecture with only one or two representative examples to highlight these features. Emphasis should be laid on understating of evolution of buildings and form. Continuous evaluation shall be made of students work based on various models, assignments and sketching
Guidelines for Paper Setter
• One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus. • Two questions are to be set from each part and students would be required to attempt minimum one question from each part • Student would be required to attempt five questions in all including compulsory question. • Question paper is to be set covering entire syllabus by making parts and mixing the topics.
Evaluation Methodology
References:
• Fletcher, Banister., "A History of Architecture", University of London, The Antholone Press, 1986. • Fergusson, James., Willey, John, "A History of Architecture", Low Price Publication, 2012. • Fergusson, James., Willey, John, "History of Indian & Eastern Architecture", Saraswati press, 2012. • Tadgell, Christophe., "The History of Architecture in India", Phaidon Press,1994 • Percy Brown., "Hindu and Buddhist Period" • Percy Brown., "Islamic period"

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH304-21	**Building Construction- III**	1	3	60	40	4	04 Hours

Course Objective: To develop a fundamental understanding of basic building elements, their functions and behaviour under various condition with specific reference to brick masonry construction. To understand basic principles of R.C.C construction with respect to cantilever slab and staircase To introduce students to flooring and cladding details

UNIT-I: Masonry Structure Double Story

Section of a Double Storied Building: Section of a double storied building through Toilet and Stair case showing the details of Foundation, D.P.C, Floor, Window, Lintel, Chhajja, R.C.C Roof, Terrace and Parapet

UNIT-II: Staircases-RCC

Types of Staircases- RCC only :Design and detailing of RCC staircases. Various types of Staircases in RCC, simply supported and cantilever staircase. Form work and Railing details for RCC Staircase.

UNIT-III: Form work and Shuttering

R.C.C. Form work and Shuttering: R.C.C. Form work and Shuttering details for- Column square, round, rectangle and hexagon. RCC form work for Slab and Beam, Wall, Staircase and basement etc.

UNIT-IV: Flooring and Cladding

Flooring and Cladding*:* Construction of PCC, Terrazzo, (Cast-in-situ and tiles) and various types of Stone flooring, tile flooring and Contemporary floor must also be studied.
Cladding of interior and exterior facades in various commonly used materials like tiles, stones,

Course Outcomes:

At the end of the course student will expand a basic knowledge about building elements and construction techniques of R.C.C. staircases, shuttering of Columns, Beams and slab in R.C.C. and also develop the understanding of flooring and cladding details.

Teaching Methodology

Site Study of scaffolding and shuttering is to be conducted. Emphasis should be laid on making students understand complete construction details of double-storied structure. Field visit to study the complete process of lying of reinforcement and concreting. Preparing Construction sheets on above topics

Guidelines for Paper Setter

- Two questions are to be set from each part and students would be required to attempt minimum one question from each part.
- Students would be required to attempt four questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Mitchel,G.A., “Elementary Building Construction”, B T Batsford Ltd, London , 1961.
- Punmia B.C., “Building Construction”, Laxmi, 2016.
- .Mckay, W.B., “Building Construction (Vol 1-4)”, Longmans, U.K 1981.
- Barry, R., “Construction Of Buildings (Vol. 1-4)”, Oxford: Blackwell Scientific, 1999.
- Chudley, R., “Construction Technology (Vol. 1-4) Longmans”, Uk 1981.
- Ching, Frank D.K., “Building Construction Illustrated”, John Wiley, New York 2003

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH305-21	**Structure Design - I**	2	1	40	60	3	03 Hours

Course Objective: The aim and objective of the course on structure design-I is to get introduced to basic structural members in masonry and timber, to give knowledge of design of timber beams in buildings and to enable understanding of basic concepts of shear force and bending moment.

UNIT-I: Masonry Foundation and Retaining wall

Design of Foundations in Masonry work-- Safe Bearing Capacity, Load on Foundations, Depth of Foundation, Rankine's formula, Footing Sections.
Design of Retaining Walls in Masonry-- Loads, Resultant Pressure, Stability of Structure, Middle Third Rule, Design examples.

UNIT-II: Analysis of Frame

Bending Moment/ Shear Force, Type of Supports, Loads and Beams, BM and SF diagram for Simply Supported Beams with Point Load and Uniformly Distributed Load--Design examples

UNIT-III: Frame design

Design of Simple Timber Beam, Bending Stress Check, Shear Check, Deflection Check, Bearing Check, Design examples with UDL and Concentrated load.

UNIT-IV: Portal Frame

Analysis of portal frame by slope deflection method (Non-sway)

Course Outcomes:

At the end of the course, the students will able to Design timber beams by applying codal provisions, Design Masonry foundation and retaining walls, Analyse indeterminate structures and to calculate shear force and bending moment in determinate structures.

Teaching Methodology

- Structural design shall be supplemented by structural drawings.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Bansal, R. K., “Engineering Mechanics & Strength of Materials Publisher”, Laxmi Pvt Limited, 1998.
- Rao, K.L., “Applied Mechanics”, McGraw hill education.
- Mehta, J. C., “Applied Mechanics”, New Asian, 1963.
- Timoshenko, Stephen., “Strenth of Materials”, Krieger, 1976

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH306-21	**Structure System -I**	2	0	100	0	2	No Exam

Course Objective: To make students learn basics principles of structure systems with emphasis on learning by doing and making 3-D models to provide the student with different spatial experience.

UNIT-I: Cellular Structure System,

Cell as a natural unit of space, Cell transformation, Polygonal Cellular Systems leading to evolution of Geodesic Domes. Understanding the geometry of Platonic Solids and its duality in nature. Applications of Cellular System in Building.

UNIT-II: Bulk Active Structure System

Structure acting mainly through material bulk and continuity i.e. Bulk active structure system / structure systems in bending involving: Slabs (One way & Two way), Beams (Simply supported, Cantilever, Continuous, Vierendeel Girders), Columns, Grid (Skew & Square Grid)

UNIT-III: Vector Active Structure System

Structures acting mainly through Composition of Compression and Tension members such as, Space frames, Trusses (Timber & Steel), Domes (Ribbed & Geodesic)

UNIT-IV: Application of Structure System in Architecture

Application of platonic solids. Application of bulk and Vector active structure system in the building by making different models.

Course Outcomes:

At the end of the course, the students will be able to gain ability to comprehend the Design erection process and application of large span structures. To understand the need and importance of prefabricated components and structures as an alternative to cast in situ construction process. To understand the needs, requirements, and selection for various types of structures systems.

Teaching Methodology

Emphasis shall be on making students understand the principles and systems involved in various topics. The students should be made to Coordinate the fabrication of at least four models to demonstrate the various structural system. Students be encourage to visit Pragati Maidan & other Building centres in New Delhi for better exposure. Students be encourage to present a PPT on the topics assigned and submit its report for external evaluation.

Guidelines for Paper Setter

No Exam

Evaluation Methodology

Evaluation is through Internal Viva Voce of the work done by the student during the end of semester with internal faculty and HOD Architecture/Principal.

References:

- Critchlow. Keith., “Order in Space”
- Richard K.Thomas ., “Three Dimensional Design”
- Engel H, “Structure Systems”
- Salvadori Mario, “Building of Building”
- Butler Robert B, “Architectural Engineering Design: Structural Systems”
- Schierle G G, “Architectural Structure”
- Moore Fuller, “Understanding Structure”

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH307-21	**Theory of Design- II**	2	1	40	60	3	03 Hours

Course Objective: To understand different design processes and strategies that can be applied in Architecture and to introduce students the development in architecture with specific reference to form, technology and ornament

UNIT-I: ***Pre industrial and Industrial revolution***

Pre industrial and Industrial revolution: Neo Classical and Pre-Industrial, Developments and building examples from Italy. Industrial Revolution and its impact on the development of new towns. e.g. Tony Garnier's Industrial city. Influence of new construction materials, industrial techniques and functional needs on building typology and architectural form through building examples.

UNIT-II: ***Early modern movement and Art Nouveau***

Early modern movement and Art Nouveau: Advances in steel construction like the Great Exhibition. Modern Architecture up to Second World War. Development of the high-rise building. Chicago School of Architecture (1880-1910)- Dankmar Adler and Louis Sullivan. Art Nouveau Architecture (1890-1920) - Antoni Gaudi, Joseph Maria Olbrich. International style and expressionist.

UNIT-III: Master Architects

Walter Gropius : Philosophy and Buildings with Minimum 4- 5 famous works of different era
Frank Lloyd Wright : Philosophy and Buildings with Minimum 4- 5 famous works of different era

UNIT-IV: Master Architects

Le- Corbusier India and abroad: Philosophy and Buildings Minimum 4- 5 famous works of different era. The works in India should be given preferences.
Ludwig Mies van der Rohe: Philosophy and Buildings Minimum 4- 5 famous works of different era

Course Outcomes:

Student will able to understand the architecture as formal, stylistic and structural development.

Teaching Methodology

Study of Master Architect shall focus on his life, approach, philosophy and Architectural works including character and elements of Architecture developed with representative examples to highlight those features. Emphasis should be laid on understating of evolution of buildings and form. Continuous evaluation shall be made of students work based on various assignments and sketching.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.

- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics specially form Unit -III and Unit -IV.

Evaluation Methodology

References:

- Ching, Frank D.K., "Architecture: Form, Space & Order", John Wiley, Hoboken,2007.
- Baker,GeofferyH.,"Design strategies in Architecture", Taylor & Francis,1996.
- Global Architecture (ADA Aditia Tokyo) Vol - 2, 3 & 4.
- Fletcher, Banister., "A History of Architecture", University of London, TheAntholone Press, 1986.
- Spaeth,David.,"Mies Vander Rohe", Rizzoli, 1988.
- Storrer,WilliamAllin., "The Frank Lloyd Wright Companion"University of Chicago, 2006.
- Larkin,David, Brooks, Bruce., "Frank Lloyd Wright- The Masters Works",Rizzoli, 2000.
- Brooks,H.Allen., "The Le Corbusier",Princeton University, 1987.
- Atlas, Phaidon., "20th Century World Architecture", Phaidon,2012.
- Cohen, Jean-Louis., "The Future of Architecture Since 1889", Phaidon, 2016.
- Sembach , Klaus-Jürgen., "Art Nouveau", Taschen, 2007.
- Droste, Magdalena., "Bauhaus", Taschen,201

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH308-21	**Climate and Architecture- I**	2	0	40	60	2	03 Hours

Course Objective: To acquaint the students and make them aware of the concept of climate as a significant determinant of built forms and to familiarize them with various climate control devices.

UNIT-I: Introduction to Climatology

Fundamentals of Climatology, Introduction to climatology, Importance of studying Building climatology, Elements of climate, Global climate factors, Interrelationship of climatic elements and Psychometric chart.

UNIT-II: Thermal Comfort for Human

Thermal Comfort, Definition and explanation of Thermal Comfort, Human Heat Balance and Physical Comfort, Relationship of Climatic Elements with Thermal Comfort, Thermal Stress Index, Bio-climatic Chart, Effective Temperature and Corrected Effective Temperature, Histogram with their uses, Wind Movement and Natural Ventilation.

UNIT-III: Sun Path and Building orientation

Movement of Sun, Understanding the movement of Sun, Solar Chart and its importance.
Importance of understanding the optimum orientation of buildings and their forms in relation to Sun, Concept and Design of Shading Devices.

UNIT-IV: Climatic Zones

Climatic Zones, Tropics and its Climatic zones, Macro and Micro Climate (site climate).
Role of Climate with respect to Shelter, Principles of Architectural Design and Study of various Indigenous Shelters in response to various design solutions of Climate Zones in the Tropical belt of India.

Course Outcomes:

At the end of the course, the students will able to understand climatology in Architecture as an important consideration.

Teaching Methodology

Emphasis should be given to understand the climate is affecting the various shelters and form.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Koenigsberger, O.H., "Manual of Tropical Housing & Building", University press, 1975.

- Kukreja, C.P., “Tropical Architecture”, McGraw-Hill, 1978.
- Evans, Martin., “Housing, Climate & Comfort”, Architectural Press, 1980.
- Lippsmeier, Georg., “Building in the Tropics, Callwey, 1980
- Govini, Baruch., “Man climate and architect”, Spon press,1990.
- Dahl, Torben., “Climate and architecture”, Routledge, 2009.
- Olgyay, Victor., “Design with climate" , Princeton University press, 2015.
- Krishan, Arvind., “Climate Responsive Architecture”, McGraw hill education, 2017

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Practical	int	ext		
BARCH309-21	**Computer Application-II**	1	2	60	40	3	No exam. Internal Viva Voce.

Course Objective: The objective of the subject is to enabled students to understand and apply Basic CAD skills to create simple and complex three dimensional objects and skill to render and animate the building models.

UNIT-I: Creating Three Dimensional objects

Introduction to computer aided 3d drafting. Understating tool, command and basic set up for 3D. introduction to 3d modelling techniques and construction planes, drawing objects, 3D surfaces, setting up elevation thickness and use of dynamic projections. Application of various tool bars for three dimensional modelling. Creating and editing simple and complex geometric meshes, surfaces and solids with there combination etc.

UNIT-II: 3D model of Buildings

Understanding and converting plan elevation and section of drawing to three dimensional building model using 3 dimensional tools. Creating building models using building software's by orthographic projections.

UNIT-III: Photorealistic rendering

Making Models photorealistic using materials, lighting, textures, background, etc. creating new materials and environments attributes.

UNIT-IV: Walk through of Interior / Exteriors

Create Interiors walk through for small spaces such as bed room, office, etc. by adding scenes, furniture, textures, finishes, with lighting effects and camera angles.
Create building exteriors walk through by adding scenes, trees, human figures, cars, sun light effects, and camera angles**.**

Course Outcomes:

At the end of the courses students should have capability to visualise the building Visualise the building and transform sketches from 2 dimensional CAD drawing to 3 dimensional building model and walk through.

Teaching Methodology

Making three dimensional photorealistic rendered architectural model for any one of the architectural design assignment completed in previous semester and to create walk through the same.

Guidelines for Paper Setter

No Exam

Evaluation Methodology

Internal Viva voce is conduction on the portfolio submission at the end of semester with the internal faculty and Head of Department/Principal

Software for References:

- Auto CAD Student Versions
- AutoDesk Revit
- Sketch up
- 3D Max
- Archi Cad
- Maya
- Photoshop

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH310-21	**Summer Training-**	-	-	50	0	s/ns no credit	No Exam

Course Objective: The training is compulsory and is for the orientation of the students of the B. Architecture so that they are aware of/can identify the industrial, departmental, environmental, societal and other issues that are a challenge in the society and develop the ability to find solutions.

UNIT-I: Building Terminology

Assignment on Building Terminology, to be covered as an assignment and submit the report.

UNIT-II: Study of Single Dwelling House

Making Building Layout Plans with measurements of any (Own) Existing House and making Layout of Ground Floor Plan, Layout of First Floor Plan, Kitchen Detail, Toilet Detail. Student can use auto cad or draw manually. Submit the drawing at the end of training.

UNIT-III: Market Survey of Material

Student shall do Market Survey for availability and rates of Construction materials available in the market along with samples. Submit the report at the end of training.

UNIT-IV: Visit to BrickKiln.

Visit to Construction Site, Study and Visit to Brick Kiln and submit the report.

Course Outcomes:

Teaching Methodology

Four (04) weeks Institutional Summer Vacation Training after 2nd semester is a compulsory. The students are required to maintain a daily dairy and submit it along with the "Problem formulation report". Student falling short of 75% attendance criterion is required to repeat the training with next batch. Continuous evaluation to be done and proper record to be maintained.

