FACULTY OF PHYSICAL PLANNING & ARCHITECTURE

SYLLABUS

FOR

Bachelor of Architecture (B.Arch.)
(SEMESTER: I - X)
(Credit Based Evaluation and Grading System)

Examinations: 2019-20

GURU NANAK DEV UNIVERSITY AMRITSAR

Bachelor of Architecture (B.Arch.) (Semester System)
(Credit Based Evaluation and Grading System)

Semester I (Autumn Semester)								
Sr. No	**Course Code**	**Course Title**	**Course Type**	**Credits**	**L**	**T**	**U**	**Duration of Exam.**
1.	ARL–101	Theory of Structures – I	DC	03	2	1	0	3hrs
2.	ARL–102	Building Science - I (Geology, Soils & Natural Calamities)	DC	03	2	1	0	3hrs
3.	ARU–103	Arts & Graphics-I	DC	03	1	0	2	4hrs
4.	ARU–104	Architectural Drawing–I	DC	05	1	0	4	4hrs
5.	ARU–105	Building Construction-I	DC	05	1	0	4	4hrs
6.	ARU–106	Architectural Design-I	DC	05	1	0	4	6hrs
7.	ENL – 101	Communicative English-I	IC	02	2	0	0	3hrs
8.	PBL-121/ PBL-122/ HSL 101	Punjabi Compulsory/ *ਮੁੱਢਲੀ ਪੰਜਾਬੀ/ * Punjab History & Culture **(1450-1716)**	IC	02	2	0	0	3hrs
9.	SOA 101	**Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)		-	3	0	0	3hrs
GRAND TOTAL:				**28**	**12**	**02**	**14**	**–**

Note:

1. *** Special Paper in lieu of Punjabi Compulsory, For those students who are not domicile of Punjab**
2. **** Student can opt this Paper whether in 1st or 2nd Semester.** (Compulsory ID Course)

Bachelor of Architecture (B.Arch.) (Semester System)
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Semester-II (Spring Semester)								
Sr. No	**Course Code**	**Course Title**	**Course Type**	**Credits**	**L**	**T**	**U**	**Duration of Exam.**
1.	ARL–152	Building Science –II (Building Materials)	DC	03	2	1	0	3hrs
2.	ARL–153	History of Architecture-I	DC	03	2	1	0	3hrs
3.	ARU–154	Arts & Graphics–II	DC	03	1	0	2	4hrs
4.	ARU–155	Workshop (Carpentry, Welding & Model Making)	DC	03	1	0	2	Viva Voce
5.	ARU–156	Building Construction-II	DC	05	1	0	4	4hrs
6.	ARU–157	Architectural Design-II	DC	05	1	0	4	6hrs
7.	ENL–151	Communicative English	IC	02	2	0	0	3hrs
8.	PBL–131/ PBL–132 HSL-102	Punjabi Compulsory **OR** ਮੁੱਢਲੀ ਪੰਜਾਬੀ * Punjab History & Culture **(1717-1947)**	IC	02	2	0	0	3hrs
9.	*SOA 101	*Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)		-	3	0	0	3hrs
			GRAND TOTAL:	**26**	**12**	**02**	**12**	
10.	-	Inter – Disciplinary Course	ID	-	-	-	-	-

NOTE:

1. *Special Paper in lieu of Punjabi compulsory

2. **For those students who are not domicile of Punjab

3.* Student can opt this Paper whether in 1st or 2nd Semester. (Compulsory ID Course)**

4. PSL-053 ID Course Human Rights & Constitutional Duties (Compulsory ID Couese). Students can opt. this paper in any Semester except 1st Semester. This ID Course is one of the total ID Papers of this course.

Bachelor of Architecture (B.Arch.) (Semester System)
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Semester-III (Autumn Semester)								
Sr. No.	**Subject Code**	**Course Title**	**Course Type**	**Credits**	**L**	**T**	**U**	**Duration of Exam**
1.	ARL–201	Building Science –III (Climatology)	DC	03	2	1	0	3hrs
2.	ARL–202	Theory of Design–I	DC	03	2	1	0	3hrs
3.	ARU–203	Architectural Drawing–II	DC	05	1	0	4	4hrs
4.	ARU–204	Building Construction-III	DC	05	1	0	4	4hrs
5.	ARU–205	Architectural Design-III	DC	08	2	0	6	12hrs
6.	ESL–220	Environmental Studies (Compulsory)	PIC	4	3	0	0	3hrs
			GRAND TOTAL:	**24**	**11**	**2**	**14**	**-**
7.		Inter – Disciplinary Course	ID	-	-	-	-	-

Bachelor of Architecture (B.Arch.) (Semester System)
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Semester-IV (Spring Semester)								
Sr. No.	**Course Code**	**Course Title**	**Course Type**	**Credits**	**L**	**T**	**U**	**Duration of Exam.**
1.	ARL–251	Theory of Structures – II	DC	03	2	1	0	3hrs
2.	ARL–252	Building Science – IV (Lighting and Acoustics)	DC	03	2	1	0	3hrs
3.	ARL–253	History of Architecture-II	DC	03	2	1	0	3hrs
4.	ARU–256	Building Construction-IV	DC	05	1	0	04	4hrs
5.	ARU–257	Architectural Design-IV	DC	08	2	0	06	12hrs
6.	ARF–259	Project Oriented Study Tour	DC	01	0	0	01	Viva Voce
7.	ARL-260	Computer Graphics	DC	03	2	1	0	Viva Voce
		GRAND TOTAL:		**26**	**11**	**04**	**11**	
8.		Inter – Disciplinary Course	ID	-	-	-	-	-

Bachelor of Architecture (B.Arch.) (Semester System)
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Semester V (Autumn Semester)								
Sr.No.	**Course Code**	**Course Title**	**Course Type**	**Credits**	**L**	**T**	**U**	**Duration of Exam.**
1.	ARL–302	Building Services – I	DC	03	02	01	0	3hrs
2.	ARU–304	Building Construction–V	DC	05	01	0	04	4hrs
3.	ARU–305	Architectural Design–V	DC	08	02	0	06	Viva Voce
4.	ARL–306	Theory of Structures – III	DC	03	02	01	0	3hrs
5.	ARL–308	Building specifications, Estimating & Costing	DC	03	02	01	0	3hrs
6.	ARL-309	History of Architecture-III	DC	03	02	01	0	3hrs
			GRAND TOTAL:	**25**	**11**	**04**	**10**	
7.		Inter – Disciplinary Course	ID	-	-	-	-	-

Bachelor of Architecture (B.Arch.) (Semester System)
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Semester VI (Spring Semester)								
Sr. No.	**Course Code**	**Course Title**	**Course Type**	**Credits**	**L**	**T**	**U**	**Duration of Exam.**
1.	ARL–351	Building Services II	DC	03	02	01	0	3hrs
2.	ARU–354	Building Construction –VI	DC	05	01	00	04	4hrs
3.	ARU–355	Architectural Design–VI	DC	08	02	0	06	Viva Voce
4.	ARF–356	Project Oriented Study Tour	DC	01	00	0	01	Viva Voce
5.	ARL–358	Surveying and Leveling	DC	03	02	01	0	3hrs
6.	ARL–362	Theory of Design-II	DC	03	02	01	0	3hrs
Elective subjects(any ONE of the following)								
7.	ARL-359	Maintenance and Adaptation of Buildings	DE	03	02	01	0	3hrs
8.	ARL-360	Advanced Construction Materials and Techniques	DE	03	02	01	0	3hrs
9.	ARL-361	Architectural Journalism	DE	03	02	01	0	3hrs
		GRAND TOTAL:		**26**	**11**	**04**	**11**	
8.		Inter – Disciplinary Course	ID	-	-	-	-	-