Guidelines for Paper Setter

Evaluation Methodology

The students need to submit a summary report along with sheets of the institutional training of Module I-II.A detailed report/ scrapbook of inventory and market survey done in Module III. The viva exam for the subject will be conducted along with the practical exams of the End-Semester Examination of Third Semester

References:

IKG PUNJAB TECHNICAL UNIVERSITY

BACHELOR OF ARCHITECTURE – 2021 SCHEME

4th Semester Study Scheme

TOTAL CREDIT – 24
TOTAL CONTACT HOURS- 26

Course Code	Course Name	Contact Hours				Total Marks		Credits	Univ. Exam (Hours)
		L	S	T	P	internal	external		
BARCH401-21	**Architectural Design- IV**	1	5	0	0	60	40	6	06 +Ext Viva Voce
BARCH402-21	**Building Construction -IV**	1	3	0	0	60	40	4	04
BARCH403-21	**History of Architecture-III**	2	0	1	0	40	60	3	03
BARCH404-21	**Structure System-II**	2	0	0	0	100	-	2	No Exam
BARCH405-21	**Structure Design-II**	2	0	1	0	40	60	3	03
BARCH406-21	**Building Services-I**	2	0	0	0	40	60	2	03
BARCH407-21	**Climate and Architecture-II**	2	0	0	0	40	60	2	03
BARCH408-21	**Building Materials-I**	2	0	0	0	40	60	2	03
BARCH409-21	**Mentoring and professional Development- II**	0	0	0	2	50	0	S/NS	Non Credit
TOTAL		**14**	**8**	**2**	**2**			24	

24th Dec 2022

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH401-21	**Architectural Design - IV**	1	5	60	40	6	06 Hours + Ext viva-voce

Course Objective: To make students appreciate the elements of vernacular/rural Architecture of a particular region of the state of Punjab and understand the role of vernacular/traditional in relative thermal comfort.

UNIT-I: Rural Architecture of Local Area

Study of Rural, Vernacular, Historical Settlements/buildings of distinct Architectural characteristics including detailing with physical planning, measured drawings and other related systems.

UNIT-II: Multiple user/Multiple Functions

Community Buildings Panchayat Ghar, Rural Dispensary or hostel Farmer's House, Village Dairy Farmhouses, Rural School, etc.

Course Outcomes:

At the end of the course, the students will able to Study Social and Physical environment and methods of construction in Vernacular/Rural Architecture, emerging out of the traditional way of life of the people in a given place with special reference to Punjab and understand the principles of design in vernacular/ traditional architecture w.r.t to thermal comfort, climate, and topography.

Teaching Methodology

Minimum two projects/ assignments to be handled by the students individually. Library and prototype studies should be carried out for other projects in groups. Model and perspective should be made integral part of project presentation. Stress should be laid on the understanding the basics of process of design.

Documentation of the project of village study or Vernacular budling to be present at the end of the semester.

Guidelines for Paper Setter

- One compulsory question is to be set from the entire syllabus, specially from vernacular/rural background.

Evaluation Methodology

- Evaluation is to be done through viva voce by external jury appointed by the college.
- Answer sheets should be retained at college level for the viva voce examination.
- The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.

References:

- Ching, Frank D.K., "Architecture: Form, Space & Order", John Wiley, Hoboken,2007.
- Parmar, V.S., "Design Fundamentals in architecture", Somaiya Pvt. Ltd, Mumbai,1997.
- Vandyke, Scott., "From Line to Design", Van Nostrand Reinhold,1990.
- Scott, Robert Gillam., "Design Fundamentals", Robart E. Krieger, 1980.
- E&OE., "Architects Hand Book and Planning", llife& Sons Ltd, 1963.
- Watson, Donald, Crosbie, Michael J., "Time-Saver Standards for architectural design", McGraw- hill education, 2001.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH402-21	**Building Construction- IV**	1	3	60	40	4	04 Hours

Course Objective: To make students understand and appreciate, various methods of building construction in coordination with the building materials and science related to Timber construction. Students will gain knowledge on the various applications of the timber roof construction system and other timber construction.

UNIT-I: Types of Roofs, Single and Double roofs

Introduction to different types of Roofs: Principles and Construction of Single Roofs: Flat Roof, Single Lean-to roof, Double lean-to roof, Collar roof, Couple roofs. Detail of Gutters, Eaves, and Ridge Details with/without Soffit and Roof Covering. Principle and construction of Double Roofs in timber.

UNIT-II: Triple Roofs

Principles of Construction and Details of King Post and Queen Post roof Trusses with Gutters, Eaves, and Ridge Details with/without Soffit and Roof Covering

UNIT-III: Built Up trusses

Timber Built-up Trusses of various Spans of 6M, 7M, 9M, 10M and 12M.

UNIT-IV: Special Purpose timber products

Design and Details of special-purpose door – Sliding door, Sliding and folding door, Timber partition, glass block partition, timber panelling Timber Staircase-Design and Details, Dhajji Wall Construction

Course Outcomes:

At the end of the course student will be able to become aware of the timber roof covering and other timber product construction system. Understand details for trusses, staircases, sliding doors, sliding folding doors, partitions, panelling, work out and apply appropriate details for building construction of the same.

Teaching Methodology

Teaching in the subject shall be made combination of: Field/ Project visits-to study the uses of various materials in construction industry and process of lying. Roof Coverings, Staircases and Doors and Windows of timber. Preparing Construction plates. Visit to Forest Research Institute, Dehradun or similar placed institutions. Models of Trusses with roof coverings.

Guidelines for Paper Setter

- Two questions are to be set from each part and students would be required to attempt minimum one question from each part.
- Students would be required to attempt four question in total.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

NA

References:

- Mitchel,G.A., "Elementary Building Construction", B T Batsford Ltd, London , 1961.
- Punmia B.C., "Building Construction", Laxmi, 2016.

- .Mckay, W.B., “Building Construction (Vol 1-4)”, Longmans, U.K 1981.
- Barry, R., “Construction Of Buildings (Vol. 1-4)”, Oxford: Blackwell Scientific, 1999.
- Chudley, R., “Construction Technology (Vol. 1-4) Longmans”, Uk 1981.
- Ching, Frank D.K., “Building Construction Illustrated”, John Wiley, New York 2003

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial/ Studio	int	ext		
BARCH403-21	**History of Architecture-III**	2	1	40	60	3	03 Hours

Course Objective: To appreciate the constraints in the Architectural design of an ancient building with reference to its function, form and structures. To make students understand how different Architectural solutions were evolved (in successive historical period) within the limitations imposed by prevalent social and religious customs, available building materials, climate of region/topography, complex structural problems and the limited technology available at that time period.

UNIT-I: Hindu Architecture

Northern or Indo-Aryan Style: Orissa A.D. 800-1250

Orissian style temple, its parts, basic elements and development of temple, sun temple at Konark, Linga raja Temple, Muktsewar temple, Raja Rani temple of Orissa.

Indo Aryan Gujarat 940-1300

Gujarat style temple, its parts basic elements and development of temple, Sun temple at Modhera, Gujarat

UNIT-II: Hindu and Jain Architecture

Northern Indo Aryan : Khajuraho A.D.950-1050

Khajuraho style temple its parts and development of temple, development of shikara, Khandariya Mahadev temple, Laxman temple and Khajuraho group of temple.

Jain Architecture: introduction to Chaumukh temple, Chaumukh temple of Adinatha at Ranpur, Jodhpur, Jian temple at Mount. Abu.

UNIT-III: Islamic Architecture

Architecture of Mughal Period 1526 AD to 1707 AD:

Architecture of Mughal period, Elements of Mosques, Mughal Architecture of Delhi, Agra and Fatehpur Sikri. Red fort Delhi, Jami masjid at Delhi, Humayun Tomb at Delhi, Fatehpur Sikri Palace, Jami Masjid at Fatehpur Sikri, Bulunad Darwaja at Fatehpur Sikri, Taj Mahal at Agra,

UNIT-IV: World Architecture

Gothic Architecture: Study of Architecture Characteristics and evolution of church form, building typology and building elements. Gothic in France,- Notre Dame church, Reims Cathedral, Gothic In central Europe and other area- Westminster Abbey. Gothic In Italy- Milan Cathedral, S. Marai Del Flore, Florence,

Renaissance Architecture: Study of Architecture Characteristics and evolution of church form, building typology and building elements. Early Renaissance in Italy: Pazzi Chapel: Florence, S. Lorenzo, Florence, S. Andrea, Mantua, Palazzo Pitti, Florence, Palazzo Riccardi, Florence, Palazzo Strozzi, Florence, France, High renaissance and Mannerism:- S.Pietro in Montorio, Rome, St. Peter Rome, Villa Capra, The Capitol at Rome. Baroque and Rocco period- St. Peter Rome.

Course Outcomes:

At the end of the course, the students will be able to developing a holistic approach to architecture as an integral component of the built environment. Develop an understanding of architecture as an outcome of various social, political and economic influences and as a response to the cultural and climate conditions. Understand the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture

Teaching Methodology

For each period, stress is to be laid on the Architectural character and elements of Architecture with only one or two representative examples to highlight these features. Emphasis should be laid on understating of evolution of buildings and form. Continuous evaluation shall be made from students work based on various models, assignments and sketching

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and students would be required to attempt minimum one question from each part
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Fletcher, Banister., "A History of Architecture", University of London, The Antholone Press, 1986.
- Fergusson, James., Willey, John, "A History of Architecture", Low Price Publication, 2012.
- Fergusson, James., Willey, John, "History of Indian & Eastern Architecture", Saraswati press, 2012.
- Tadgell, Christophe., "The History of Architecture in India", Phaidon Press,1994
- Percy Brown., "Hindu and Buddhist Period"
- Percy Brown., "Islamic period"

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH404-21	**Structure System-II**	2	0	100	-	2	No Exam. Internal Viva Voce

Course Objective: To make students learn basics principles of structure systems with emphasis on learning by doing and making 3-D models to provide the student with different spatial experience.

UNIT-I: : Form Active Structure System

Form Active Structural System: Definition and Spans, Structural System in Simple Stress Conditions: Cable Structures, Tents Structures, Pneumatics Structures, Arch Structures: Funicular Arch, Thrust Lattice.

UNIT-II Surface Active Structure System

Surface active Structure System: Definition and Spans, Plate Structures, Folded Plate Structures, Shells Structure: Cylindrical Shells, Dome Shells, Saddle Shells.

UNIT-III: Vertical Active Structure System and Geometry Structure Form

Vertical/Height Active Structure System: Definition, deformation and stabilizations, System of vertical load transfer, Typical Structural Forms, Elevation Geometries.
Geometry Structure Forms: Folding and Flat Surfaces, Singly Curved Surfaces, Dome Surfaces, Saddle Surfaces.

UNIT-IV: Application of Structure System in Architecture

Application of Form Active, Surface Active, vertical active structure system and Geometrical Structure Form in the building by making different models.

Course Outcomes:

At the end of the course, the students will be able to gain ability to comprehend the Design erection process and application of large span structures. To understand the need and importance of prefabricated components and structures as an alternative to cast in situ construction process. To understand the needs, requirements, and selection for various types of structures systems.

Teaching Methodology

Emphasis shall be on making students understand the principles and systems involved in various topics. The students should be made to Coordinate the fabrication of at least four models to demonstrate the various structural system. Students be taken to Pragati Maidan & other Building centres in New Delhi for better exposure. Students be encourage to present a PPT on the topics assigned and submit its report for internal evaluation.

Guidelines for Paper Setter

No Exam

Evaluation Methodology

- Portfolio Submission at the end of semester with models and internal jury

References:

1. Engel,H, Structure System, 1997

2. R. K. Bansal, “Engineering Mechanics & Strength of Materials Publisher, Laxmi Publications Pvt Limited, 1998.
3. Khurmi-Structure Mechanics
4. Prof.Harbhajan Singh-Theory of Structure

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH405-21	**Structure Design - II**	2	1	40	60	3	03 Hours

Course Objective: The aim and objective of the course on structure design-II are to get introduced to the design of reinforced concrete structures and to make the building structurally safe.

UNIT-I: Beams

Design of Single Reinforced Beams, Doubly Reinforced Beams, Depth/ Thickness of Section Area of reinforcement, Shear Check, Shear Reinforcement, Introduction to Cantilever beam, T-Beams and L- Beams

UNIT-II: Slabs

Design of One-Way Slab, Depth/Thickness of Section Area of Reinforcement, Shear Check, I S 456 Code- provisions, Introduction to Two Way Slab, *ly /lx* ratio.

UNIT-III: Column

Design of Columns, Long /Short Columns, Basic Equation of Design, IS 456 Code Provisions, Section of Column, Longitudinal and Lateral Reinforcement.

UNIT-IV: Footing

Design of Isolated Square Footings, Consideration of Bending Moment, One Way Shear, and Two-Way Shear, Area of reinforcement

Course Outcomes:

At the end of the course, the students will able to – design RCC Beams, Slabs, Columns, and footings with different loads for one-story simple buildings.

Teaching Methodology

Structural design shall be supplemented by structural drawings.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Bansal, R. K., "Engineering Mechanics & Strength of Materials Publisher", Laxmi Pvt Limited, 1998.
- Rao, K.L., "Applied Mechanics", McGraw hill education.
- Mehta, J. C., "Applied Mechanics", New Asian, 1963.
- Timoshenko, Stephen., "Strenth of Materials", Krieger, 1976

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH406-21	**Building Services-I**	2	0	40	60	2	03

Course Objective: To make students learn and understand the requirements of Building Services and their application to buildings with a focus on Water Supply, Drainage, and Sanitation.

UNIT-I: Water Supply,

Water- Role & Importance, Sources, Quality, Impurities, Water Supply- Introduction, Basic Principles, Systems of Water Supply, Water Storage – Systems, Capacity and Location, Calculation of Water consumption, Domestic, hot and cold water supply systems, Pipes materials- Size and their jointing details, Fittings- sanitary fittings like Ferrule, Stopcock, Bibcock, etc, Metering- Various kinds of Water Meters and connections.

UNIT-II: Sanitation

Sanitation- Role, Importance, Basic principles of disposal of waste from buildings, Dry and Wet Carriage Systems, Sanitary Fittings-- Washbasins, WC's, Bath Tubs, Sink, Urinals, Bidets, Flushing Cistern, Traps, etc.

Various types of joints, Pipe materials- Size and their jointing details, Septic Tanks, Treatment Plants, Manholes, Chambers- Purpose, Location, Structure and Ventilation, Drainage Systems- Types, Advantages/Disadvantages -- separate, combined and partially combined systems, Stack system--One pipe and two pipe systems, Testing of Drains, Gradients-- Purpose and Principle for laying Drains and Sewers. Self -cleansing and non-scouring velocities, Size of Drain Pipes, and Materials used.

UNIT-III: Stormwater Disposal

Types of Roads-WBM (water-bound macadam) Road-Tar, Bitumen, Asphalt and RCC roads, Description and Suitability of Roads for Storm Water Drainage with Comparative Cost Analysis, Pavements- Types (Soil stabilized, Brick and Stone paving, interlock tiles), Use, Advantages/Disadvantages, Drainage- Sub- drains, Culverts, Ditches, Gutters, Drop inlets and Catch Basins, Rain Water Disposal for individual buildings. Rain Water Harvesting

UNIT-IV: Services Drawing

Preparation of the drawings/ layouts of the building services in the design project of 3 and 4 semesters by the student. Kitchen and bathroom layout must be highlighted.

Course Outcomes:

At the end of the course, the students will able to: Understand the terminology and basic principles of water supply, stormwater drainage, and sanitation. Understand water requirements in various types of buildings, types of water storage and distribution systems, sanitary & drainage system requirements, and their integration in architectural design. Understand the functions of various sanitary fittings and fixtures and be aware of the different types of materials and specifications of the same. Develop design skills for water supply and drainage systems in buildings and prepare architectural drainage layouts.

Teaching Methodology

Subject shall be taught through the combination of Guest Lectures, Field visits, Visits to the Project Sites, actual display of Fittings, Pipes, Joints used and by carrying out exercises in layout of simple drainage, systems for small buildings, Planning of Bathrooms and Lavatory Blocks in Domestic and Multi-storied buildings.

• Provision of Water Supply, Sewerage and Storm Water Disposal services shall be made integral part of the Design Studio Project.

• Site visit for STP.

Guidelines for Paper Setter

One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.

• Two questions are to be set from each part and student would be required to attempt minimum one question from each part.

• Student would be required to attempt five questions in all including compulsory question.

• Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

Market survey to be done for the materials available. The subject shall be taught through the combination of Guest Lectures, Field visits, Visits to the Project Sites, the actual display of Fittings, Pipes, Joints used, and by carrying out exercises in the layout of simple drainage systems for Small buildings, Planning of Bathrooms and Lavatory Blocks in Domestic and Multi-storied buildings Exercises shall be clubbed with Design Studio Project.

References:

1. Duggal, K.N., “Public Health Service”, Chand, 1967.
2. Birdi, G.S.,“Water Supply And Sanitation”, Dhanpat Rai, 2010.
3. Barry, R., “Building Servicies, John Wiley and Sons Ltd 1998
4. Garg, S. K., “Water Supply Engineering”, Khanna, 2010.
5. Golany, Gideon S., “Design for Arid Regions”,Van Nostrand Reinhold, 1983.
6. Givoni, B., “Man, Climate & Architecture”, Von Nostrand Reinhold Company, 1981.
7. Krishan, Arvind., “Climate Responsive Architecture”, McGraw hill education, 2017.
8. C.B.R.I, Roorkee, Reserch notes on climate.
9. TERI, Energy Efficient Buildings in India

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH407-21	**Climate and Architecture -II**	2	0	40	60	2	03 Hours

Course Objective: : To acquaint the students and make them aware of the concept of climate as a significant determinant of built forms and to familiarize them with various climate control devices

UNIT-I: Ventilation in Buildings

Ventilation - Introduction and its mechanism, Wind Movement, Air movement within and around buildings, effect of surrounding elements and pattern of wind flow, Guidelines for designing well ventilated buildings, Optimum Orientation of Building—Importance, Form and Placement of Building.

UNIT-II: Solar Radiation

Introduction to basic Thermal Units, Theory of Heat Flow, Heat Transmission etc. Thermal Properties of various Building Materials, Solar Radiations- Movement of Sun, Method of Recording, Radiation Gains by various Materials, Study of various Landscape Elements and Solar Passive Devices for Climatic Control within Buildings.

UNIT-III: Sustainability and Energy conservation

Sustainability - Concept, Definition, Importance and Scope , Sustainable Buildings- Concept, Importance, Approach ,Design Principles and Advantages, Introduction to ECBC Codes, Introduction to GRIHA. Introduction to Energy Demand and Consumptions. Energy Saving Technique in Buildings. Alternate Energy Sources in India. Introduction of energy software's.

UNIT-IV: Sustainable development and Software's for energy conservation and sustainable development.

Introduction to Ecotec and Design Builder Software, **Sustainable Development-** Introduction, definitions, objectives and scope, **Man and Environment**- Introduction, issues and options, **Human Settlements**- Planning, Growth, Development, Problems, **Global warming –** Introduction, Causes, Effects and Remedies, Carbon Credits**.**, Architect**-Role in Sustainable Development.**

Course Outcomes:

At the end of the course, the students will able to understand climatology in Architecture as an important consideration.

Teaching Methodology

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics specially form Unit -III and Unit -IV.

Evaluation Methodology

References:

Koenigsberger, O.H., “Manual of Tropical Housing & Building”, University press, 1975.

- Kukreja, C.P., “Tropical Architecture”, McGraw-Hill, 1978.
- Evans, Martin., “Housing, Climate & Comfort”, Architectural Press, 1980.
- Lippsmeier, Georg., “Building in the Tropics, Callwey, 1980
- Govini, Baruch., “Man climate and architect”, Spon press,1990.
- Dahl, Torben., “Climate and architecture”, Routledge, 2009.
- Olgyay, Victor., “Design with climate" , Princeton University press, 2015.
- Krishan, Arvind., “Climate Responsive Architecture”, McGraw hill education, 2017

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Practical	int	ext		
BARCH408-21	**Building Materials-I**	2	0	40	60	2	3 Hours

Course Objective: To make students understand and appreciate the building materials and science related to them. Students will gain knowledge on the various applications of the roof covering materails, timber, Natural and commercial, floor coverings, Glass and PVC in building construction.

UNIT-I Glass, PVC & UPVC, Steel and Aluminium

Glass

Glass as a building material, Classification, Composition and Properties of Glass. Characteristic and uses of various types of Glass and their application in buildings.

PVC and UPVC

PVC and UPVC as a building material, Classification, Composition, and Properties. Characteristics and uses of various types of PVC and UPVCs and their application in buildings

Aluminium

Aluminium as a building material, Classification, Composition, and Properties. Characteristics and uses of various types of Aluminium and their application in buildings

Steel

Steel as a building material, Classification, Composition, and Properties. Characteristics and uses of various types of steel and their application in buildings The study of manufacturing process, casting, characteristics, form and uses of Cast Iron, Wrought Iron, Steel, Stainless Steel, Aluminium, copper as building materials

UNIT-II: Timber, Cements and Aggregates.

Timber

Natural timber its types and properties, Seasoning of timber, Manufacturing process and qualities of Decorative and Commercial timber product used in buildings.

Cement and Aggregates

Cement types and Grades, uses and properties. Aggregates and sand its uses, types and classification. Water Cement ratio.

UNIT-III: Roof Covering and Laying

Constituents, Properties, Uses, Process of Laying of Roof Covering Materials e.g. G.I. Sheets, Asbestos Cement Sheets (Plain & Corrugated) with accessories, Clay Tiles - Country, Allahabad & Mangalore Tiles, etc. and PVC covering

Properties and applications of copper, titanium and carbon fibre in buildings.

Various structural members, Sections and Joinery in Steel, Aluminium and PVC.

UNIT-IV: Floor Covering and laying

Constituents, Properties, Uses and Process of Laying of Floor Covering Materials e.g.Brick flooring, PCC Flooring, Terrazo Flooring, Marble flooring, Tile Flooring, Granite Flooring, Paver Block flooring Linoleum, Cork Sheet, Parquets, Rubber (Tiles and Sheets) and introduction to industrial flooring.

Course Outcomes:

At the end of the course student will be able to become aware of the roof and floor coverings, glass, steel and timber as building material. Understand details of various material and construction details work out and apply appropriate details for building construction of the same.

Teaching Methodology s

Teaching in the subject shall be made combination of: Field/ Project visits-to study the uses of various materials in construction industry and process of lying. Floor/Roof Coverings.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

NA

Software for References:

- Punmia B.C., "Building Construction", Laxmi, 2016.
- Rangwala S.C., Rangwala K.S., "Engineering Materials", 2009
- Duggal S. K., "Building Materials", New Age International, 2012
- Gambhir M. L., Jambal. N, " Building Materials", 2017

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Practical	int	ext		
BARCH409-21	**Mentoring and Professional Development-II**	-	2	50	0	s/ns no credit	No Exam

Course Objective: Guidelines regarding Mentoring and Professional Development The objective of mentoring will be development of:

- Overall Personality
- Aptitude (Technical and General)
- General Awareness (Current Affairs and GK)
- Communication Skills
- Presentation Skills

The course shall be split in two sections i.e. outdoor activities and class activities.

UNIT-I: Class Activities

Part – A (Class Activities)

1. Expert and video lectures
2. Aptitude Test
3. Group Discussion
4. Quiz (General/Technical)
5. Presentations by the students
6. Team building Exercises

UNIT-II: Outdoor Activities

B (Outdoor Activities)

1. Sports/NSS/NCC
2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.

Evaluation shall be based on rubrics for Part – A & B.

Mentors/Faculty in charges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

Course Outcomes:

Teaching Methodology

The course shall be split into two sections i.e. outdoor activities and class activities.

Guidelines for Paper Setter

NO Exam

Evaluation Methodology

The evaluation shall be based on rubrics for Unit – I & II. Mentors/Faculty in charges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

References:

IKG PUNJAB TECHNICAL UNIVERSITY

BACHELOR OF ARCHITECTURE – 2021 SCHEME

5th Semester Study Scheme

TOTAL CREDIT – 26
TOTAL CONTACT HOURS- 27

Course Code	Course Name	Contact Hours				Total Marks		Credits	Univ. Exam (Hours)
		L	S	T	P	internal	external		
BARCH501-21	**Architectural Design- V**	1	5	0	0	60	40	6	12 +Ext Viva Voce
BARCH502-21	**Building Construction -V**	1	3	0	0	60	40	4	04
BARCH503-21	**Theory of Design-III**	2	0	0	0	40	60	2	03
BARCH504-21	**Landscape Architecture-I**	2	0	1	0	40	60	3	03
BARCH505-21	**Structure Design-III**	2	0	1	0	40	60	3	03
BARCH506-21	**Building Services-II**	2	0	0	0	40	60	2	03
BARCH507-21	**Surveying and levelling**	2	0	1	0	40	60	3	03
BARCH508-21 BARCH509-21 BARCH510-21	**Elective -I (Interior/Product/Fur Dsn)**	2	0	0	0	40	60	2	03
BARCH511-21	**Mentoring and Professional Development-III**	2	0	0	0	50	Satisfactory / Non-Satisfactory		No Exam
BARCH512-21	**Industrial Training**	0	0	0	0	50	0	1	No Exam
TOTAL		**16**	**8**	**3**	**0**			26	

27 July 2023

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH 501-21	**Architectural Design - V**	1	5	60	40	6	12 Hours + Ext viva-voce

Course Objective: The objective of the subject is to enable students to understand: How to design in developing urban areas and Characteristics of a public building. To make students understand and appreciate the constraints in the designing of a buildings with reference to function, form and structure. To create awareness about the role and Importance of physical factors in Architectural Design on flat or contour site.

UNIT-I: Multi User Building, Urban Setting (Residential and Recreational Building)

Understanding dynamics of public buildings; activities of visitors and regular users. Providing for daily/regular, monthly, annual events and activities. Relating space and individual; human scale and urban scale. Societal aspirations for aesthetics and form. Role of climate, building services, construction methods, bye-laws, codes (NBC etc.) on building and site design

Exercises on studies for grouping of activities in a public building. Design (form and space) for multi activity public facility like shopping complex, Dharamshala, inns, motels, budget hotels, etc. in small and medium towns.

UNIT-II: Multi User Buildings - Public building (Institutional Nature)

Understanding dynamics of public buildings; activities of visitors and regular users. Providing for daily/regular, monthly, annual events and activities. Relating space and individual; human scale and urban scale. Societal aspirations for aesthetics and form. Role of climate, building services, construction methods, bye-laws, codes (NBC etc.) on building and site design

Exercises on studies for grouping of activities in a public building. Design (form and space) for multi activity public facility like District Collectorate office, Degree College, Residential School, corporation office, Museum, Libraries etc. in small and medium towns.

Course Outcomes:

With the successful completion of the course student should have capability to:
Design for multiple groups of users with due consideration to site, climate, services, bye-laws.
Understand the relationship between design and urban setting and derive a design process and design solution for a public building

Teaching Methodology

Minimum two projects/ assignments to be handled by the students individually. Library and prototype studies should be carried out for other projects in groups. Model and perspective should be made integral part of project presentation. Stress should be laid on the understanding the basics of process of design.

Guidelines for Paper Setter

- One compulsory question is to be set from the entire syllabus.

Evaluation Methodology

- Evaluation is to be done through viva voce by external jury appointed by the college.

- Answer sheets should be retained at college level for the viva voce examination.
- The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.

References:

- Ching, Frank D.K., "Architecture: Form, Space & Order", John Wiley, Hoboken,2007.
- Scott, Robert Gillam., "Design Fundamentals", Robart E. Krieger, 1980.
- E&OE., "Architects Hand Book and Planning", llife& Sons Ltd, 1963.
- Baiche, B. and Walliman, N. (2012). Neufert Architects Data, 4th Ed. Oxford : Wiley-Blackwell.
- Chiara, J. D. and Michael, J. C. 2001. Time Savers Standards for Building Types. Singapore : McGraw Hill Professional.
- Gauzin-Muller, D. (2002). Sustainable Architecture and Urbanism: Concepts, Technologies, Examples. 1 st Ed. Basel : BirkhauserVerlag AG.
- Huxtable, A-L. (1984). Tall Buildings Artistically Reconsidered.
- Kloft, E. and Johann, E. (2003). High-rise Manual: Typology and Design, Construction and Technology, 1st Ed. Basel : Birkhauser Verlag AG.
- Parker, D. And Wood, A. (2013). The Tall Buildings Reference Book. New York : Routledge. 8. Wood, A. and Ruba, S. (2012). Guide to Natural Ventilation in High Rise Office Buildings. New

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH502-21	**Building Construction- V**	1	3	60	40	4	04 Hours

Course Objective: The objective of the subject is to enable students to understand: • Large span truss components and construction details. • Use of materials like steel, aluminum, glass, gypsum in interiors and exteriors; their construction and to enable them to represent same through technical drawings.

UNIT-I: Steel trusses and Roofing

Types and fixing details of steel trusses – saw tooth, roof truss with north light glazing, simple trusses in steel, and ways of fixing and connections (to foundations, steel stanchions, and beams etc.). Space frames (single, double & triple layered tubular space frames with globe connections). Types of materials and details of industrial buildings, warehouse and other building typologies.

UNIT-II: Steel, Aluminium, and PVC -Door and Windows

Study of Various types of Doors, windows and frames of Aluminium, Steel and PVC. Study of Sliding door in Aluminium, Steel and PVC.

UNIT-III: Partitions, Grills and Panels

Study of various types of aluminium and PVC partitions, its extrusions and fixing details. Different types of PVC, aluminium panels, cladding components for various types' buildings and structures. Aluminium, glass and steel grill modules.

UNIT-IV: -Glass and Gypsum

Various techniques to use glass and glass blocks with fixing details (structures like pavilions, greenhouses, staircases, multi storied buildings –curtain walls, roofing, panels). Curtain Wall and Structure Glazing details. Gypsum wall and its construction detail for interiors.

Course Outcomes:

With the successful completion of the course student should have capability to:
1. Make a decision which type of construction detailing will be required for a given type of roofing depending on interior and exterior situation and make drawings for the same.
2. Understand design and execute wall partitions with different materials.
3. Understand and execute glass as material.
4. Understanding different type of door and windows and prepare detail drawings.

Teaching Methodology

- Field visits to study the uses of metals in construction industry and process of lying of Steel Trusses, Aluminium.
- Study of Joinery of metals in workshop.
- Preparing Construction plates on above topics.
- Market study of the products available under different trade names with details of their manufacture, specification and performance.

Guidelines for Paper Setter

- Two questions are to be set from each part and students would be required to attempt minimum one question from each part.