Semester VII (Autumn Semester)							
Sr. No.	**Course Code**	**Course Title**	**Credits**	**L**	**T**	**U**	**Duration of Exam.**
1	ARE–401	Practical Training	20	0	0	0	Viva Voce
		GRAND TOTAL:	20	0	0	0	
Note: The total duration of practical training will be of 24 weeks							

Semester VIII (Spring Semester)								
Sr. No.	**Course Code**	**Course Title**	**Course Type**	**Credits**	**L**	**T**	**U**	**Duration of Exam.**
1	ARL–451	Housing	DC	03	02	01	0	3hrs
2	ARL-452	Urban Design & Conservation	DC	03	02	01	0	3hrs
3	ARU-454	Building Construction-VII	DC	05	01	00	04	4hrs
4	ARU-455	Architectural Design-VII	DC	08	02	00	06	Viva voce
5	ARL–459	Landscape Architecture	DC	03	02	01	0	3hrs
Elective subjects(any ONE of the following)								
6	ARL-453	Vernacular Architecture	DE	03	02	01	0	3hrs
7	ARL-457	Hospital Architecture	DE	03	02	01	0	3hrs
8	ARL-458	Disaster Management	DE	03	02	01	0	3hrs
			GRAND TOTAL:	**25**	**11**	**04**	**10**	
9		Inter – Disciplinary Course	ID	-	-	-	-	-

Semester IX (Autumn Semester)								
Sr.	**Course Code**	**Course Title**	**Course Type**	**Cred-its**	**L**	**T**	**U**	**Duration of Ex-**
1.	ARL-501	Town Planning	DC	03	02	01	0	3 hrs
2.	ARL-502	Construction Management	DC	03	02	01	0	3 hrs
3.	ARU-505	Building Construction-VIII	DC	05	01	00	04	4 hrs
4.	ARU-506	Architectural Design-VIII	DC	08	02	00	06	Viva Voce
5.	ARL-507	Professional Practice & Building Bye Laws	DC	03	02	01	0	3 hrs
Elective subjects(any ONE of the following)								
6.	ARL-503	Green Buildings	DE	03	02	01	0	3 hrs
7.	ARL-508	Sikh Architecture	DE	03	02	01	0	3 hrs
8.	ARL-509	Socio - Economic Aspects of Architecture and Planning	DE	03	02	01	0	3 hrs
GRAND				**25**	**11**	**04**	**10**	
9.		Inter–Disciplinary Course	ID	-	-	-	-	-

Semester X (Spring Semester)								
Sr. No.	**Course Code**	**Course Title**	**Course**	**Credits**	**L**	**T**	**U**	**Dura-tion of**
1.	ARD-554	Architectural Thesis Project	DC	20	0	0	20	Viva - -
ELECTIVES (ANY ONE OF THE FOLLOWING THREE THEORY SUBJECTS)								
2.	ARL-551	Architectural Conservation	DE	03	02	01	0	3 hrs
3.	ARL-552	Interior Design	DE	03	02	01	0	3 hrs
4.	ARL-553	Multistoried Buildings	DE	03	02	01	0	3 hrs
GRAND				**23**	02	01	20	

Bachelor of Architecture (B.Arch.) (Semester-I)
(Credit Based Evaluation and Grading System)

Subject Code: ARL–101 **Duration of Examination 3 Hrs**
Course Title: Theory of Structures –I **Credits: 03 (L=2, T=1, U=0)**

Minor Test:20%
Assigment/Seminar/Case Study/Minor Project:20%
Quiz/Group Discussion:10%
End Semester Examination: 50%

Course Contents:

SECTION - A

Centre of gravity (CG), definition, Centre of gravity of plane figures, CG by method of moments, numerical problems, Moment of Inertia; MI of plane area, MI by method of integration, MI of rectangular section, theorem of parallel axis (M1) and perpendicular axis and numerical problems.

SECTION - B

Bending moment (BM), shear force (SF), type of supports, loads and beams, relation between SF and BM, BM and SF diagram for cantilever and simply supported beams with concentrated load, uniformly distributed load, design examples.

SECTION - C

Moment of resistance, theory of bending, bending stresses, basic equation of bending, section-modulus of rectangular sections. Numerical problems.
Resultant of concurrent forces, non-concurrent forces, co-planar parallel force system and numerical problems.

SECTION – D

Concept and development of vector-active structure system, examples, merits and demerits. Introduction to various components of truss.
Types of trusses. Classification of frames, analysis of perfect frame, assumptions, method of sections, method of joints and design examples

Suggested Readings:

1. P.C. Punmia, Strength of Materials and Theory of Structures; Vol I, Laxmi Publications, Delhi, 1994.
2. S.Ramamurtham, Strength of Materials – Dhanpatrai & Sons, Delhi, 2015.
3. W.A.Nash,Strength of Materials – Schaums Series – McGraw Hill Book Company,1989.
4. R.K.Bansal – Engineering Mechanics and Strength of Materials – Lakshmi Publications, Delhi,1990.
5. R.K.Rajput – Strength of Materials, S .Chand & Company Ltd., New Delhi 1996
6. Schodek, Daniel. “Structures”, Prentice Hall of India, New Delhi, 2004.
7. Engel, Heino; “Structures System”, Hatje Cantz Verlag, 2007.

Bachelor of Architecture (B.Arch.) (Semester-I)
(Credit Based Evaluation and Grading System)

Course Code : ARL–102 **Duration of Examination: 3 Hrs**
Course Title: Building Sciences –I
(Geology, Soils & Natural Calamities) **Credits : 03 (L=2,T=1,U=0)**
Minor Test:20%
Assigment/Seminar/Case Study/Minor Project:20%
Quiz/Group Discussion:10%
End Semester Examination: 50%

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Contents:

SECTION - A

Introduction to building Science, Relevance of building science in Architecture, General Geology of Earth's Crust, Modes of Rock formation. Action of River, Glacier's sea, Wind, and the underground water.
Factors governing selection of Building Stones, geological criteria governing selection of sites.

SECTION - B

Terminology and basic knowledge of natural calamities–Earthquakes, Tsunami, Landslides, Floods, Volcanoes, Cyclones, Hurricanes etc.- causes, impact, magnitude, destruction level

SECTION - C

Type and characteristics of soils, classification of soils: as per particle size, texture particle size, Texture; Highway Research Board, Unified Soil Geological and I.S. classification system.
Introduction to soil mechanics, soil as three phase system, water content, UNIT weight, specific gravity, void ratio content and functional relationship.

SECTION - D

Bearing Capacity of Soil–basic definitions, factors affecting bearing capacity of soils. Determination of bearing capacity by plate load test, cone penetration test, Methods to improve Bearing Capacity of Soils.
Earth Pressure: Introduction to Active Earth Pressure & Earth Pressure at rest.

Suggested Readings:

1. Singh, Parbin, "Engineering and Geology" ,S.K. Kataria & Sons, New Delhi, 2010.
2. Simha, Bharata. Parkash, Shamsher; "Soil Mechanics and Foundation Engineering", Nem Chand & Bros., 1990.
3. Mukherjee, Pratip Kumar; "A Textbook of Geology", World Press Pvt. Ltd.,Kolkata. 1969
4. Mears, Brainerd ,"The Changing Earth- An introductory Geology ", Van Nostrand Reinhold Company.1970
5. Harbeck ,Richard M; Johnson, Lloyd K; " Earth & Space Science", Holt, Rinehart & Winston, Inc., New York.1965

Course Code : ARU–103 **Duration of Examination : 4 Hrs**

Course Title: Arts & Graphics –I **Credits : 03 (L=1,T=0,U=2)**

Internal Assessment: 50%

End Semester Examination: 50

Course Contents:

- Different strokes used in pencil (2B, 4B, 6B, 8B), Charcoal pencil showing texture of various materials like brick, stone, grass, timber; shadows in water.
- Free hand still life sketching, in pencil, of various solids like cones, cubes, cylinders and spheres along with light and shade.
- Free hand drawing of objects of daily use like lamp, jug, bottle, cup, book etc.
- Free hand sketching, in pencil, of trees, shrubs, human figures, lamp posts, rocks etc.