- Students would be required to attempt four questions in all.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Mitchel,G.A., “Elementary Building Construction”, B T Batsford Ltd, London , 1961.
- Punmia B.C., “Building Construction”, Laxmi, 2016.
- .Mckay, W.B., “Building Construction (Vol 1-4)”, Longmans, U.K 1981.
- Barry, R., “Construction Of Buildings (Vol. 1-4)”, Oxford: Blackwell Scientific, 1999.
- Chudley, R., “Construction Technology (Vol. 1-4) Longmans”, Uk 1981.
- Ching, Frank D.K., “Building Construction Illustrated”, John Wiley, New York 2003

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH503-21	**Theory of Design-III**	2	0	40	60	2	03 Hours

Course Objective: To make students drive deeper into the Architecture problems and look for directive principles guiding the philosophy of design used by masters of modern/Post modern Architecture and to assess their contribution by their own criteria. Disseminating a broad overview of Art and Design and enabling students to understand visual awareness, creativity and cultural understanding of Design as a Multidimensional creative Art by master Architect's.

UNIT-I: ***Foreign Architects – Modern/Post modern Era***

The principles and philosophy of modern/postmodern - in art, design and architecture, worldview and mode of reasoning. Discussions/Presentations on Works/Philosophies of International Architects of Modern/Post Modern Era of Ar. Loius.I Kahn, Ar. Eero Sarinen, Ar. Philips Johnson, and Ar. Paul Rudolph. There Philosophy, works and his influence on architecture in India.

UNIT-II: ***Foreign Architects-Post Modernistic /Deconstruction***

Discussions/Presentations on Works/Philosophies of International Architects of Modern/Post Modern Era of Norman Foster, Tadao Ando, Frank Gehry, James Sterling, Richard Meier

UNIT-III: Indian Architects- ***Post Modernistic /Contemporary***

Discussions/Presentations on Works/Philosophies of Indian Architects of Post Modern Era of Ar. B.V. Doshi, Ar. Joseph Alien Stein, Ar. A.P. Kanvinde, and Ar. U.C. Jain and their contribution on Indian Soil. Focus should be how these architects achieved the Sustainability in their design.

UNIT-IV: Indian Architects- ***Post Modernistic /Contemporary***

Discussions/Presentations on Works/Philosophies of Indian Architects of Post Modern Era of Ar. Charles Correa, Ar. Raj Rewal, Ar. Laurie Baker and Ar. Nari Gandhi and their contribution to achieve the sustainable buildings.

Course Outcomes:

At the end of the course, the students will able to understand, appreciate and learn the design principles, philosophy of design used by masters of modern architects

Teaching Methodology

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.

Evaluation Methodology

References:

Jogelekar, M.U., Das, S.K., “Contemporary Indian Architecture Housing and urban development”, Galgotia, 1995.
2. Kanvinde, A.P., “Campus planning in India”.
3. Ching, Frank D.K., “Architecture: Form, Space & Order”, John Wiley, Hoboken, 2007.
4. Fletcher, Banister., “A History of Architecture”, University of London, TheAntholone Press, 1986.

7. Moderen Architecture since 1900. 8. Global Architecture (ADA Aditia Tokyo) Vol - 2, 3 & 4

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH504-21	**Landscape Architecture-I**	2	1	40	60	3	03 Hours

Course Objective: To make students understand the elements of Landscape Design and its application in Architectural Design solutions.

UNIT-I: Landscape - Introduction

Introduction to Landscape architecture- its meaning, need and scope, relationship of human and nature, its influence on physical and visual environment. Relationship of landscapes to land, nature, environment and place. Elements and principles of Landscape, form and spatial compositions and its relation to the built environment.

UNIT-II: Hardscape and Softscapes

Brief overview of the use of landforms, water, plants, built elements, application of materials, street furniture in a designed landscape.

Hardscape: Pavements, decks, walls, fences, steps, benches, railings and trellises Structure, Colour, Form, Foliage of various types of Trees, Shrubs, Cacti Bushes and Creepers etc.

Softscape: Plantation, turfing and water features. Basic knowledge of Trees, Shrubs, Cacti Bushes and Creepers etc. Identification and study of a few Indian plants and trees their characteristics, propagation, flowering sessions and uses.

UNIT-III: History of landscape

Indian Gardens: Study on comparative basis of development of landscape design through history: Indian Garden and Mogul Gardens.

Western Gardens: Study of development of landscape architecture through history in different parts of the world such as Italy, France, Japan, Persia, England. Study on comparative basis of development of landscape design through history: Italian Gardens, French Gardens, English Gardens Japanese Gardens and Persian Gardens

UNIT-IV: Site Planning

Site survey and appraisal, Site Inventory checklist – Topography, vegetation, soil, hydrology, climate etc. Principles of site planning, Design issues in site planning and siting of buildings. Integrating the built and open space

Course Outcomes:

At the end of the course, the students will able to understand and appreciate the elements, principle and need of design and apply the same in landscape design solutions.

Teaching Methodology

Teaching shall be imparted through a combination of lectures by subject experts, visits to the historical gardens developed over the period, landscape projects of repute, study of native and other trees etc. Continuous evaluation shall be made of students work based on assignments and sketching and scrap book of trees should be made.

Guidelines for Paper Setter

One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
• Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
• Student would be required to attempt five questions in all including compulsory question.
• Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

- Portfolio Submission at the end of semester and internal jury

References:

1.Reid, Grant., "Landscape Graphics", Watson-Guptill, 2002.
2. Littlewood, Michael., "Landscape Detailing", Architectural press, 1993.
3. Harris, W.; Dines, Nicolas T., "Time Saver Standard for Landscape Architecture", McGraw Hill, 2017.
4. Simonds, John O.," Landscape Architecture", McGraw Hill,1997.
5. Laurie, Michael., "Introduction to Landscape Architecture", Prentice hall, 1985.
6. Wattas, Rajnish., "Trees of Chandigarh", B.R. Corporation.
7. Krishen, Pradip., "Trees of Delhi", Penguin books Pvt. Ltd., 2006.
8. Bose, T.K., "Tropical garden plants in colours", South Asia book, 1992.
9. Randhawa, M.S., "Flowering Trees and Shrubs of India",1899

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH505-21	**Structure Design - III**	2	1	40	60	3	03 Hours

Course Objective: The aim and objective of the course on Structure Design- III is to make students aware about the design methodology adopted and principals involved in designing the structural elements used in the built environment with focus on steel.

UNIT-I: Compression Members

Design of Compression members subjected to axial loading involving: Effective length, Radius of gyration, Slenderness ratio, Permissible Stresses

UNIT-II: Steel beams

Design of Steel Beams and Sections on the basis of: Bending Stress, Shear Check

UNIT-III: Steel Truss

Design of Steel Truss Members for Given Loading, Compressive and Tensile Forces

UNIT-IV: Riveted/Welded Joints

Riveted Connections: Different types of Rivets, Type of Riveted Joints, Failure of Riveted Joints, Efficiency of Riveted Joint
Welded Connections: Different types of Welds, Advantages/Disadvantage of Welded/ Riveted connections

Course Outcomes:

At the end of the course, the students will able to –
Design Beams, Compression members, trusses for different conditions by applying code provisions along with the knowledge of Riveted and welded joints

Teaching Methodology

Structural design shall be supplemented by structural drawings. Focus on the live study and application of the subject into the architecture design.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Bansal, R. K., "Engineering Mechanics & Strength of Materials Publisher", Laxmi Pvt Limited, 1998.
- Rao, K.L., "Applied Mechanics", McGraw hill education.
- Mehta, J. C., "Applied Mechanics", New Asian, 1963.
- Timoshenko, Stephen., "Strenth of Materials", Krieger, 1976

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH506-21	**Building Services-II**	2	0	40	60	2	03 Hours

Course Objective: To make students learn and understand the requirements of Building Services and their application to buildings with focus on Electrical, lighting, fire and mechanical circulation.

UNIT-I: Electrical Services

Electricity- Ohm's , Kirchhoff's Laws and basic Principles. Electric Circuits-- Series and Parallel. Domestic installations- Water heater, Radiator etc. Wires- Specifications /Carrying capacity , Electrical loads. Types of Switches, Sockets and Fixtures. Distribution Boards, Circuit Breakers, Fuses, Electrical Meters and their layout. Design considerations for Electrical Installations from generation to distribution(Energy Flow Diagram). Protection against Overload, Short circuit, Earth fault, Lightening and other safety measures for buildings. Wiring systems- Materials, Types/Methods of wiring

UNIT-II: Illuminations

Light - Propagation, Reflection, Radiation, Transmission and Absorption. Illumination –Laws, Measurement, Luminous Intensity, Brightness, Luminance Flux, Glare and their effect. Etc. Illumination Schemes- Types and their design considerations. Light Flux method for calculation of number of lamps for illumination. Lamps-Incandescent, Sodium Vapour, Mercury Vapour, Fluorescent and Neon lamps etc. Types of Luminaries for interior and exterior lighting. Residential, commercial, industry, flood and street lighting. Testing before commissioning of electrical services.

UNIT-III: Fire Safety

Fire—Causes, Spread, Combustibility of Materials and Safety Norms. Fire Detection/Warning-Equipment including Smoke Detectors, Monitoring Devices, Alarm Systems. Etc. Fire Fighting—Planning, Designing, Installations, Equipment, Operation and Maintenance. Design Criteria for Fire Exit and Escapes in High Rise Buildings.

UNIT-IV: Mechanical Services

Air-conditioning: refrigeration cycle, systems of air conditioning: Unit, split, package, Directexpansion, Chilled water System, Ducting & air conditioning layout, fittings and fixtures.

Lifts-Types, Control and Operation, Carrying Capacity, Rated Load, Rated Speed, Lift - Sections, Machine Room, Components, Lift Well and Lift Pit. Design Standards - Lifts Lobby, Lift Cars etc Escalators and Conveyors- Installation and Planning Requirements.

Course Outcomes:

At the end of the course, the students will able to: Understand the terminology and basic principles MEP Services Develop design skills for MEP layouts in architecture design

Teaching Methodology

Teaching methodology will be a combination of guest lectures from subject experts, Lectures and Site Visits/ Visits to the project Sites and Studio Exercises. Teaching shall also be w.r.t. provisions of NBC

• Incorporating layouts of relevant services in a multipurpose hall showing Electrical Layout, Fire Safety Plan and Acoustical details.

Guidelines for Paper Setter

One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.

• Two questions are to be set from each part and student would be required to attempt minimum one question from each part.

• Student would be required to attempt five questions in all including compulsory question.

• Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

1. Barry, R., "Building Servicies", John Wiley and Sons Ltd, 1998.
2. B.I.S., "National Building Code",2016.
3. TERI., "Sustainable Building Design Manual",2009.
4. Jain, V.K., "Handbook of Designing and installation of Services in Buildings", Khanna publishers, 2000.
5. Basak, N.N., "Environmental Engineering", McGraw Hill Education, 2017
6. Stein, Benjamin., "Mechanical and Electrical Equipment for Buildings", Wiley, 2009.
7..Abnwos, F. and Others. Electrical Engineering Hand Book.
8. Bovay, H. E. (1981). Handbook of Mechanical & Electrical systems for Buildings. McGraw-Hill Higher Education.
9. Bureau of Indian Standards. (2005). Code of Practice for Electrical Wiring Installations IS-732.
10. Electrical Wiring & Contracting (Vol.1 to Vol.4).
11. Sawhney, G. S. (2006). Fundamentals of Mechanical Engineering: Thermodynamics, Mechanics and Strength of Materials. New Delhi : Prentice Hall of India.
12. Taylor, E. O. and Rao, V. V. L. (1971). Utilisation of Electric Energy in SI units. Bombay : Orient Longman.
13. Willim, J. McG. (1971). Mechanical & Electrical Equipment for Buildings.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH507-21	**Surveying and Levelling -I**	2	1	40	60	3	03 Hrs

Course Objective: To study the distinct methods of surveys, levelling. Study contouring and its elements

UNIT-I: Surveys:-

Chain Surveying:- Principal, equipment used, Methods of chaining, base line and stations, obstacles in chaining. Location of inaccessible points by chain.
Prismatic Compass survey: - Prismatic & Surveyors compass methods of traversing, adjustment of closing error by graphical method.
Plane Table survey: - Different equipment & methods of plane tabling,

UNIT-II: Levelling: -

Definitions, methods of levelling, dumpy level, levelling staff, Temporary adjustment of a level, Theory of direct levelling, Differential levelling. Theodolite & its structure, Measurements of horizontal angles.

UNIT-III: Contouring: -

Contour interval, Characteristics & Interpolation of contours, contours gradient, Use of contours maps, computation of volume of earth/ Areas from contour plans, Use of Plani-meter.

UNIT-IV: Total Station and GPS

Introduction, components, Operation, Advantages/ Disadvantages, GPS, Aerial Surveying, GIS and Remote Sensing.

Course Outcomes:

- To make students understand and learn about and basics of surveying and levelling and its application in the art and science of designing buildings.

Teaching Methodology

Subject shall be taught by a teacher who has practical experience of carrying out field surveys while working on Architectural /Engineering Projects. The teaching shall be supported by undertaking actual surveys of any area/ building in and around the campus to give exposure to the students. All the equipment, stated above, shall be made available to the students by setting up a Survey lab.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Singh, Narinder., “Surveying & levelling”.
- Kanetkar, T.P.,”Surveying & levelling”.
- Punmia, B.C., “Surveying & levelling”.
- Kuchhar, C.L., “Surveying & levelling”.
- Sahiwney, P.B., “Surveying & levelling.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH508-21	**Elective-1 Interior Design-I**	2	1	40	60	2	03 Hrs

Course Objective: To understand and appreciate the complexities and constraints in the design and execution of architectural interiors.

UNIT-I: Interior -Historical perspective

Introduction to Interior Design, Interior Design and architecture, Interior Design Process, themes and Concepts Significance of spatial organization, perceptual & psychological needs convenience, maintenance, durability and image in interior design.
A Brief historical perspective of Interior Design in various periods Renaissance, Baroque periods, modern design

UNIT-II: Interior- Elements and Principals

Elements & Principles of aesthetic composition in interior design. Other interiors accessories used for enhancement of interiors – paintings, objects of art, Interior furnishings i.e. shades, blend, curtains etc. Treatments applied to floors, walls, partitions and ceilings for interior design. Specials Effects of Colour & texture in the interiors ,its psychological impact and various Colour Schemes

UNIT-III: Interior- Material and Services

Traditional and modern building materials for interior finishes. Use of materials and various methods of their treatment to obtain certain specific, functional, aesthetic and psychological effects. Application of different types of interior lighting, the lighting effects, types of lighting fixtures.
Electrical and mechanical services and their integration into interior design schemes.

UNIT-IV: Interior – Layout

Built-in furniture and movable furniture. Furniture selection in relation to human comforts, functions – materials, methods of construction, upholstery. Making a detailed layout of all the planar surfaces of a house (various rooms – offices, children's rooms, bedrooms, lounge etc.) for understanding the treatment of over-head, lateral and transverse planes.

Course Outcomes:

- This subject plays the vital role in creating the strong mind set regarding visualization of the students towards the designing of internal spaces in the field of architecture.
- The student can also become an entrepreneur specifically in the field of interior designing. The vast knowledge of interior designer will enrich the utility and quality of interior space.