Suggested Readings:

1. Williams, Guy R., "Drawing and Sketching" Museum Press,1963
2. Gill, Robert W., "Basic Rendering", Thames & Hudson Australia Pty Limited, 1991
3. Goldman, Ken, "Charcoal Drawing", Water Foster Publishing Incorporated, 2011
4. Gill, Robert W., "Rendering With Pen & Ink" Thames & Hudson Australia Pty Limited, 1990
5. Pitz, Henry C, "Charcoal Drawing" Watson-Guptill Publications, Incorporated, 1950

INSTRUCTIONS FOR THE EXAMINER /PAPER SETTER

- Three questions to be attempted by the candidates.
- Reasonable choice should be given.

Course Code : ARU–104
Course Title: Architectural Drawing–I

Duration of Examination : 4 Hrs
Credits : 05 (L=1,T=0,U=4)
Internal Assesment: 50%
End Semester Examination: 50%

Course Contents:

- Various types and grades of lines used in Architectural Drawing.
- Free hand lettering.
- Use of different scales (plain & diagonal) in Architecture.
- Drawing of plan, elevation and section of simple objects.
- Orthographic Projections in first angle of lines, planes & solids in various positions (Inclined to one plane only)
- Section through solids (Section Plane Inclined to one plane only)
- Isometric, projections of solid compositions.

Suggested Readings:

1. Bhatt, N.D. and Panchal, U.M. (2004). "Engineering Drawing – Plane and Solid Geometry", Charotar Publishing House, Bombay, India reprint 44th Edition 2002.
2. Dhawan, R.K. (2005). "A Textbook of Engineering Drawing", S. Chand Publishers, New Delhi, India

INSTRUCTIONS FOR THE EXAMINER/ PAPER SETTERS

- Total of three or four questions to be attempted by the candidates depending upon the length of the paper.
- Reasonable choice should be given

Bachelor of Architecture (B.Arch.) (Semester-I)
(Credit Based Evaluation and Grading System)

Course Code : ARU–105
Course Title: Building Construction–I

Duration of Examination : 4 Hrs
Credits : 05 (L=1,T=0,U=4)

Internal Assessment: 50%
End Semester Examination: 50%

Course Contents:

Section -A

- Introduction to tools used in masonry.
- Types of Bricks.
- Various types of brick bonds and wall junctions up to 13 1/2" wall thickness.
  Brick Bonds:
  a. English Bond
  b. Flemish Bond (Single and Double)
  c. Rat Trap Bond
- Wall Junctions (English & Flemish bonds).
  a. L Junction
  b. Tee
  c. Cross, and
  d. Oblique
  e. (Laying of brick bonds/ junctions on sites)

Section -B

- Dressing, laying and bonding in Stone Masonry.
  a. Random Rubble
  b. Coursed Rubble
  c. Ashlar
- Finishing of Exposed Brick and Stone surfaces, Pointing and its types

Section -C

- Components of arches and types of Arches. Arches in bricks and stones
  a. Flat
  b. Segmental
  c. Semicircular
  d. Multi- foliated
- Construction of brick jallis and boundary walls.

Suggested Readings:

1. Watson, Don A., "Construction Materials and Processes", McGraw Hill Co., University of Michigan, 1972.
2. Mckay, W.B., "Building Construction", Vol.1, 2, 3, Longmans, U.K. 1981.
3. Alanwerth, "Materials", The Mitchell Pub. Co. Ltd., London, 1986.
4. Chudley, R., "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990.
5. Barry, R., "Building Construction", East West Press, New Delhi, 1999.

Guidelines for Teachers:

The emphasis shall be laid on sequence and procedure/ methodology of construction.
The extensive site visits shall be conducted for better understanding of the subject.

INSTRUCTIONS FOR THE EXAMINER / PAPER SETTER

- **Total three or four questions to be attempted by the candidates depending upon the length of the paper.**
- **Atleast one question to be set from each section.**
- **Reasonable choice should be given.**

Bachelor of Architecture (B.Arch.) (Semester-I)
(Credit Based Evaluation and Grading System)

Course Code: ARU–106 **Duration of Examination: 6 Hrs.**

Course Title: Architectural Design–I **Credits: 05 (L=1, T=0, U=4)**

Internal Assesment: 50%

End Semester Examination: 50%

Intent:

To make the students learn the application of elements and principles of Basic Design with orientation to Architectural Design.

Course Contents:

Introduction to the profession of architecture, role of architects in the society, familiarity with famous Indian/foreign architects and their projects;

Section-A

Basic Design:

-Importance of Elements and Principles of Design (Balance, Rhythm, Contrast, Harmony, Emphasis, Line, Colour, Texture, Scale etc.); their types and application.

-Two dimensional compositions using different colours, textures and grades with Lines.

-Two dimensional compositions using geometrical shapes like rectangle, circle, square etc. in coloured paper/sheet/cardboard etc.

-Three dimensional compositions using geometrical forms like cube, cuboid, cylinder, pyramid, sphere etc.

-Design of a Logo/ Sign board/ Magazine cover/ Carpet etc.

Section-B

Anthropometric Dimensions:

-Study of human dimensions in various postures; human activity and the use of space, circulation, furniture (size, shape and design), clearance, height etc.

Suggested Readings:

1. Chiara, Joseph De "Time Saver Standards for Building types" McGraw–Hill Professional Publishing, New York, 2001.
2. Smithies, K.W. "Principles of Design in Architecture" Chapman & Hall, 1983.
3. Ching, Francis D.K. "Architectural Form, Space and Order", Van Nostrand Reinhold International Thomson Publishing, Inc.: New York, 1996.
4. Rompilla, Ethel, "Color for Interior Design", Harry N. Abrams, New York, First Edition, 2005.

INSTRUCTIONS FOR THE EXAMINER / PAPER SETTER

- Any special materials/ sheets –handmade / cartridges / tracing/ coloured paper, glue etc. to be supplied to the candidates should be listed on the envelope containing the question paper
- Topic of the problems should be written on top of the envelope containing the question paper, as it is to be displayed on the notice board ten days before the examination.
- Two questions are to be set one from each section.

ENL-101: COMMUNICATIVE ENGLISH

Credits: 02 (L= 2, T=0, U=0)
Total Marks-100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Objective: To introduce students to the skills and strategies of reading and writing by identifying organizational patterns, spotting classification systems and understanding associations between ideas. This course will prepare students to read a variety of texts and also to communicate more effectively through writing. The course will also pay special attention to vocabulary building.

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Prescribed Text Books:

- *The Written Word* by Vandana R. Singh, Oxford University Press, New Delhi.
- *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

Section–A

"Word List", "Correct Usage of Commonly used words and Phrases" from the chapter "Vocabulary" given in ***The Written Word*** by Vandana R. Singh.

Section–B

Letter- writing as prescribed in ***The Written Word*** by Vandana R. Singh.
Report writing as prescribed in ***The Written Word*** by Vandana R. Singh.

Section–C

Section 1 from ***Making Connections: A Strategic Approach to Academic Reading*** by Kenneth J. Pakenham, Second Edition.

Section–D

Section 2 from ***Making Connections: A Strategic Approach to Academic Reading*** by Kenneth J. Pakenham, Second Edition.

PBL 121: ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ - I

Credit: 2-0-0
Total Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਸੈਕਸ਼ਨ-ਏ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਭਾਈ ਵੀਰ ਸਿੰਘ
(ਅ) ਧਨੀ ਰਾਮ ਚਾਤ੍ਰਿਕ
(ਇ) ਪ੍ਰੋ. ਪੂਰਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)

II. ਗੁਰਮੁਖੀ ਔਰਥੋਗਰਾਫੀ ਦੀ ਜੁਗਤ (ਪੈਂਤੀ, ਮੁਹਾਰਨੀ, ਬਿੰਦੀ, ਟਿੱਪੀ ਤੇ ਅੱਧਕ); ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹ, ਸ਼ਬਦ ਜੋੜ (ਸ਼ੁਧ-ਅਸ਼ੁਧ)

ਸੈਕਸ਼ਨ-ਬੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਫਿਰੋਜ਼ਦੀਨ ਸ਼ਰਫ
(ਅ) ਪ੍ਰੋ. ਮੋਹਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)

II. ਲੇਖ ਰਚਨਾ (ਜੀਵਨੀ-ਪਰਕ, ਸਮਾਜਕ ਅਤੇ ਚਲੰਤ ਵਿਸ਼ਿਆਂ ਉੱਤੇ) : 10 ਲੇਖ ਲਿਖਵਾਉਣੇ
(ਕਲਾਸ ਵਿਚ ਅਤੇ ਘਰ ਲਈ ਅਭਿਆਸ)

ਸੈਕਸ਼ਨ-ਸੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਨੰਦ ਲਾਲ ਨੂਰਪੁਰੀ
(ਅ) ਅਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ
(ਇ) ਡਾ. ਹਰਿਭਜਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)

II. ਸ਼ੁੱਧ, ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ
(15 ਪੈਰ੍ਹਿਆਂ ਦੇ ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ ਅਭਿਆਸ ਕਰਵਾਉਣੇ)

ਸੈਕਸ਼ਨ-ਡੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ
(ਅ) ਸੁਰਜੀਤ ਪਾਤਰ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)

II. ਅਖ਼ਬਾਰੀ ਇਸ਼ਤਿਹਾਰ : ਨਿੱਜੀ, ਦਫ਼ਤਰੀ ਤੇ ਸਮਾਜਕ ਗਤੀਵਿਧੀਆਂ ਨਾਲ ਸੰਬੰਧਤ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

PBL-122: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

Credits: 2-0-0
Total Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਪਾਠ-ਕ੍ਰਮ

ਸੈਕਸ਼ਨ-ਏ

ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ,
ਮਾਤ੍ਰਾਵਾਂ (ਮੁਢਲੀ ਜਾਣ-ਪਛਾਣ)
ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਤੇ ਵਰਤੋਂ

ਸੈਕਸ਼ਨ-ਬੀ

ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ
ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ
ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ

ਸੈਕਸ਼ਨ-ਸੀ

ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ।
ਸਮਾਨਾਰਥਕ ਤੇ ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ

ਸੈਕਸ਼ਨ-ਡੀ

ਹਫਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਮ, ਇਕ ਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿੱਚ।

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

HSL–101: Punjab History & Culture (1450-1716)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Credits: 2-0-0
Total Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

1. Land and the People.
2. Bhakti Movement

Section-B

3. Life and Teaching of Guru Nanak Dev.
4. Contribution of Guru Angad Dev, Guru Arjun Dev, Guru Amar Das and Guru Ram Das.

Section-C

5. Guru Hargobind.
6. Martyrdom of Guru Teg Bahadur

Section-D

7. Guru Gobind Singh and the Khalsa.
8. Banda Singh Bahadur: Conquests and Execution.

Suggested Reading:

1. Kirpal Singh (Ed.), *History and Culture of the Punjab, Part-ii, Punjabi University*, Patiala, 1990.
2. Fauja Singh (Ed.), *History of Punjab, Vol, III Punjabi University, Patiala, 1987.*
3. J.S. Grewal, *The Sikhs of the Punjab, Cup, Cambridge, 1991.*
4. Khushwant Singh, *A History of the Sikhs,* Vol. I, OUP, New Delhi, 1990.

DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(Student can opt this Paper in 1st or 2nd Semester)

SOA: 101–PROBLEM OF DRUG ABUSE

Time: 3 Hours **Credit 3-0-0**
Total Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section – A

Meaning of Drug Abuse:

1) Meaning, Nature and Extent of Drug Abuse in India and Punjab.

2) Consequences of Drug Abuse for:

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

Section – B

Management of Drug Abuse:

(i) Medical Management: Medication for treatment and to reduce withdrawal effects.
(ii) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
(iii) Social Management: Family, Group therapy and Environmental Intervention.

Section – C

Prevention of Drug Abuse:

(i) Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
(ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

Section – D

Controlling Drug Abuse:

(i) Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
(ii) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

References:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection.* Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcohalism. Harmond Worth:* Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society.* New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism,* Smoking obscenity New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,* Cambridge University Press.
13. Verma, P.S. 2017, "*Punjab's Drug Problem: Contours and Characterstics",* Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

Course Code : ARL–152 **Duration of Examination : 3 Hrs**
Course Title: Building Science–II (Building Materials) **Credits : 03 (L=2,T=1,U=0)**
Course Contents:

Minor Test:20%
Assigment/Seminar/Case Study/Minor Project:20%
Quiz/Group Discussion:10%
End Semester Examination: 50%

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION - A

Elementary elements of a building; their functions and characteristics
Brick: Classification; Uses; Composition of brick earth; Useful and harmful ingredients; Properties of good brick earth; Strength of bricks; Sizes and weight of bricks; Tests; Special forms; Manufacturing process of brick in brief.
Stone: Sources; Choice and uses of stone; Characteristics of good stone; Tests for stones; Preservation; Destroying agents; Stone quarrying, dressing and polishing; Artificial Stone.

SECTION - B

Lime: Sources; Uses; Classification; Characteristics of good lime; testing lime stone; storing; manufacture in brief.
Cement: Characteristics and properties; Composition; Harmful ingredients; Tests; Field Examination; Uses; Storage; Varieties; Manufacturing process in brief.

SECTION - C

Concrete: Properties; Uses; Material based Classification; Proportion of ingredients; Mixing and laying of lime concrete and cement concrete; Consolidating concrete; Construction Joints in concrete; Finishing concrete; curing of concrete; Special type of Concrete; Water Cement ratio; Consistency of concrete
Timber: Structure of timber tree, Felling of trees, Characteristics of timber, Defects, diseases, Decay, Seasoning, Preservation, Conversion; Market forms Industrial forms; Various uses of timber.

SECTION - D

Paints: Uses; Classification; Constituents; Characteristics; application on different surfaces; destroying agents; various paints.
Varnishes: Uses, Ingredients; Types; Characteristics of good varnish, Polishing, process of varnishing.

Suggested Readings:

1. Rangwala, S.C., “Engineering Materials”, Charotar Publishing House, Gujarat, 1997.
2. Punmia, B.C., “Building Construction”, Laxmi Publications Pvt. Ltd., New Delhi,
3. Lyons, Arthur, “Materials for Architects and Builders – An introduction”, Arnold, London, 1997.
4. Watson, Don A, “Construction Materials and Process”, McGraw Hill Co., University of Michigan, New Jersey, 1972.
5. Launders, Jack M., “Construction Materials and Methods Careers”, South Holland, Illinois Wilcox Co. Ltd., 1986.
6. Mckay, W.B.; “Building Construction”, Longmans, UK, 1981.
7. Ching, Francis D.K., “Building Construction”, Illustrated VNR.1975

Bachelor of Architecture (B.Arch.) (Semester-II)
(Credit Based Evaluation and Grading System)

Course Code: ARL 153 **Duration of Examination: 03 Hrs**

Course Title: History of Architecture-I **Credits: 03 (L=02, T=1, U=0)**

Minor Test:20%
Assigment/Seminar/Case Study/Minor Project:20%
Quiz/Group Discussion:10%

End Semester Examination: 50%

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Contents

SECTION - A

A brief reference to the shelters of prehistoric times; River valley civilizations: Development of Architecture in Indus Valley, Nile Valley and plains of Tigris & Euphrates; Development of Architecture in Greek Civilization: Greek Orders, Temples, Optical Corrections, Theatres, Agora, Acropolis, etc.