Teaching Methodology

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology
References:

- *Allien Tate, C Ray Smith; "Interior Design in 20th Century"; Harper and Row, New York, 1986.*
- *Ching, Francis.D.K.; "Interior Design Illustrated"; V.N.R. Publisher, New York, 1987*
- *Evans, Helen Maries; "An Invitation Of Design"; MacMillan Publishing Company, New York, 1982*
- *Karthryn, B. Hiesinger and George H. Marcus; "Landmarks of 20th Century Design", Abbey Villey Press, 1999)*
- *Karl J Neilson, David A Taylor; "Interiors- An Introduction"; McGraw Hill Higher Education, USA, 2010.*
- *Penero, Julius and Zelnik, Martin; "Human Dimension and Interior Space"; Whitney Library of Design, New York, 1979*
- *Riggs, J Rosemary; "Materials and Components Of Interior Architecture"; Prentice Hall, 1998*
- *Steport- De- Van Kness, Logan and Szebely; "Introduction To Interior Design"; MacMillan Publishing Company, New York, 1980*
- *Syanne Slesin and Stafford Ceiff, "Indian Style 3", Clarkson N. Potter, New York, 1990*

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH509-21	**Elective -I Product Desing-I**	2	1	40	60	2	03 Hrs

Course Objective: To comprehend and integrate the functionality, safety and aesthetics in product designing and sensitized towards the eco-friendly materials & products

UNIT-I: Introduction

Introduction to Product Design, Development of product design concepts - a historic review. Elements of design – visual grammar and principles of design. Different techniques for form studies.

UNIT-II: Ergonomics in Product Desing

Application of ergonomics in human-product interaction. Design of ergonomic model for specific user-problem. Usability study of product form.

UNIT-III: Product Design Exercise

Different techniques to study different user group, Understand the context of use. Understand the user problems through various methods. Quality function deployment, Formation of design requirements SWOT Analysis, different product design methods.

UNIT-IV: Product Design Exercise

Application & properties of various types of materials for various aspects of product design. Different types of model making techniques and their application at different stages of product design. Different presentation techniques of final concept of product.

Course Outcomes:

- At the end of the course the student will be able to appreciate the design principles in product segment and learn the design methods and techniques of product designing. Psychomotor Articulation will enable the students to develop entrepreneurial skills as well as soft skills.

Teaching Methodology

• The subject is integrated to subjects like Design, Graphics, Art Appreciation and CAD or with a small component of design exercise with the current or any of the previous semester design works.
• The course will include one or several exercises in relation to context of use study, market surveys, presentations, reports, etc.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

• *Elements of Design by Anderson, Donald M., Holt-Rinehart and Winston, New York (1961)*
• *Ergonomic for beginners by Jan Dul, B. A. Weerdmeester, -CRC (1993)*
• *Kathy Baxter and Catherine Courage, Understanding your users: A practical guide to user requirements methods, tools,*
• *Karen O'Reilly, Ethnographic Methods*
• *John Chris Jones, Design Methods,Module Contents*
• *Chris Lefteri, Materials for Design*
• *Andrew H. Dent and Leslie Sherr, Material Innovation:*
• *Martha Sutherland, Model Making: A basic guide*
• *Norman Trudeau, Professional Modelmaking: A handbook of techniques and materials for architects and designers*

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH510-21	**Elective -I Furniture Design-I**	2	2	40	60	2	03 Hrs

Course Objective: To comprehend and integrate the functionality, safety and aesthetics in product designing and sensitized towards the eco-friendly materials & products

UNIT-I: Introduction

Introduction to Furniture Design styles- antique, traditional, modern, contemporary, classical etc. Study of Furniture Design Style to exemplify the method to understand the art form and appreciate them in the context of culture, Understand ergonomics and human anthropometrics

UNIT-II: Trends in Interior Design

Current trends in furniture design. Types of furniture like built-in (cabinetry etc.), modular, manufactured, custom-made for seating, storage, sleeping, street furniture and office furniture.

UNIT-III: Materials

Study of materials in furniture – timber, plywood, bent wood, bamboo/cane, metal, plastics, polyurethane and glass. Upholstery materials – leather, natural and synthetic fabrics. Study type of finishes like laminate, veneer, lacquer, varnish, stains, polish and 100 adhesives.

UNIT-IV: Furniture Design

Understanding selection of furniture, cost and longevity. Study of technology, wood joinery, sections, framework, detailing. Design furniture using found object. Design project like furniture layout, relationship to context and design of furniture.

Course Outcomes:

Use of furniture to reinforce interiors and to develop additive interest among students

Teaching Methodology

• The subject is integrated to subjects like Design, Graphics, Art Appreciation and CAD or with a small component of design exercise with the current or any of the previous semester design works.
• The course will include one or several exercises in relation to context of use study, market surveys, presentations, reports, etc.

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each part and student would be required to attempt minimum one question from each part.
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology
References:
• *Elements of Design by Anderson, Donald M., Holt-Rinehart and Winston, New York (1961)* • *Ergonomic for beginners by Jan Dul, B. A. Weerdmeester, -CRC (1993)* • *Kathy Baxter and Catherine Courage, Understanding your users: A practical guide to user requirements methods, tools,* • *Karen O'Reilly, Ethnographic Methods* • *John Chris Jones, Design Methods, Module Contents*

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorail	int	ext		
BARCH511-21	**Mentoring and Professional Development-III**	-	-	50	-	NS	NO Exam

Course Objective:

The objective of mentoring will be the development of: Overall Personality Aptitude (Technical and General) General Awareness (Current Affairs and GK) Communication Skills. Presentation Skills. The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are

UNIT-I: Class Activies

Expert and video lectures, Aptitude Test, Group Discussion, Quiz (General/Technical), Presentations by the students, Teambuilding Exercises etc.

UNIT-II: Outdoor Activities

Participation in Sports/NSS/NCC activities. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc

Teaching Methodology

Evaluation shall be based on rubrics for Part – A & B. Mentors/Faculty in charges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH512-21	**Institutional Summer Vocational Training**	-	-	50	-	1	NO Exam- Internal Viva Voce

Four (04) weeks Institutional Summer Vacation Training after 4th semester for B. Architecture program

Course Objective: *The training is compulsory and is for the orientation of the students of the B. Architecture so that they are aware of/can identify the industrial, departmental, environmental, societal and other issues that are a challenge in the society and develop the ability to find solutions.*

UNIT-I:

Extra Skill – 3D Software learning -Self learning Mode

50 Hours

UNIT-II:

Study and visit to Construction Site and document the whole process of construction of up to G+4 storey Building.

60 Hours

UNIT-III:

Student shall do Market Survey for availability and rates of Construction materials available in the market along with samples.

140 Hours

Course Outcomes:

Evaluation Methodology

i) Four (04) weeks Institutional Summer Vacation Training after 4th semester is a compulsory having One Credit course.
ii) The students are required to maintain a daily dairy and submit it along with the "Problem formulation report".
iii) Student falling short of 75% attendance criterion is required to repeat the training with next batch.
iv) Continuous evaluation to be done and proper record to be maintained.

Submission Criteria

The students need to submit a summary report along with sheets of the institutional training of Module I-II.A detailed report/ scrapbook of inventory and market survey done in Module III.

The viva exam for the subject will be conducted along with the practical exams of the End-Semester Examination of Fifth Semester.
References:

IKG PUNJAB TECHNICAL UNIVERSITY

BACHELOR OF ARCHITECTURE – 2021 SCHEME

6th Semester Study Scheme

TOTAL CREDIT – 27
TOTAL CONTACT HOURS- 29

Course Code	Course Name	Contact Hours				Total Marks		Credits	Univ. Exam (Hours)
		L	S	T	P	internal	external		
BARCH601-21	**Architectural Design- VI**	1	7	0	0	60	40	8	12 +Ext Viva Voce
BARCH602-21	**Building Construction -VI**	1	4	0	0	60	40	5	04
BARCH603-21	**Estimating and Costing**	2	0	1	0	40	60	3	03
BARCH604-21	**Architectural Legislation**	2	0	0	0	40	60	2	03
BARCH605-21	**Structure Design-Project**	1	0	2	0	50	50	3	No Exam External Viva Voce
BARCH606-21	**Building Services-III**	2	0	0	0	40	60	2	03
BARCH607-21	**Environment Science-I**	2	0	0	0	40	60	2	03
BARCH608-21 BARCH 609-21 BARCH610-21	**Elective-II** **Building Information Modelling** **Computational Design** **Remote Sensing and GIS**	1	0	0	2	60	40	2	No Exam Internal Viva Voce
BARCH611-21	**Mentoring and Professional Development-IV**	0	0	1	0	50	0	S/NS	Non-Credit
TOTAL		**12**	**11**	**4**	**2**			27	

12th Jan 2024

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH601-21	**Architectural Design - VI**	1	5	60	40	6	12 Hours + Ext viva-voce

Course Objective: To make students understand and appreciate the constraints in the designing of a building in an urban setting with respect to socio-cultural, climate and local development norms. The focus of the studio is on functionality and integration of advanced technology and services. The studio enables understanding the complex mechanisms of designing services intensive buildings in tight urban context, having multiple levels (above and/or underground). The special emphases are on, space optimisation, conformance with regulatory requirements, integration of structural systems and building services (HVAC, fire, electrical, communication, plumbing etc.)

UNIT-I: Multi-functional and Multipurpose commercial buildings

Focus should be to design the Building like Auditorium, Cinemas, Theatres, Multiplex. Emphasis on the design of services intensive, multi-storeyed, buildings in tight urban spatial context, such as buildings for multifunctional commercial usage. Design focuses on closed environment, with emphases on interior spaces, integration of various services, and conformance with regulatory norms.

UNIT-II: Multiple user/Multiple Functional Housing

Study of an urban complex as a prototype so as to have a basic knowledge of various aspects in planning with focus on urban activity, services and construction methods along with social aspects, growth and change.

There could be two design exercises: low-rise high-density housing and high-rise, high-density housing. While designing socio-economic determinants, regulatory and technological alternatives shall be studied in detail. Exercises in simulation and conceptual modelling shall be conducted. Application of concepts of project phasing, financing and construction planning are to be applied.

Course Outcomes:

With the successful completion of the course student should have capability to: Design closed environment buildings for a specific purpose for a multiple group of users. Understand and design for energy efficiency. Produce a design process and design output for a specialized building type.

Teaching Methodology

Minimum two projects/ assignments to be handled by the students individually. Library and prototype studies should be carried out for other projects in groups. Model and perspective should be made integral part of project presentation. Stress should be laid on the understanding the basics of process of design.

Guidelines for Paper Setter

- One compulsory question is to be set from the entire syllabus.

Evaluation Methodology

- Evaluation is to be done through viva voce by external jury appointed by the college in consultation with the university from the approved panel list of examiners.
- Answer sheets should be retained at college level for the viva voce examination.

- ***The topic of the project is to be displayed on College / Institute Notice Board ten days in advance.***

References:

- Ching, Frank D.K., "Architecture: Form, Space & Order", John Wiley, Hoboken,2007.
- Parmar, V.S., "Design Fundamentals in architecture", Somaiya Pvt. Ltd, Mumbai,1997
- Vandyke, Scott., "From Line to Design", Van Nostrand Reinhold,1990.
- E&OE., "Architects Hand Book and Planning", llife & Sons Ltd, 1963.
- Watson, Donald, Crosbie, Michael J., "Time-Saver Standards for architectural design", McGraw- hill education, 2001.
- Dechiara, Joseph, Crosbie, Michael J., "Time-saver standards for building types", McGraw-hill education, 2001.
- Panero, Julius, Zelnik, Martin., "Human Dimension and Interior Space", Whitney Library of Design, 1979.
- DeChiara, Joseph, Panero, Julius, Zelnik, Martin., "Time Saver Standards for Interior Design and Space Planning", McGraw Hill, 2001.
- Neuferts, Ernst., "Architects Data", Blackwell, 2002.
- Sleeper, Ramsey., 'Architectural Graphic Standards', Wiley, 2000.
- Miller, Sam F., 'Design Process: A Primer for Architectural and Interior Design', Van Nostrand Reinhold, 1995.
- Rewal, Raj., "Humane Habitat at Low Cost", Architectural Research Cell, 2000.
- Steele, James., "The Complete Works of Balakrishna Doshi: Rethinking Modernism for the Developing World", Super Book House, Mumbai, 1990.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH602-21	**Building Construction- VI**	1	3	60	40	4	04 Hours

Course Objective: To make students understand the essential components of working drawings, notations, drawing standards and to strengthen them with their significance in the construction building. To train the students to prepare detailed Working drawings for effective execution at construction site, preparation of integrated services drawings, and detailing for various types of drawings.

UNIT-I: Working Drawings

Introduction to working drawings: shop drawings / vendor drawings. Fundamental elements in a "Working Drawing-Plan". Various formats for working drawing preparation.

Working drawing details -Preferably Residential or small commercial buildings:
Key plans, General Arrangement Plans, Part plans, Roof Plan / Terrace Plan.
Demarcation plan & Excavation drawings, Foundation drawings and Foundation details, Centre-line drawings, Floor Plans, Sections, Elevations. Working/ dimensions at all floor levels.

UNIT-II: Working Drawings

Basic internal electrical, plumbing and Sanitary drawings. Joinery Details, Toilet Details, Kitchen Details, Staircase Details.

UNIT-III: Working Drawings

An overview of site marking procedure, "techniques/thumb rules" to ensure effective translation from "working drawings" to actual site execution, and developing Site Plan , Site Marking Plan , Site Grading / Levelling Plan., Integration with schedule of joinery, schedule of hardware, finishing materials, method of dimensioning, appropriate section line markings. Developing elevations, sections, part sections, wall sections integrated with finishing materials, etc.

UNIT-IV: Scaffolding, Shoring and Underpinning

Temporary construction work. Shoring, Underpinning, Retrofitting and strengthening of foundation. Scaffolding of multitoned buildings.

Course Outcomes:

With the successful completion of the subject the student should be able to :
1. Develop and convert the design intent into a set of good for construction drawings.
2. Be able to read working drawings
3. Communicate with consultants and construction team.
4. Understanding the method of executing of scaffolding

Teaching Methodology

Site visits to construction sites. Market study of the products available under different trade names with details of their manufacture, specification and performance. All efforts must be directed to make the learning an enriching experience.

An overview of "all service systems integrated drawings" and the effectiveness of "Building Information modelling – BIM " to achieve the same.

Guidelines for Paper Setter

- Two questions are to be set from each unit and students would be required to attempt minimum one question from each unit.
- Students would be required to attempt four questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Mitchel,G.A., "Elementary Building Construction", B T Batsford Ltd, London , 1961.
- Punmia B.C., "Building Construction", Laxmi, 2016.
- .Mckay, W.B., "Building Construction (Vol 1-4)", Longmans, U.K 1981.
- Barry, R., "Construction Of Buildings (Vol. 1-4)", Oxford: Blackwell Scientific, 1999.
- Chudley, R., "Construction Technology (Vol. 1-4) Longmans", Uk 1981.
- Ching, Frank D.K., "Building Construction Illustrated", John Wiley, New York 2003
- Building and Construction Authority. (2005). CONQUAS-21. Singapore : The BCA Construction Quality Assessment System.
- Jefferis, A. and Madsen, D.A. (2005). Architectural Drafting and Design. 5th Ed. New York : Thomson Delmar Learning.
- Jeong, K-Y. (2010) Architecture Annual. Seoul : Archiworld Co.
- Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria : The Images Publishing group.
- Osamu, A. W., Linde, R. M. and Bakhoum, N. R. (2011). The professional practice of architectural working drawings. 4th Ed. Hoboken : John Wiley & Sons.
- Weston, R. (2004). Plans Sections Elevations – Key buildings of the twentieth century. London :

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH603-21	**Estimating and Costing**	2	0	40	60	2	03 Hrs

Course Objective: This course is intended to impart students with the necessary technical knowledge for preparation of Specifications and calculating estimates and detailed costing for small to medium scale projects

UNIT-I: Estimating

Introduction to Quantity estimation, costing and specifications related to building projects. Definition of estimating and costing.
Introduction to measurement of various construction work items, importance and significance in construction projects i.e. Units of measurement, rules for measurement, Methods of taking out quantities- Long wall and short wall method, centre line method, partly centre line, cross wall method. Standard modes of measurement asper Indian Standards for various work items.