SECTION - B

Development of Architecture during Roman period: Roman Orders, Temples, forums, basilicas, thermae, amphitheatres, etc. An overview of developments during the Vedic period; Development of Buddhist Architecture: Ashokan pillars/ stambhas, Development of stupas; Development of rock cut architecture through the Hinayana & the Mahayana phase (chaityas & viharas).

SECTION - C

Genesis of Hindu Architecture during the Gupta & the Chalukyan period; Development of Dravidian Architecture through different phases: Pallavas, Cholas, Pandyas, Vijainagar & Madura

SECTION - D

Indo–Aryan Architecture: Orissa, Khajuraho & Gujarat; Jain Architecture

Suggested Readings:

- Cruickshank, Dan; Sir Banister Fletcher's "A History of Architecture", CBS Publishers & Distributors, Delhi, 1999.
- Fletcher, B., 'History of Architecture', CBS Publishers & Distributors, Delhi, 1999.
- Brown, P., 'Indian Architecture (Buddhist and Hindu Periods)', DB Taraporevala Sons & Co. Private Ltd., Bombay, 1971.
- Grover, S., 'Buddhist and Hindu Architecture in India', CBS Publishers & Distributors, Delhi,2003.
- Tadgel, C., 'The History of Architecture in India', Architecture Design & Technology Press, London, 1990.
- Acharya, P.K., 'Hindu Architecture in India and Abroad', Oriental, New Delhi, 1979.

Course Code : ARU–154 **Duration of Examination : 4 Hrs**
Course Title: Arts & Graphics–II **Credits : 03 (L=1,T=0,U=2)**
Internal Assessment: 50%
End Semester Examination: 50%

Course Contents:

- Preparation of Colour wheel in Poster Colours. Use and application of colour wheel (hue, tint & tones)
- Outdoor free hand sketching of trees, shrubs, simple buildings, human figures, automobiles etc. in color (Water Colors, Pencil Colours, Poster Colours & Oil pastels).
- Rendering of various scenes (small structures) such as Milk bar (in Rose garden or near lake) , Bus Stop, Cafeteria, Petrol filling station, street view with vehicles, people and other features etc. in Pen & Ink, Water Colour and mix media.

Suggested Readings:

1. Oliver, Robert S., "The Sketch in Color (Architecture)", Van Nostrand Reinhold, 1984.
2. Suffudy, "Sketching Techniques", Watson-Guptill, 1985.
3. Smith, Ray, "Water Color Landscape", DK Adult, 1993.
4. Kasprisin, Ronald J., "Water Color in Architecture", Van Nostrand Reinhold, 1989.
5. Chen, S.M., "Architecture in Pen & Ink", Mcgraw-Hill, 1994.
6. Williams, G. R., "Drawing and Sketching", Museum Press, 1963.
7. Gill, R.S., "Basic Rendering", Thames & Hudson Austrailia Pvt. Ltd, 1991.
8. Ken. Goldman, "Charcoal Drawing", Walter Foster Publishing, 1996.
9. Gill, R.W., "Rendering with Pen & Ink:, Thames & Hudson, July 1984.
10. Campanario G., "The Art of Urban Sketching" Quarry Books, Dec 2012.

INSTRUCTIONS FOR THE EXAMINER /PAPER SETTER

- Two questions are to be attempted by the candidates.
- Reasonable choice should be given.

Course Code : ARU–155 **Duration of Examination : Viva Voce**
Course Title: Workshop **Credits : 03 (L=1,T=0,U=2)**
(Carpentry, Welding & Model Making)

Internal Assessment: 50%
End Semester Examination: 50%

Course Contents:

Carpentry

Measuring, cutting and sawing of natural wood in workshop.

Different types of tools used for making joints namely; mortise & tenon joint, mitre joint, lap dove tail joint, T–lap joint, corner lap joint, cross lap joint, bridle joint, shoulder angle joint, through dovetail joint, rafter joint & notching joint.

Welding

Process, types of welding namely gas welding/ oxy–acetylene & arc welding, equipment used, different types of welds and their suitability.

Model Making

Introduction: Importance of architectural models in the profession, materials used in making different types of architectural models: their types and selection criteria. Techniques for fabrication of geometrical shapes like cube, cuboids, pyramids, prisms etc. Use of wood, cork sheet, mount board, ivory sheet, acrylic, x–ray sheet, tooth picks, threads, pins, etc. Preparation of Model Base: Components of site layout like parking, roads, pavements, landscaping, trees, slope/contours etc. by using materials like ply board, clay, Plaster of Paris, saw dust, foam, cork sheet, velvet sheet, sand paper, thermocol, etc. Preparation of Block Model: Building blocks by using materials like thermocol, wood, mount board, ivory sheet, foam etc. Preparation of Detailed Model: Building blocks with details like windows, doors, porch, balconies, pergola, terraces, parapet etc. Sectional model with details of inside, by using materials like wood, cork sheet, mount board, ivory sheet, acrylic, x–ray sheet, tooth picks, threads, pins, etc.

Suggested Readings:

1. Mills, Criss B., “Designing with Models”,John Wiley & Sons, New Jersey,.
2. Knoll, Wolfgang & Hechinger, Martin, “Architectural Models”, J.Ross Publishing,2006.
3. Watson, Don A., “Construction Materials and Processes”, McGraw Hill Co., University of Michigan,1972.
4. Mckay, W.B., “Building Construction”, Vol.1, 2, 3 Longmans, U.K.1981.
5. Alanwerth, “Materials”, The Mitchell Pub.Co.Ltd., London, 1986.
6. Chudley, R., “Building Construction Handbook”, British Library Cataloguing in Publication Data, London, 1990.
7. Rangwala, S.C., “Engineering Materials”, Charotar Pub.House, Gujarat, 1997.

Bachelor of Architecture (B.Arch.) (Semester-II)
(Credit Based Evaluation and Grading System)

Course Code : ARU–156 **Duration of Examination: 4 Hrs**
Course Title: Building Construction–II **Credits : 05 (L=1,T=0,U=4)**
Internal Assessment: 50%
End Semester Examination: 50%

Course Contents:

Section-A

- Simple joints used in joinery of Timber doors and windows.
- Introduction to hardware used in doors and windows.
- Various types of Wooden windows (Fixed, side and top hung, pivoted, louvered including Fixing and Hardware Detail):
  1. Casement with ventilators
  2. Wire mesh
  3. Clerestory
  4. Bay
- Various types of Wooden doors
  - Ledged, battened and braced.
  - Panel and Wire mesh
  - Flush
  - Glazed

Section-B

- Foundations of walls and columns in stone and brick masonry.
- Damp proof courses and materials
- Section through a Single Storey structure with all details showing, Foundations, Plinth band DPC, sills (sill band) and Details of lintel, Chhajja lintel band in concrete, brick and stone. RCC roof slab construction incorporating terrace, parapet and Rain water trough (Khurra) details, in masonry structures.

Suggested Readings:

1. Don A. Watson, "Construction Materials and Processes", McGraw Hill Co., University of Michigan 1972.
2. Mckay, W.B., "Building Construction", Vol.1, 2, 3 Longmans, U.K. 1981.
3. Alanwerth, "Materials", The Mitchell Pub. Co. Ltd., London, 1986.
4. Chudley, R., "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990.
5. Barry, R, "Building Construction", East west press, New Delhi, 1999.

Guidelines for Teachers:

The emphasis shall be laid on sequence and procedure/ methodology of construction.
The extensive site visits shall be conducted for better understanding of the subject.

INSTRUCTIONS FOR THE EXAMINER / PAPER SETTER

- **Total three or four questions to be attempted by the candidates depending upon the length of the paper.**
- **At least one question to be set from each section.**
- **Reasonable choice should be given.**

Bachelor of Architecture (B.Arch.) (Semester-II)
(Credit Based Evaluation and Grading System)

Course Code: ARU–157 **Duration of Examination: 6 Hrs.**

Course Title: Architectural Design–II **Credits: 05 (L=1, T=0, U=4)**

Internal Assessment: 50%

End Semester Examination: 50%

Intent:

To train the students in understanding Space, Form and Function in the process of Architectural Design.

Course Contents:

Architectural design process and product, design brief - its importance and interpretation, preparation of circulation/flow diagrams, design parameters- physical, socio-cultural, economic, climatic etc.

- Study and design of small spaces like drawing room, dining room, bed room, kitchen, toilets, study room, class room, offices etc. and making their measured drawings,
- Design of simple structure like Bus Shelter/ Milk Bar/ Small Ice Cream Parlour/ Gift Shop/ Florist Kiosk/ Enquiry etc
- Design of Snack Bar/ Petrol Pump/ Rural Dispensary/ Suvidha Kendra etc.

Summer Project:

During summer vacation the students shall measure all the spaces, take photographs, draw relevant sketches and make rough drawings (to scale) of their own house.

Final drafting (of the measured drawings of their own house) shall be carried out in the studio class of Architectural Design-III and shall be part of the internal assessment of Architectural Design-III, 3rd semester B. Arch.

Suggested Readings:

1. Smithies, K.W; "Principals of Design in Architecture", Chapman & Hall, London, 1983.
2. Ching, Francis D.K; "Architectural Form, Space and Order", Van Nostrand Reinhold International Thomson Publishing, Inc.: New York, 1996.
3. Rompilla, Ethel; "Color for Interior Design", Harry N. Abrams, New York, First Edition, 2005.
4. Chiara, Joseph De; "Time Saver Standards for Building types" McGraw–Hill Professional- Publishing, 2001.

INSTRUCTIONS FOR THE EXAMINER / PAPER SETTER

- Any special materials/ sheets –handmade / cartridges / tracing to be supplied to the candidates should be listed down on the envelope containing the question paper.
- Topic of the problem should be written on top of the envelope containing the question paper. This topic is to be displayed on the notice board ten days before the examination.

Bachelor of Architecture (B.Arch.) (Semester-II)
(Credit Based Evaluation and Grading System)

COMMUNICATIVE ENGLISH–II

Subject Code- ENL-151 **Credits: 02 (L= 2, T=0, U=0)**
Total marks-50

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Objective: To introduce students to the skills and strategies of reading and writing by identifying organizational patterns, spotting classification systems and understanding associations between ideas. This course will prepare students to read a variety of texts and also to communicate more effectively through writing. The course will also pay special attention to vocabulary building.

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Prescribed Text books:

- *The Written Word* by Vandana R. Singh, Oxford University Press, New Delhi.
- *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

SECTION–A

Practical question on Note Making, Summarizing and Abstracting as given in ***The Written Word*** by Vandana R. Singh

SECTION–B

Practical question on Paragraph writing as prescribed in ***The Written Word*** by Vandana R. Singh

SECTION–C

Theoretical questions based on ABC of Good Notes as prescribed in ***The Written Word*** by Vandana R. Singh.

Section C from ***Making Connections: A Strategic Approach to Academic Reading*** by Kenneth J. Pakenham, Second Edition.

SECTION–D

Practical question on Essay writing from ***The Written Word*** by Vandana R. Singh
Section 4 from ***Making Connections: A Strategic Approach to Academic Reading*** by Kenneth J. Pakenham, Second Edition.

PBL 131: ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ–II

Credit: 2-0-0
Total Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਸੈਕਸ਼ਨ-ਏ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੌਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਨਾਨਕ ਸਿੰਘ : **ਭੂਆ**
(ਅ) ਗੁਰਮੁਖ ਸਿੰਘ ਮੁਸਾਫਿਰ : **ਬਾਗੀ ਦੀ ਧੀ**
(ਇ) ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ : **ਪੇਮੀ ਦੇ ਨਿਆਣੇ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)

II. ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ/ਮੂਲ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਵਿਉਂਤਪਤ ਅਤੇ ਰੁਪਾਂਤਰੀ), ਸਮਾਸ।

ਸੈਕਸ਼ਨ-ਬੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੌਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਸੁਜਾਨ ਸਿੰਘ : **ਬਾਗਾਂ ਦਾ ਰਾਖਾ**
(ਅ) ਕਰਤਾਰ ਸਿੰਘ ਦੁੱਗਲ : **ਤੈਂ ਕੀ ਦਰਦ ਨਾ ਆਇਆ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)

II. ਪੈਰ੍ਹਾ ਰਚਨਾ : ਕਲਾਸ ਵਿਚ 10 ਵਿਸ਼ਿਆਂ (ਸਭਿਆਚਾਰ, ਧਾਰਮਕ ਅਤੇ ਰਾਜਨੀਤਕ) 'ਤੇ ਪੈਰ੍ਹਾ ਰਚਨਾ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ।

ਸੈਕਸ਼ਨ-ਸੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੌਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ : **ਧਰਤੀ ਹੇਠਲਾ ਬੋਲਦ**
(ਅ) ਨਵਤੇਜ ਸਿੰਘ : **ਦੂਜੀ ਵਾਰ ਜੇਬ ਕੱਟੀ ਗਈ**
(ਇ) ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ : **ਲੱਛਮੀ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)

II. ਮੁਹਾਵਰੇ ਤੇ ਅਖਾਣ (ਅਖਾਣ ਤੇ ਮੁਹਾਵਰਾ ਕੋਸ਼ ਵਿਚ) 200 ਮੁਹਾਵਰਿਆਂ ਅਤੇ 100 ਅਖਾਣਾਂ ਨੂੰ ਵਾਕਾਂ ਵਿਚ ਵਰਤਣ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ (ਕਲਾਸ ਵਿਚ ਤੇ ਘਰ ਲਈ)।

ਸੈਕਸ਼ਨ-ਡੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੌਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਅਜੀਤ ਕੌਰ : **ਬੁੱਤ ਸ਼ਿਕਨ**
(ਅ) ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ : **ਬੱਸ ਕੰਡਕਟਰ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)

II. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸੰਬੰਧਕ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

PBL-132: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

Credits: 2-0-0
Total Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਪਾਠ–ਕ੍ਰਮ

ਸੈਕਸ਼ਨ–ਏ

ਸਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ

(ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ)

ਸੈਕਸ਼ਨ–ਬੀ

ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇ-ਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਨਾਲ ਸਬੰਧਤ ।

ਸੈਕਸ਼ਨ–ਸੀ

ਪੰਜਾਬੀ ਵਾਕ-ਬਣਤਰ

ਸਾਧਾਰਨ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਸੰਯੁਕਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਮਿਸ਼ਰਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਸੈਕਸ਼ਨ–ਡੀ

ਪੈਰ੍ਹਾ ਰਚਨਾ

ਸੰਖੇਪ ਰਚਨਾ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ।ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

HSL–102: Punjab History & Culture (1717-1947)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Credits: 2-0-0
Total Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

1. Sikh Struggle for Sovereignty.
2. Ranjit Singh: Conquests, Administration and the Anglo-Sikh Relations.

Section-B

3. Anglo-Sikh Wars and the Annexation.
4. The Punjab under the British: New Administration, Education and social Change.

Section-C

5. Economic Changes: Agricultural
6. Socio-Religious Reform Movements.

Section-D

7. Role of Punjab in the Freedom Struggle.
8. Fairs and Festivals.

Suggested Readings:

1. Kirpal Singh (Ed.), *History and Culture of the Punjab*, Part-II, Punjabi University, Patiala, 1990.
2. Fauja Singh (Ed.), *History of Punjab*, Vol, III, Punjabi University, Patiala, 1987.
3. J.S. Grewal, *The Sikhs of the Punjab, Cup, Cambridge, 1991.*
4. Khushwant Singh, *A History of the Sikhs*, Vol. I, OUP, New Delhi, 1990.