Preliminary/Approximate Quantity Estimates: Importance & purpose of Preliminary / Approximate estimates, Plinth area method, Cubical contents method and centre line method and their preparation. Types of approximate estimates, basic differences and advantages. Detailed Quantity Estimation: Types of detailed estimates and their application, Methods of deriving detailed quantities for various construction work items. Preparation of Detailed estimate, Work items as per construction stages: Foundations, Superstructure, Finishing works in a simple building. Description & significance of Items in Bill-of-Quantities (BOQ).

UNIT-II: Estimation of Materials and Rate analysis

Preparing estimates of quantities of materials for various items of work e.g. earthwork, brickwork, flooring, roofing etc- units of measurements and payments. Analysis of rates of material and labour required for various items of work. Bill of Quantities-Methods of taking out the quantities of R.C.C. construction.

UNIT-III: Specifications

Introduction, Definition, importance and purpose of specifications, impact on costing. Principles and practices. Types of specifications. Knowledge of manufacturers' specifications for construction materials/products. Specification of common building materials including carriage & stacking of materials. Specifications for a simple building. Standard specifications of BIS. General abbreviations used in specifications. Specification of new building materials.

UNIT-IV: Case Studies

Case study/practical exercise in preparing a detailed estimate of a two storeyed residential building with respect to the quantities of material and labour required as well as analysis of rates for material and labour. Introduction, importance, Role, Functions and Types of Specifications Detailed Specifications for various basic building materials

Course Outcomes:

At the end of the course, the students will able to prepare detailed estimates and cost of two-storeyed residential buildings in masonry and reinforced cement concrete.

Teaching Methodology
• Teaching in the subject shall be a combination of lectures by subject Experts, class room exercises, Market Surveys.
Guidelines for Paper Setter
One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus. • Two questions are to be set from each unit and student would be required to attempt minimum one question from each unit. • Student would be required to attempt five questions in all including compulsory question. • Question paper is to be set covering entire syllabus by making parts and mixing the topics.
Evaluation Methodology
References:
• Upadhay, A.K., "Civil Estimating, Costing and Valuation", S. K. Kataria Sons, 2009. • Namavati, Roshan H., "Estimating, Costing and Valuation", UBS Pvt. Ltd., 2016. P.W.D. Specification • Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing. • Chakraborty, M. Estimating, Costing, Specification & Valuation • C.P.W.D. Standard Schedule of Rates. 3. Dutta, B. N. (1998). Estimating and Costing in Civil Engineering. 24th Ed. UBS Publishers

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial/ Studio	int	ext		
BARCH604-21	**Architectural Legislation**	2	0	40	60	2	03 Hours

Course Objective: To make students familiar with the role and importance of Legal Framework in Designing the Built Environment and Promoting orderly growth of Human Settlements.

UNIT-I: Need of Law

Need, Role and Importance of Legislation in the Building Industry, Building Bye- laws-- Contents and Scope

- Study of Building Bye- laws Chandigarh- Intent and Contents,
- Study of Building Bye- laws, PUDA- Intent and Contents
-

UNIT-II: Municipal Byelaws

- Study of Municipal Building Bye- laws - Intent and Contents
- Architectural Controls- Need, Typology, Contents and Applicability
- Introduction to various Acts- Periphery Control, Property Regulation Act, Regional and Town Planning Act, Chandigarh Capital Act, Heritage Conservation Act.
- RERA Act

UNIT-III: Approval of Buildings

- Requirements of Submission of Documents/ Drawings for approval of Building Plans in Chandigarh, PUDA, Local Bodies
- Completion/ Occupation Certificate for Buildings- Need and Procedure
- Preservation and Conservation of Heritage Buildings, Heritage Regulations

UNIT-IV: Building Codes

- National Building Code, - Study of Important Definitions , Types of Buildings,
- Protection of Industrial/ Multi-Storeyed Buildings against Fire etc w.r.t. National Building Code
- Disability Act

Course Outcomes:

At the end of the course, the students will able to understand need for building byelaws, importance of legislation in building industries and NBC norms.

Teaching Methodology

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each unit and students would be required to attempt minimum one question from each unit
- Student would be required to attempt five questions in all including compulsory question.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology
References:
• Chandigarh Administration., “Building Bye Laws”, 2017. • PUDA., “Building Bye Laws”. • Municipal Building Bye Laws. • Rangwala., “Town Planning”,Charoter, 1990. • BIS, “National Building Code”, 2016. • Institute of Town Planners, India., “Readers Volume in Town planning”

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH605-21	**Structure Design - Project**	1	2	50	50	3	No Exam External Viva

Course Objective: To create skill among students to apply the knowledge gained regarding structural design in an applied project and to make buildings safe against natural/ manmade disasters

UNIT-I:

Detailed Structural Design & Drawings of a Public /Residential Building, (R.C.C. frame structure) with emphasis laid on practical design considerations.

UNIT-II:

Earth quake Resistant Design.
Introduction to Codal provision, IS- 4326 and IS- 1893 for Earth quake Resistant Design of Buildings.
Earth quake Resistant provisions for Brick Masonry& R.C.C. Buildings.

Course Outcomes:

At the end of the course, the students will able to – design RCC Beams, Slabs, Columns, and footings with different loads for one-story simple buildings.

Teaching Methodology

Student shall prepeare report consisting detailed structure design of building considering all safety factors including fire, earthquake, cylone, flood, etc.
Report to be prepared in bound form with drawing attached of structure of single story.

Guidelines for Paper Setter

No Exam, only vivia of the projects.

Evaluation Methodology

- Evaluation is to done through viva voce by the external examiner appointed by the college in consultation with the university from the approved panel list of examiners.

References:

IS-456 CODE
IS-800 CODE
IS-4326 CODE
IS-1893 CODE

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH606-21	**Building Services-III**	2	0	40	60	2	03 Hrs

Course Objective: The objective of the subject is to develop the understanding of important Services in buildings, definitions and terms used, functioning and their applications in building. The objective of the subject is to enable students to understand and apply: Basic laws and terminologies related to Acoustics, Acoustical requirements of a given activity, its calculations and designing of the space. Enable students to understand and apply: Overview and introduction to heating, ventilation, and air conditioning focusing on different HVAC systems. HVAC requirements for given situation, its calculations and design.

UNIT-I: Air Conditioning

Air conditioning--Role, Importance and Principles governing Air conditioning Refrigeration Cycle, Air cycle, Cooling Load Methods of Cooling and Heating-Evaporative Cooling etc Types of Air Conditioning Systems-Unit and Central Standards and location of various parts- Plant, Ductwork, Fan ,Filters, Outlets, Dampers, Natural and Artificial Ventilation

UNIT-II: Acoustics

- Acoustics- Introduction, Role, Importance, Concept, Basic Principles of Design,
- Sound- Basic principles governing transmission, reverberation, absorption, reflection etc.
- Acoustics-Materials- application, advantages and disadvantages
- Acoustics in Buildings- Design considerations for various buildings including Class Room, Studio, Lecture Theatre, Auditorium, OAT etc

UNIT-III: Building Automation/ Building Management System

Concept and application of Automation Systems in buildings. Design issues related to building automation and its effect on functional efficiency. Components of building automation system integrating HVAC, electrical, lighting, security, fire-fighting, communication etc. Current trend and innovation in building automation systems; Knowledge base and decision support systems and building automation and management system; Application of expert system in building automation.

UNIT-IV: Intelligent Buildings

Intelligent Buildings- Concept, applicability and limitations
Introduction to the historical development of intelligent buildings
Description, definition and components: development of European and world modes: Key stakeholder analysis: Integrated course framework
Components of the intelligent building
Building and business systems: Systems integration and interoperability: Building aspects: Site, structure, skin, services, space plan and stuff/set factors. Building and facilities Management, organisation and systems, Changing building usage

Course Outcomes:

At the end of the course, the students will able to :

- With the successful completion of the course student should be able to Understand the basics of acoustics. Develop capability to apply the fundamentals of acoustics in the design of building. Communicate with technical accuracy in a professional and an academic environment.
- With the successful completion of the course, student should : Understand principles for designing of large scale mechanical services. Understand BMS and their execution in building projects. Have capability interact technically with MEP experts.
- Understand the importance of intelligent buildings

Teaching Methodology

Teaching in the subject shall be a combination of lectures by subject Experts, Site visits and Schematic layout exercises.

Guidelines for Paper Setter

One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.

• Two questions are to be set from each unit and student would be required to attempt minimum one question from each unit.

• Student would be required to attempt five questions in all including compulsory question.

• Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Evaluation Methodology

References:

- Barry, R., "Building Servicies", John Wiley and Sons Ltd, 1998.
- B.I.S., "National Building Code",2016.
- TERI, "Sustainable Building Design Manual",2009.
- Jain, V.K., "Handbook of Designing and installation of Services in Buildings", Khanna publishers, 2000.
- Basak, N.N., "Environmental Engineering", McGraw Hill Education, 2017
- Stein, Benjamin., "Mechanical and Electrical Equipment for Buildings", Wiley, 200
- Abnwos, F. and Others. Electrical Engineering Hand Book.
- Bovay, H. E. (1981). Handbook of Mechanical & Electrical systems for Buildings. McGraw-Hill Higher Education.
- Bureau of Indian Standards. (2005). Code of Practice for Electrical Wiring Installations IS-732.
- Electrical Wiring & Contracting (Vol.1 to Vol.4).
- Sawhney, G. S. (2006). Fundamentals of Mechanical Engineering: Thermodynamics, Mechanics and Strength of Materials. New Delhi : Prentice Hall of India.
- Taylor, E. O. and Rao, V. V. L. (1971). Utilisation of Electric Energy in SI units. Bombay : Orient Longman.
- Willim, J. McG. (1971). Mechanical & Electrical Equipment for Buildings.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH607-21	**Environment Science-I**	2	0	40	60	2	03 Hours

Course Objective: The objective of the subject is to enable students to understand environmental variables.

UNIT-I: Natural Resources

- Introduction: Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness.
- Natural Resources: Natural Resources and associated problems, use and over exploitation, case studies of forest resources and water resources.
- Ecosystems: Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, ecological pyramids-biodiversity and importance. Hot spots of biodiversity

UNIT-II: Environment pollution

- Environmental Pollution: Definition, Causes, effects and control measures of air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, nuclear hazards.
- Solid waste Management: Causes, effects and control measure of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies.
- Disaster Management: Floods, earthquake, cyclone and landslides.

UNIT-III: Social issues

- Social Issues and the Environment From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of pollution) Act. Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation Public awareness

UNIT-IV: Human Population

- Human Population and the Environment, Population growth, variation among nations. Populationexplosion–FamilyWelfareProgramme.Environmentvandvhumanvhealth, Human Rights, Value Education, HIV/AIDS. Women and child Welfare. Role of Information Technology in Environment and human health. Case studies

Course Outcomes:

Upon successful completion of the course, students should be able to Measure environmental variables and interpret results. Evaluate local, regional and global environmental topics related to resource use and management

Teaching Methodology

Guidelines for Paper Setter

- One compulsory question of short answers type containing 6 questions of 2 marks each (12 Marks) is to be set from the entire syllabus.
- Two questions are to be set from each unit and student would be required to attempt minimum one question from each unit.

• Student would be required to attempt five questions in all including compulsory question. • Question paper is to be set covering entire syllabus by making parts and mixing the topics.
Evaluation Methodology
References:

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Practical	int	ext		
BARCH608-21	**Elective-II Building Information Modelling**	1	2	60	40	2	No exam. Internal Viva Voce.

Course Objective: The main objective of the subject is to Produce 3D computer models of structures using established standards. Understand the transition from 2D to 3D representations. Be able to analyse and extract building information data for a BIM base model

UNIT-I Introduction, Site and Data Extraction

BIM INTRODUCTION: Definition of BIM, history of BIM. BIM on the architecture and engineering disciplines .
SITE & DATA EXTRACTION: Site Topography, Building Pads BIM BASICS: Introduction & modelling, Interface and navigation. 3D drafting: basic model building, Structural grids, support
BIM BASICS: Introduction & Modelling (cont.) Levels, Floors, Roofs, Ceiling, Windows, Doors. Navigation: Ribbon, Sketch Mode, General Interface. Basic dimensions, Building sections, plans and elevations. BIM COLLABORATION: Collaboration in a BIM environment Integrated project delivery Sharing models

UNIT-II: BIM Modelling and Parametric Families

BIM MODELING: Systems Structural systems MEP systems. Circulation (stairs, pathways, etc.) Documentation.
PARAMETRIC FAMILIES: Instance vs. Type Parameters, Massing: In-place mass, Conceptual mass. Families: Loading and using basic families, creating basic families

UNIT-III: Detail Documentation and Rendering

DETAILS AND DOCUMENTATION: Construction details, Detail views, Sheet Organization, and Title block.
DOCUMENTATION AND RENDERINGS: Scheduling, Tags, Table, Legends, Advanced Annotations. 3D Renderings, Materials, Materials Library, Lighting.

UNIT-IV: Architecture and Engineering BIM Collaboration.

ARCHITECTURE AND ENGINEERING BIM Collaboration benefits and limitation Structure: MEP CONSTRUCTION COORDINATION: Principles of Integrated Project Delivery IPD Model integration Identifying and resolving issues

CONSTRUCTION COORDINGATION: Principles of Integrated Project Delivery IPD Model integration Identifying and resolving issues

SOFTWARE ENVIRONMENTS: Software environments and solutions Pros and cons of different BIM tools.

Course Outcomes:

With the successful completion of the subject student should be able to:

- Extract and analyse data from site topography.
- Create basic building models using structural grids and support systems.

- Design basic building components including levels, floors, roofs, etc.
- Employ parametric modelling in 3D design.
- Incorporate the mechanical, electrical, and plumbing systems into the 3D building model.
- Produce the building details and documentation.
- Create high-quality and annotated building section drawings and renderings

Teaching Methodology

The course is structured as a series of individual and group-based projects in which students apply the principles of building information modelling. The course content will be delivered in a computer classroom setting that allows students to immediately apply the acquired knowledge on the relevant BIM software platform.

Guidelines for Paper Setter

Evaluation Methodology

Evaluations will be distributed at intervals during the semester
Evaluations will be based primarily on student's work, rather than effort expended. Students are expected to acquire knowledge and skill, not merely endeavour to do so.

Software for References:

- Wing, Eric. Autodesk Revit Architecture 2017: No Experience Required. Indianapolis: John Wiley & Sons, 2016. 6 rev. 1/10/18
- Kim, Marcus, Lance Kirby, and Eddy Krygiel. Mastering Autodesk Revit 2017 for architecture. 1st ed. INpolis, IN: John Wiley & Sons, 2016.
- Garber, Richard. BIM Design: Realizing the Creative Potential of Building Information Modelling. AD Smart 02. Chichester, U.K.: Wiley, 2004.
- Pressman, Andy. Designing Relationships: The Art of Collaboration in Architecture. New York: Routledge, 2014.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Practical	int	ext		
BARCH609-21	**Elective-II Computational Design**	1	2	60	40	2	No exam. Internal Viva Voce.