Bachelor of Architecture (B.Arch.) (Semester-II)
(Credit Based Evaluation and Grading System)

DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(Student can opt this Paper in 1st or 2nd Semester)

SOA–101: PROBLEM OF DRUG ABUSE

Time: 3 Hours **Credit 3-0-0**

Total Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section – A

Meaning of Drug Abuse:

i. Meaning, Nature and Extent of Drug Abuse in India and Punjab.
ii. Consequences of Drug Abuse for:

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

Section – B

Management of Drug Abuse:

i. Medical Management: Medication for treatment and to reduce withdrawal effects.
ii. Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
iii. Social Management: Family, Group therapy and Environmental Intervention.

Section – C

Prevention of Drug Abuse:

i. Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
ii. School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

Section – D

Controlling Drug Abuse:

i. Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
ii. Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

References:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection.* Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcohalism. Harmond Worth:* Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society.* New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism,* Smoking obscenity New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,* Cambridge University Press.
13. Verma, P.S. 2017, "*Punjab's Drug Problem: Contours and Characterstics",* Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

Bachelor of Architecture (B.Arch.) (Semester-III)
(Credit Based Evaluation and Grading System)

Course Code : ARL–201 **Duration of Examination: 3 Hrs**

Course Title: Building Science–III (Climatology) **Credits : 03 (L=2,T=1,U=0)**

Minor Test: 20%

Assignment/Seminar/Case Study/Minor Project: 20%

Quiz/ Group Discussion: 10%

End Semester Examination: 50%

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Contents:

SECTION - A

Global Climatic Factors (Tropics): Basic Elements of Climate, Temperature, Humidity, Wind, Solar Radiation, Vegetation, etc., their measurements and effect. Climate zones and their classification–Tropical Climate, Cool Temperate, Hot–arid, Warm–Humid, etc. Concept of Macro climate and Micro Climate.

SECTION - B

Thermal Qualities: Heat and Temperature, Solar Factor, Concept of Thermal Comfort, Heat Balance of Human Body, Effective Temperature and Corrective Effective Temperature, C.E.T. Analysis,

SECTION - C

Heat Flow through Buildings. Concept of U–value, Heat Balance Equation of Buildings. Convection, Conduction, Radiation, Conductance, Resistance, Transmittance, etc.

Solar Radiation / Sun Angles: Solar Radiation, Position of Sun and methods of Recording it, Solar Penetration inside Buildings, Solar Charts, Solar Azimuth Angle, Solar Altitude Angle, Shadow Angle Protector, Design of Shading Devices – Horizontal and Vertical Shadow Angles and Vertical and Horizontal Shading Devices.

SECTION - D

Wind: Wind Direction and speed and their impact on Design of Window openings, Heating and cooling effect through topography and Orientation of Buildings, Air Pattern inside and Around the Buildings. Position, Placement and size of windows.

Micro Climate: Effects of Topography and natural built up surroundings. Human comfort conditions and design of various building element to gain comfort, Site selection Site planning and Orientation of Buildings. Application of All Climatic Factors on the Design of Buildings, Traditional / Vernacular Shelter Design for Various Climatic Zones.

Suggested Readings:

1. Koenigsberger, O.H Ingersoll, T.G Mayhew, A.Szokalay 2015 " Manual of tropical housing and building" – Orient Longman Pvt Ltd UK.
2. Olgay,V; "Design with Climate", Princeton University Press,London,1963.
3. Ewans, Martin, "Climatology", MN: Lerner Publications Company, Germany,1971
4. Krishan, Arvind; "Climate Responsive Architecture", Tata Mc Graw Hill, New Delhi.
5. Lal. D.S; "Climatology", Sharda Pustak Bhawan, Allahabad, 2001

Bachelor of Architecture (B.Arch.) (Semester-III)
(Credit Based Evaluation and Grading System)

Course Code : ARL–202 **Duration of Examination 3 Hrs**
Course Title: Theory of Design –I **Credits : 03 (L=2,T=1,U=0)**
Minor Test: 20%
Assignment/Seminar/Case Study/Minor Project: 20%
Quiz/ Group Discussion: 10%
End Semester Examination: 50%

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course contents:

SECTION - A

Theory of design, its scope and application, Elements of design: Mass, space, line, colour, texture, proportions. Principles of design: Rhythm, Balance, Harmony, Contrast, Variety. Objectives of design: Beauty, Order, Efficiency, Usefulness, Economy. Scale: Importance of scale in Architecture, Architectural scale, Human scale and monumental scale. Role of Color in Architecture, Theory of colors, effects and properties of colors, Organization of form & space, Mass space relationship.

SECTION - B

Introduction to Form, Function and Circulation. Interrelationship of Form, Function and circulation in Architectural design.
Function: Formal & informal function, Zoning, Hierarchy of functions, activity charts and interdependence of form and function, functionalism and concepts of form follows function.
Circulation & Activity: Movement through space, Hierarchy of circulation spaces and linkages, various circulation patterns, Path space relationship and typology of the circulation space, Horizontal & vertical circulation and Movement as part of Activity. Analysis and classification of Circulation: Elements of horizontal and vertical circulation

SECTION - C

Design Process: Design brief, Area programme analysis, Concept and Design development:
Design objectives, Thrust areas, Design methodology, Design idea and its evolution through design development, 3 dimensional visualization. Contextualization: Historical, Physical, Socio cultural & economic context.

SECTION - D

Design considerations for various building types such as Residential, Commercial, Institutional, Industrial and Recreational. Architectural character and Style, Study of modern and traditional Iconic buildings

Suggested Readings:

1. Ching, Francis D.K.; “Architecture form space and order”, Van Nostrand Reinhold, NY, 1996.
2. Smith, C. Ray; “Interior Design in the 20th Century”, Harper & Row, 1986
3. Bunce, Fredrick W.; “The Iconography of Architectural Plans”, D.K. Print World,2002
4. Rompilla, Ethel; “Color for Interior Design”, Harry M. Abrams. Inc. Publisher, 2005

Bachelor of Architecture (B.Arch.) (Semester-III)
(Credit Based Evaluation and Grading System)

Course Code : ARU–203 **Duration of Examination 4 Hrs**

Course Title: Architectural Drawing–II **Credits : 05 (L=1,T=0,U=4)**

Internal Assessment: 50%

End Semester Examination: 50%

Course Contents:

Section-A

Perspective (Normal and Birds' eye view):

Introduction to basic terms, principles, types and techniques of perspective drawing

One and two point perspectives of building forms

Sectional Perspectives

Section-B

Sciography:

Introduction to basic principles of sciography and its application in the field of Architecture.