Course Objective: The main objectives of the course are to develop an in-depth knowledge and understanding of key concepts of computational design and parametric tools in architecture. To develop an advanced awareness of how the development of digital, computational and parametric tools procures implications on design, structure, construction, shape and form of architecture products.

UNIT-I Introduction to Computational Design

Theoretical Positions on Computational Design in Architecture. Key concepts of Digital Design in Architecture.
Generative Strategies Using data-driven generative modelling strategies to develop siteless landform, enclosure, and ground patterning strategies. (Rhino & Grasshopper)

UNIT-II: Generative Relationships

Generative Relationships: Deploying the generative strategies to a series of three site using arraying techniques and surface projection (Rhino & Grasshopper). 3D Modelling tools Parametric software. Design Optimisation 8. Performance Simulation

UNIT-III: Data Ecologies

Data Ecologies: Analysing the three designed sites created in Module II using introductory and advanced techniques in mapping and data visualization (Rhino, Grasshopper, Ladybug Tools, GIS & Illustrator, tentatively). Growth and Form in Nature. Natural Patterns and their formations

UNIT-IV: Constructed Narratives

Constructed Narratives : Documenting the design process and site impacts over time using animation, notation, and time-based media (After Effects, Grasshopper, etc.)

Course Outcomes:

After completion of the subject students are able to: Demonstrate knowledge and understanding of key concepts of the theory behind the computational design discipline.
Acquire a large vocabulary of established computational techniques, software tools, fabrication systems and the terminology used in these.

Teaching Methodology

PowerPoint and articulate presentations, comparative analysis, self-analysis, self-assessment, individual support and feedback, tutorials, case study analysis

Guidelines for Paper Setter

Evaluation Methodology

ABILITY to UNDERSTAND, ANALYZE, and DISCUSS topics related to computers in architecture and design,

CAPACITY to ANALYZE, INNOVATE and APPLY solutions to problems related to lecture themes, CAPACITY to EXPLORE, INNOVATE and APPLY computational design to design problems.

Software for References:

- AD: Computational Design Thinking Achim Menges, Sean Ahuquist John Wiley & Sons 2011 0470665653
- Finding Form: Towards an Architecture of the Minimal Frei Otto Edition Axel Menges 1996 3930698668
- AD: Design Through Making Bob Sheil John Wiley & Sons 2005 0470090936
- AD: Patterns of Architecture Mark Garcia John Wiley & Sons 2009 0470699590
- Soft Architecture Machines Nicholas Negroponte MIT Press 1975 0262140187
- Lars Spuybroek, L. (2004) NOX: Machining Architecture. New York, N.Y.: Thames and Hudson
- Gerber, Dr. David Jason and Mariana Ibanez, Ed. Paradigms in Computing: Making, Machines and Models for Design Agency in Architecture. eVolo, 2014.
- Kolarevic, Branko. Architecture in the Digital Age: Design and Manufacturing. Routledge: 2005
- Amoroso, Nadia. Representing Landscapes: A Visual Collection of Landscape Architectural Drawings. London: Routledge, 2012
- Klanten, Robert, ed. Data Flow 2: Visualizing Information in Graphic Design. Die Gestalten Verlag, 2010.

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Practical	int	ext		
BARCH610-21	**Elective-II Remote Sensing and GIS**	1	2	60	40	2	No exam. Internal Viva Voce.

Course Objective: To introduce application of remote sensing and GIS for object identification, identification of land use and base map preparation.

UNIT-I Introduction

Study of GIS platform and sensors. Basic principal of GIS. Methods of photo interpretation and techniques of data collection through satellite data. Classification techniques using satellite data, Digital image processing, enhancement techniques in urban information extraction.

UNIT-II: Aerial photography

Aerial photography as a tool for collection of data and preparation of maps, its application in planning and preparation for a project, orientation concept and methodology transformation and adjustment techniques. Experiments in lab, Instruction for making overlays, computation of photo scale, orientation of a stereo pair under a mirror stereoscope. Recognition on aerial photograph of objects indicated on ground photographs

UNIT-III: Detection and identification

Detection, identification and description of defined objects. Use of auxiliary features for object identification. Systematic scanning of a photograph, and object identification. Monitoring urban changes and Mosaic preparation.

UNIT-IV: Analysis

Base map preparation, elementary data analysis using satellite data. Experiments in lab and instruction for making overlays. Study Classification, interpretation and delineation of various land use on satellite data. Study GIS techniques and their application in planning field

Course Outcomes: With the successful completion of the subject student should be able to: Usage of remote sensing and GIS as analytical tool for study of urban area and land use identification and forecast.

Teaching Methodology

Guidelines for Paper Setter

Evaluation Methodology

Software for References:

- P.K. Garg, Principles and Theory of Geoinformatics (ISBN: 978-93-86173-706)
- Joseph G. Fundamental of remote sensing, Universities press New Delhi,(2003)

- Lillesand T.M. and R.W. Kiefer, Remote sensing and image interpretation, John Wiley and sons, New York(1994)
- Jensen J.R., Remote Sensing of the Environment an Earth Resource Perspective, Pearson Education ,Delhi(2007)

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Tutorial	int	ext		
BARCH611-21	**Mentoring and Professional Development-IV**	-	1	50	-	S/NS	NO Exam

Course Objective: The objective of mentoring will be the development of: Overall Personality · Aptitude (Technical and General) General Awareness (Current Affairs and GK) Communication Skills. Presentation Skills

UNIT-I:

Expert and video lectures Aptitude Test Group Discussion Quiz (General/Technical) Presentations by the students ,Teambuilding Exercises

UNIT-II:

Sports/NSS/NCC Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.

Teaching Methodology

The course shall be split into two sections i.e. outdoor activities and class activities.

IKG PUNJAB TECHNICAL UNIVERSITY

BACHELOR OF ARCHITECTURE – 2021 SCHEME

7th Semester Study Scheme

TOTAL CREDIT – 18
TOTAL CONTACT HOURS- one Full Semester

Course Code	Course Name	Contact Hours				Total Marks		Credits	Duration of Training
		L	S	T	P	internal	external		
BARCH701-21	**Practical Training Programme**	Office Hours				350	150	18	One Full semester 1st July 23 to 15 Dec 2023
TOTAL								18	

27th Dec 2023

Course Code	Course Name	Contact Hours		Marks		Credits	Examination
		Lecture	Studio	int	ext		
BARCH701-21	**Practical Training Programme**	Office Hours		350	150	18	External Viva

Intent: To make student learn the intricacies of architecture profession by joining and working with practicing Architects/Architectural firms for one complete semester.

Practical Training Manual

Practical Training Manual:

- The total marks shall be suitable apportioned to assess on regular basis the monthly reports office work and work done outside office hours.
- Students are required to send/submit monthly reports of work done by them reports, office work and work done by them in the office in which they are working according to prescribed schedule. These reports should be assessed/ remarked by practical training coordinator (PTC).

On the conclusion of the training the work done by the students should be evaluated through the viva-voce to be conducted jointly by the director/ principal/ HOD, PTC and one External Examiner, who will be appointed by the Director/ COE/ Principal.

Work to be Done By students:

Work to be done by the students:

- During training, students are required to do distinct types of work in order to make optimum utilization of the period of training.
- Work to be done during office hours: a) Drafting, Tracing, sketch designs, Presentation drawings, Perspectives, models, documentation etc. b) Working Drawings and details.

Distribution of Marks

DISTRIBUTION OF MARKS:

- **University (External) marks – 150.**
- University Viva-Voce – 100. (To be conducted by the external expert appointment by the principle)
- Marks awarded by the employer- 50. (To be sent in original to the Director/ COE/Principal)

- **Internal marks- 350. (To be sent by PTC in the given format)**

Joining reports	20marks
Monthly report	80 Marks
Building study report	125 marks
Seminar/presentation	125 Marks

Evaluation Methodology
EVALUATION MEATHODOLOGY: • Based on above guidelines a detailed programme shall be drawn each year by PTC, which should be approved by the Director/ Principal before it is implemented. The intention will be updating the programme on regular basis, incorporating new details, with focus on making continuous qualitative improvement of the practical training.

IKG PUNJAB TECHNICAL UNIVERSITY
BACHELOR OF ARCHITECTURE
2021 SCHEME

8th Semester Study Scheme

TOTAL CREDIT – 28 TOTAL CONTACT HOURS- 28

Course Code	Course Title	Content	Load Allocations				Marks %		Credits	Duration of Univ. Exam/ Viva-Voce
			L	T	P/S	Total	Int	Ext		Hours
BARCH- 801-21	**Architectural Design - VII**	Skill	2	0	7	09	60	40	**9**	External Viva Voce
BARCH- 802-21	**Building Construction & Materials-VII**	Skill	2	0	3	05	60	40	**5**	03
BARCH -803-21	**Urban Design -I**	Skill	2	1	0	03	40	60	**3**	03
BARCH- 804-21	**Housing – I**	Skill	2	1	0	03	40	60	**3**	03
BARCH- 805-21 BARCH- 806-21	**Elective – IV (any one)** High Rise Buildings-I Advance Building Services	Skill	2	1	0	03	40	60	**3**	03
BARCH- 807-21 BARCH- 808-21 BARCH-809-21	**Elective – V (any one)** Architectural Conservation – I Sustainable Architecture – I Building Maintenance – I	Skill	2	1	0	03	40	60	**3**	03
OE	**Open Elective (anyone from another department)**	Skill	2*	-	-	02*	40	60	**2***	03
	Total		**12**	**4**	**12**	**28**			**28**	

Note: For Open Elective Course,

- Minimum 2 credits are required, however students may opt for any 3 credit subjects, if offered by University/College.
- In case of standalone College/ Department of Architecture student may opt any of the following courses related to AI/ Computational Design/ Parametric Design/3D animation.

B. ARCHITECTURE - VIII SEM.
ARCHITECTURAL DESIGN-VII

Course Code	Course Name	L, ST/T, P	Credits - 9		Duration of Exam
BARCH-801-21	Architectural Design -VII	2 L, 7 ST	Int 60	Ext 40	Portfolio viva voce

COURSE OBJECTIVE: To make students understand the principles and implications of advance and complex design problems with focus on planning, landscaping, energy conservation and services considering zoning regulations.

COURSE OUTCOMES: At the end of the course, the students will able to will be able to:

- understand the principles and implications of advance and complex design problems with focus on planning, landscaping, energy conservation
- design problems with focus on services and considering zoning regulations
- design complex health care academic projects, design for pandemics situations, etc.
- design Terminals of air/railway/bus
- design Light Industrial buildings for different uses.

CONTENTS

The design programme includes:

- Planning and Designing of large Complexes related to **Health care and academic Institutions**-Hospitals cum Medical Colleges etc.
- Planning and Designing of **Traffic Nodes**-Bus Terminal, Railway Station, Airport.
- Light **Industrial Buildings** involving manufacturing, display, etc.

NOTE:

All buildings must incorporate the Universal Design Principles and recommendations.

TEACHING METHODOLOGY

- Minimum Two projects should be done by the student. The Projects selected should be based on realistic contexts.
- The design submitted shall include complete project drawings, perspective, models and details
- Teaching focus will be to promote design concept based on Site, Landscaping, Climate, Energy, Services, Safety and compliance with Building Regulations etc

EVALUATION METHODOLOGY

- External marks shall be awarded through viva- voce conducted by the External Jury appointed by the University of the work done by the student during the semester.

REFERENCE BOOKS:

- Ching, Frank (Francis D. K.) "Architecture: Form, Space & Order". Wiley, Hoboken 2007.
- Parmar V. S. "Design Fundamentals", Somaiya Publisher Pvt. Ltd, Mumbai, 1997
- Scott van Dyke, "Form, Line to Design", Publisher-Van Nostrand Reinhold, 1990.
- Scott R, Design Fundamentals, Publisher-Robart E. Krieger Publishing Company
- E& OE- Architects Hand Book and Planning,
- Donald Watson , Michael J. Crosbie, "Time Saver Standard", 8th edition

B. ARCHITECTURE - VIII SEM.
BUILDING CONSTRUCTION& MATERIALS - VII

Course Code	Course Name	L, ST/T, P	Credits - 5		Duration of Exam
BARCH-802-21	Building Construction & Materials - VII	2 L, 3 ST	Int 60	Ext 40	04 hours

COURSE OBJECTIVE: To make students understand the details of finishes , materials and construction work.

COURSE OUTCOMES: At the end of the course, the students will be able to:

- understand special constructional details,
- understand finishing & furnishing,
- learn the details of extension & expansion joints and
- learn the details of basements with details.

TOPICS

UNIT-I

- Study, design and details of various types of counters and Interior finishes, lighting for Banks, Hotels, Offices, Shops, Railway station and other public places.

UNIT-II

- Materials and Construction details of wall Panelling, False Ceiling including Thermal and Acoustics treatments.

UNIT-III

- Extension and Expansion joints in R.C.C.
- Construction of Basement including design, detailing, treatment for water/damp proofing etc.
- Study of Prefabricated structures.
- Advantages and disadvantages of on-site and off- site pre- fabrication.
- Pre-fabricated components, involving simple details in prefabrication.

TEACHING METHODOLOGY –

Teaching methodology shall be a combination of:

- Field visits to study the interiors and details of the buildings.
- Preparing Construction plates.
- Market study of the products available under different trade names with details of their manufacture, specification and performance.
- Site Visits and details of prefabricated structures

GUIDELINES FOR PAPER SETTER

- Minimum Six questions are to be set from the entire syllabus with Two Questions from each unit.. Student would be required to attempt three questions with minimum one from each unit.
- Question paper is to be set covering whole of the syllabus by making parts and mixing the topics.

REFERENCE BOOKS:

a) Building Materials

- Rangwala S.C, "Engineering Materials, Charotar Publishing House, India

- TTTI, Engineering Materials, Publisher - Tata McGraw-Hill Education, 2001
- Deshpande -Engineering Materials
- National Building Code 2005

b) Building Construction

- MICHELL, Elementary Building Construction, Published by B T Batsford Ltd, London , 1961
- Punmia, B.C. Building Construction
- MCKAY W.B. Building Construction (Vol 1-4) , Longmans, U.K 1981
- Barry, R. "Construction of Buildings (Vol. 1-4) Oxford: Blackwell Scientific, 1999
- Chudley, R., Construction Technology (Vol. 1-4) Longmans, UK John Wiley. 1981
- Ching Francis, D. K., "Building Construction Illustrated, John Wiely, New York 2003

B. ARCHITECTURE - VIII SEM.
URBAN DESIGN-I

Course Code	Course Name	L, ST/T, P	Credits - 3		Duration of Exam
BARCH-803-21	Urban Design-I	2 L, 1T	Int 40	Ext 60	03 hours

COURSE OBJECTIVE: To create awareness and promote understanding of the nature, role and importance of Urban Design in the making of quality Built Environment and Human Settlements

COURSE OUTCOMES: At the end of the course, the students will able to:

- create awareness and promote understanding of the nature,
- role and importance of Urban Design in the making of quality Built Environment and Human Settlements

CONTENTS

UNIT- I

- Introduction, Role, Scope and Importance of **Urban Design**
- Distinction between **Urban Design, Architecture and Town Planning**
- **Elements of Urban Design-** Pattern, Grains, Texture, Density etc, their role and importance.
- **Determinants of Urban Form –** Landform, Climate, Symbolism, Activity Pattern, Socio-cultural Factors, Materials, Techniques etc. and their role and importance.
- **Imagability-** Elements their role and importance including Paths, Nodes, Landmarks Edges, Districts etc
- **Designing Cities-** Role and importance of Communication, Utilities, Landscape Features, Transport, Visual Expression, Size, Contrast, Urban Character etc.
- **Shapes of the Cities-** Comparative advantages and Disadvantages

UNIT- II

- **Urban Spaces**-Typology including Street, Square, Precinct, Piazza, Mall etc
- **Urban Spaces-** Elements, identification, characteristics and role in shaping the spaces
- Changing Role ,Importance and Pattern of **Urban Spaces** in historical perspective- **Greek, Romans, Medieval and Contemporary cities.**
- **Design Principles** involving Scale and Enclosures
- **Development Controls-** Role and Importance in Urban Design.
- **Urban Design study of selected Capital Cities-** Chandigarh, Delhi and Jaipur
- **Legal and Institutional framework** for Urban Design including Delhi Urban Art Commission- Objectives, Constitution, Role, Importance, Impact etc

TEACHING METHODOLOGY

- Emphasis shall be laid on understanding of evolution of Cities and Buildings . Continuous evaluation shall be made of students work based on various assignments and sketching.
- Teaching in the subject will be a combination of Expert lectures, specific case studies and field visits of historical and contemporary cities.
- Students would be required to do, in groups, a case study of a city to make them

understand the various aspects of urban design . The study will be illustrated with maps, visuals, photographs and sketches.

GUIDELINES FOR PAPER SETTER

- One compulsory question of short answer type containing 5 questions of 2 marks each (10 Marks) is to be set from the entire syllabus (4 Marks and 6 marks from unit I and Unit –II respectively)
- In addition, Four questions are to be set from each UNIT.
- Students are required to attempt five questions including compulsory question with two questions from each UNIT.
- Questions paper is to be set covering entire syllabus by making parts and mixing the topics.

REFERENCE BOOKS:

- Spreiregan Paul D**, "Urban Design**: The Architecture of Towns and Cities".
- Gallion Arthur B**, "The Urban Pattern:** City Planning and Design"
- Gupta S.P. "**The Chandigarh**: An Overview"
- Agarwala S.C. **"Architecture and Town Planning" Institute of Town Planner (India) –** Readers Volume

B. ARCHITECTURE – VIII SEM.

HOUSING-I

Course Code	Course Name	L, ST/T, P	Credits - 3		Duration of Exam
BARCH-804-21	Housing - I	2 L, 1T	Int 40	Ext 60	03 hours

Course Objectives:

To make students understand the role, importance and issues related to housing.

CONTENTS

UNIT I

- Role and importance of Housing
- Status of Housing in India
- Housing need, demand and concept of affordability.
- Housing typologies including plotted and flatted development
- Housing surveys including methods of conducting surveys
- Housing- problems and solutions in India
- Housing for the Poor
- Slums -Origin, Growth, Problems and Solutions
- Role of Public and Private Sectors in Housing.

UNIT II

- National Housing and Habitat Policy 2007
- Institutional framework for Housing Finance
- Institutional framework for Housing Delivery
- Factors affecting Cost of Housing
- Basic Housing Norms and Standards for EWS, LIG and MIG

GUIDELINES FOR PAPER SETTER

- Total 8 Questions to be set from both parts.
- Five Questions will be set from Part- I and Three Questions from Part-II.
- Student will be required to answer Five Questions, Three Questions from Part- I and Two Questions from Part – II.
- Attempt will be made to cover the entire syllabus.

REFERENCE BOOKS

- National Housing and Habitat Policy 2007 Rangwala S C, "Town Planning"
- National Building Code, 2005
- Lal A K "Hand book of Low Cost of Housing" ,New Age Publishers Readers Volume on Housing – Institute of Town Planners, India
- Report of Govt. of India on Housing Shortage Journal of IIA, April 2013

B. ARCHITECTURE - VIII SEM.

HIGH RISE BUILDINGS-I

(Elective IV)

Course Code	Course Name	L, ST/T, P	Credits - 3		Duration of Exam
BARCH-805-21	High Rise Buildings-I	2 L, 1T	Int 40	Ext 60	03 hours

Course Objectives: To make students aware and understand the context of planning, designing and construction of High Rise buildings and their role and importance in shaping the Human Settlements and Urban Form in the Modern Context.

CONTENTS

UNIT I

- **High Rise Buildings**- Introduction, Historical perspective, Origin, Definition, Role, Importance , Limitations, Advantages and Disadvantages
- **Planning /Designing** of High Rise Building
- **Construction** of High Rise Buildings
- **Building Technologies** used in the Construction
- **Building Materials** used in the Construction

UNIT II

- Study of **Building Services** in the High Rise Buildings
- **Fire Safety and Structural safety** of High Rise Buildings
- Study of **Legal Framework** governing the High Rise Buildings
- Study of **National Building Code**, 2005
- Study of famous **High Rise** Buildings-Burj Khalifa, Sears Towers, Empire State Building, World Trade Centre, Imperial Towers and Orchid Woods Mumbai .

TEACHING METHODOLOGY

- Teaching in the subject will be a combination of invited lectures , visit to Multi-Storyed/ High Rise Buildings and library studies/power point presentations of High Rise Buildings mentioned above.

GUIDELINES FOR PAPER SETTER

- One compulsory question of short answer type containing Five questions of 2 marks each (10 Marks) is to be set from the entire syllabus (4 Marks and 6 marks)
- In addition , Four questions are to be set from Each Unit .
- Students are required to attempt Five questions including compulsory question with minimum One question from each UNIT.
- Questions paper is to be set covering entire syllabus by making parts and mixing the topic

B. ARCHITECTURE - VIII SEM.

ADVANCE BUILDING SERVICES-I

(Elective IV)

Course Code	Course Name	L, ST/T, P	Credits - 3		Duration of Exam
BARCH-806-21	Advance Building Services-I	2 L, 1T	Int 40	Ext 60	03 hours

Course Objectives:

- To provide in-depth knowledge of advanced building systems, including HVAC, electrical, plumbing, fire safety, and automation.
- To integrate building services with sustainable and energy-efficient design practices.
- To equip students with skills to design, evaluate, and manage building services in complex projects.

CONTENTS

UNIT I: Advanced Building Services and Building Automation

- Overview of building services and their integration into architectural design.
- Role of advanced building systems in modern architecture.
- Introduction to codes and standards (e.g., NBC, ECBC, IGBC, GRIHA).
- Introduction to building automation systems (BAS) and IoT.
- Integration of smart technologies for lighting, HVAC, and security.
- Role of AI and machine learning in building management systems.
- Future trends in intelligent building design.
- **Additional Exercise –**
    - Case Studies: Analysis of iconic Indian buildings with advanced systems (e.g., Infosys Bangalore Campus).
    - Practical Demonstration: Developing a conceptual smart building system.

Unit II: HVAC Systems and Electrical Systems (2 Weeks)

- Principles of heating, ventilation, and air conditioning.
- Types of HVAC systems: central, split, VRF, etc.
- Design considerations for energy efficiency and indoor air quality.
- Applications in residential, commercial, and industrial buildings.
- Basics of electrical systems: distribution, lighting, and safety.
- Smart grids and renewable energy integration.
- Design of lighting systems for various building types.
- Electrical load calculation and management.
- **Additional Exercise –**
    - Hands-On/Software: Introduction to HVAC design tools like Carrier HAP.
    - Case Studies: Energy-efficient lighting design in Indian buildings.

UNIT III: Plumbing, Water Systems and Fire Safety Systems

- Water supply systems, rainwater harvesting, and wastewater management.
- Plumbing design for high-rise buildings.
- Greywater recycling and treatment technologies.
- Sustainable water management practices in urban settings.
- Basics of fire safety: prevention, detection, and suppression.
- Firefighting systems: sprinklers, hydrants, alarms.
- Fire safety codes and evacuation strategies.
- Integration of fire safety into architectural design.
- **Additional Exercise –**
    - Practical Assignment: Design a water supply and plumbing system for a given building layout.

- Case Studies: Fire safety audit of a university building.

TEACHING METHODOLOGY

- Teaching in the subject will be a combination of invited lectures, case studies, site visits, etc. Student must be encouraged to complete any one of the additional exercises mentioned in each unit either individually or in groups as applicable.

GUIDELINES FOR PAPER SETTER

- One compulsory question of short answer type containing Six questions of 2 marks each (12 Marks) is to be set from the entire syllabus covering all the important topics.
- In addition , two descriptive type questions are to be set from each Unit (total six questions) carrying 12 marks each. .
- Students are required to attempt Five questions including compulsory question with minimum One question from each UNIT.
- Questions paper is to be set covering entire syllabus by making parts and mixing the topic

B.ARCHITECTURE - VIII SEM.
ARCHITECTURAL CONSERVATION-I
(Elective V)

Course Code	Course Name	L, ST/T, P	Credits - 3		Duration of Exam
BARCH-807-21	Architectural Conservation-I	2 L, 1T	Int 40	Ext 60	03 hours

Course Objectives: To promote understanding and importance of the Historical buildings and their preservation and conservation.

CONTENTS

UNIT-1

- Heritage- Introduction, Definition, Role, Importance, Scope and Limitations
- Study of basic historical styles in Indian Architecture.
- Study of ornamentation and detailing in historical buildings in various styles.
- Study of construction methods and structural analysis of various historical building styles e.g. Arches Domes, Vaults and Shikharas etc.

UNIT-II

- Study of finishes in historical buildings.
- Effects of weathering/ pollution on historical buildings.
- Study of landscaping style/ Plantation around historical buildings.
- Knowledge of plantation/ water features in Mughal Garden and Hindu Temples.

UNIT-III

- Methods of studying and documenting historical monuments in the context of guidelines issued by UNESCO, INTACH.
- Methods of saving monuments from vandalism.
- Study of existing Legal framework to protect Heritage and its limitations
- Institutional framework to protect Heritage

TEACHING METHODOLOGY

- Emphasis shall be laid on understanding of Architectural Conservation. Continuous evaluation shall be made of students work based on various assignments and sketching.
- Teaching in the subject will be a combination of Expert lectures, specific case studies and field visits of historical and contemporary buildings/complexes.
- Students would be required to do, in groups, a case study of a historical building to make them understand the various aspects of Architectural Conservation. The study will be illustrated with maps, visuals, photographs and sketches.

GUIDELINES FOR PAPER SETTER

- One compulsory question of short answer type containing 5 questions of 2 marks each (10 Marks) is to be set from the entire syllabus.
- In addition, the examiner is to set Seven questions with minimum Two from each unit. Student would be required to attempt Five questions with minimum One from each unit including compulsory question

- Questions paper is to be set covering whole of the syllabus by making parts and mixing the topics.

REFERENCE BOOKS :

- Oliver Paul, "Encyclopaedia of Vernacular Architecture of world"
- Thakkar Jay, "Matra: Ways of measuring Built form of Himachal Pradesh", CEPT University.

B. ARCHITECTURE - VIII SEM.
SUSTAINABLE ARCHITECTURE-I
(Elective V)

Course Code	Course Name	L, ST/T, P	Credits - 3		Duration of Exam
BARCH-808-21	Sustainable Architecture-I	2 L, 1T	Int 40	Ext 60	03 hours

Course Objectives: To educate and make students aware about sustainability issues, need and importance of promoting sustainable Architecture.

CONTENTS

UNIT-I

- **Sustainable Development-** Introduction, definitions, objectives and scope
- **Man and Environment**- Introduction, issues and options
- **Human Settlements**- Planning, Growth, Development, Problems
- **Global warming –** Introduction, Causes, Effects and Remedies, Carbon Credits**.**
- Architect-**Role in Sustainable Development.**
- Energy - **Role, Importance in buildings**
- Sources of Energy- **Non- renewable and renewable – Role and Importance**
- **Sustainable Materials –** Production and use
- **Quality of indoor/outdoor environment**

UNIT-II

- **Sustainable Design –** Concept, Objectives, Principles, Approach to Sustainable design
- **Built Environment**- Sustainable Construction, Ecological Buildings, Green Building
- **Building Rating System**
- **ECBC Code**
- **Sustainability Assessment** - LEED, Life Cycle Assessment, GRIHA
- **Climate responsive and Solar Passive Strategies in Indian Climates**
- **Recycling/Reuse**
- **India's approach to sustainable Development**

TEACHING METHODOLOGY

- Emphasis shall be laid on understanding of Sustainable Development.
- Teaching in the subject will be a combination of Expert lectures, specific case studies and field visits to sustainable buildings/complexes.

GUIDELINES FOR PAPER SETTER

- One compulsory question of short answer type containing 5 questions of 2 marks each (10 Marks) is to be set from the entire syllabus .
- In addition, the examiner is to set Seven questions with minimum Three Questions from each unit. Student would be required to attempt Five questions with minimum Two from each unit including compulsory question

REFERENCE BOOKS:

- Koensberger, Ingersoll, Mayhew,Szokolay ,"Manual of Tropical Housing & Building, March 1974
- C.P. Kukreja,"Tropical Architecture,Tata McGraw-Hill Publishing Company, 1978.
- Martin Evans, "Housing, Climate & Comfort, Architectural Press, 1980.
- Lippsmeier, Georg, "Building in the Tropics, Callwey Verlag, Munchen, 1980
- Gideon S. Golany,"Design for Arid Regions, Publication Van Nostrand Reinhold, New York 1983.
- B.Givoni, "Man, Climate & Architecture, Von Nostrand Reinhold Company New York - 1981
- Reserch notes on climate:- C.B.R.I, Roorkee
- Krishan A,Baker, "Climate Responsive Architecture, McGraw-Hill Education (Asia) Co. and China Architecture & Building Press. 2004/2005
- Energy Efficient Buildings in India:- TERI

B. ARCHITECTURE - VIII SEM.
BUILDING MAINTENANCE - I
(Elective V)

Course Code	Course Name	L, ST/T, P	Credits - 3		Duration of Exam
BARCH-809-21	Building Maintenance - I	2 L, 1T	Int 40	Ext 60	03 hours

Course Objectives: To make student understand the Role and importance of the building maintenance in built environment.

CONTENTS

UNIT-I

- Maintenance- Introduction, Need, Scope, Importance& Role of an Architect.
- Maintenance-Economic and Social significance
- Maintenance - Problems and issues related to materials, design and detailing.
- Climate- Effect on the life cycle of buildings.
- Deterioration and Decay of buildings- Typology, Reasons, Prevention
- Deterioration and Decay- Causes, Effect, Remedies

UNIT-II

- Defects in Buildings-Efflorescence, Dampness, Settlement, Cracks, Corrosion etc - causes, effects, preventive and remedy
- Retrofitting of Buildings for Structural safety
- Building service and maintenance -- water supply, sewerage, and Sanitation system.
- Case study of any existing building

TEACHING METHODOLOGY

- Teaching in the subject will be a combination of Expert lectures, Specific case studies and field visits to buildings in deteriorating conditions.
- Lectures from representatives of industry and visits to the industrial units involved in producing materials to make buildings safe will be made integral part of teaching

GUIDELINES FOR PAPER SETTER

- One compulsory question of short answer type containing 5 questions of 2 marks each (10 Marks) is to be set from the entire syllabus.
- In addition, the examiner is to set Seven questions with minimum Three from each unit. Student would be required to attempt Five questions with minimum One from each unit including compulsory question
- Questions paper is to be set covering whole of the syllabus by making parts and mixing the topics.