Study of shadow of objects on

- Horizontal surfaces
- Vertical surfaces
- Inclined surfaces
- Curved surfaces
- Complex surfaces

Sciography of buildings/ building components in plan and elevation

Suggested Readings:

1. D'Amelio, Joseph; "Perspective Drawing Handbook", Dover Publications, New York, 2004.

2. Smith, Ray; "Introduction to Perspective", Dorling Kindersley Publishers Ltd.,1999.

3. Warren, P.E. & Luzadder, J; "Fundamentals of Engineering Drawing",Prentice Hall,1977

4. Wyatt, William E.; "General Architectural Drawing", Chas. A. Bennett Co., Inc. 1969.

5. Bhatt, N.D.; "Engineering Drawing", Charotar; Tenth Edition, New Delhi, 1996.

INSTRUCTIONS FOR THE EXAMINER / PAPER SETTER

- Two questions are to be attempted by the candidates one from each section.
- Reasonable choice should be given.

Bachelor of Architecture (B.Arch.) (Semester-III)
(Credit Based Evaluation and Grading System)

Course Code : ARU–204 **Duration of Examination 4 Hrs**
Course Title: Building Construction –III **Credits : 05 (L=1,T=0,U=4)**
Internal Assessment: 50%
End Semester Examination: 50%

Course Contents:

Section-A

1 a) Various type of floors and floor finishes.
b) Various types of wall construction
- Cavity wall
- Hollow/ Solid block wall
- Dhajji wall
- Dry Wall

Section-B

2 a) Different types of staircase and their various construction techniques

Staircase: Dog legged, Open well, Spiral, Helical
Construction Techniques: Waist slab, Cantilever, Folded slab, Central beam, M.S. stair-case

b) Section through a double storied building incorporating all relevant construction details.

Suggested Readings:

1. Bindra, S.P & Arora, S.P.; 'Text Book on Building Construction", D. R & Sons, 1977.
2. Watson, Don A.; "Construction Materials and Processes", McGraw Hill Co., New York 1972.
3. Mckay, W.B.; "Building Construction", Vol.1, 2, 3 Longmans, U.K. 1981.
4. Alanwerth; "Materials", The Mitchell Pub. Co. Ltd., London, 1986.
5. Chudley, R.; "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990.
6. Barry, R.; "Building Construction", East West Press, New Delhi, 1999.

Guidelines for Teachers:
The emphasis shall be laid on sequence and procedure/ methodology of construction.

INSTRUCTIONS FOR THE EXAMINER / PAPER SETTER

- Total three or four questions to be attempted by the candidates depending upon the length of the paper.
- Atleast one question to be set from each section.
- Reasonable choice should be given.

Bachelor of Architecture (B.Arch.) (Semester-III)
(Credit Based Evaluation and Grading System)

Course Code: ARU–205 **Duration of Examination: 12 Hrs.**
Course Title: Architectural Design–III **Credits: 08 (L=2, T=0, U=6)**
Internal Assessment: 50%
End Semester Examination: 50%

Intent:
Understanding the concept of vertical circulation, design of double-storeyed buildings

Course Contents:

Final drafting of measured drawings of student's own house, as per the summer project given at the end of B.Arch. second semester.

Design of

- Residential building with small work area like Artist's cottage/ Architect's residence/ Doctor's residence etc.
- Residential complex like Guest House/ Hostel/ Motel etc.

Suggested Readings:

1. Chiara, Joseph De; "Time Saver Standards for Building Types", McGraw–Hill Professional Publishing. 2001
2. Neufert, Ernst; "Architect's Data", 3rd Edition, Wiley–Blackwell, U.K., 2012.
3. Ching F.D.K; "Design Drawing", Van Nostrand Reinhold, 1998.
4. Smith P.F.; "Architecture and the Human Dimension", George Baldwin Ltd, 1979.
5. Ching F.D.K; "A Visual Dictionary of Architecture", Van Nostrand Reinhold, 1997.

INSTRUCTIONS FOR THE EXAMINER/ PAPER SETTER

- Topic of the architectural design problem should be written on the envelope containing the question paper. This topic is to be displayed on the notice board ten days before the examination.
- The preliminary submission shall be submitted at the end of four hours,which shall not be returned to the candidates, however the candidates may retain a copy of it.
- Any special sheet-handmade/ cartridge/ tracing sheet material to be supplied to the candidates should be written on the envelope containing the question papers.

Bachelor of Architecture (B.Arch.) (Semester-III)
(Credit Based Evaluation and Grading System)

ESL 220 ENVIRONMENTAL STUDIES (COMPULSORY)

Time: 3 Hrs. **Max. Marks: 100**

Teaching Methodologies
The Core Module Syllabus for Environmental Studies includes class room teaching and field work. The syllabus is divided into 8 Units [Unit-1 to Unit-VII] covering 45 lectures + 5 hours for field work [Unit-VIII]. The first 7 Units will cover 45 lectures which are class room based to enhance knowledge skills and attitude to environment. Unit-VIII comprises of 5 hours field work to be submitted by each candidate to the Teacher in-charge for evaluation latest by 15 December, 2019.

Exam Pattern: **End Semester Examination- 75 marks**
Project Report/Field Study- 25 marks [based on submitted report]
Total Marks- 100

The structure of the question paper being:

Part-A, Short answer pattern with inbuilt choice – **25 marks**
Attempt any five questions out of seven distributed equally from Unit-1 to Unit-VII.
Each question carries 5 marks. Answer to each question should not exceed 2 pages.

Part-B, Essay type with inbuilt choice – **50 marks**
Attempt any five questions out of eight distributed equally from Unit-1 to Unit-VII. Each question carries 10 marks. Answer to each question should not exceed 5 pages.

Project Report / Internal Assessment:

Part-C, Field work – **25 marks [Field work equal to 5 lecture hours]**
The candidate will submit a hand written field work report showing photographs, sketches, observations, perspective of any topic related to Environment or Ecosystem. The exhaustive list for project report/area of study are given just for reference:

1. Visit to a local area to document environmental assets: River / Forest/ Grassland / Hill / Mountain / Water body / Pond / Lake / Solid Waste Disposal / Water Treatment Plant / Wastewater Treatment Facility etc.
2. Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
3. Study of common plants, insects, birds
4. Study of tree in your areas with their botanical names and soil types
5. Study of birds and their nesting habits
6. Study of local pond in terms of wastewater inflow and water quality
7. Study of industrial units in your area. Name of industry, type of industry, Size (Large, Medium or small scale)
8. Study of common disease in the village and basic data from community health centre
9. Adopt any five young plants and photograph its growth
10. Analyze the Total dissolved solids of ground water samples in your area.
11. Study of Particulate Matter ($PM_{2.5}$ or PM_{10}) data from Sameer website. Download from Play store.
12. Perspective on any field on Environmental Studies with secondary data taken from Central Pollution Control Board, State Pollution Control Board, State Science & Technology Council etc.

Unit-I

The multidisciplinary nature of environmental studies
Definition, scope and importance, Need for public awareness

(2 lectures)

Unit-II

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems.

(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

(8 Lectures)

Unit-III

Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

(6 Lectures)

Unit-IV

Biodiversity and its conservation

- Introduction – Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

(8 Lectures)

Unit-V

Environmental Pollution

Definition

- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

(8 Lectures)

Unit-VI

Social Issues and the Environment

- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

(7 Lectures)

Unit-VII

Human Population and the Environment

- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

(6 Lectures)

Unit-VIII

Field Work

- Visit to a local area to document environmental assets river/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc

(Field work equal to 5 lecture hours)

References:

1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
2. Down to Earth, Centre for Science and Environment, New Delhi.
3. Heywood, V.H. & Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.
4. Joseph, K. & Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.
7. Sharma, J. P., Sharma. N.K. & Yadav, N.S. 2005. Comprehensive Environmental Studies, Laxmi Publications, New Delhi.
8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut.
9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi
10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House, New Delhi.

Course Code: ARL–251 **Duration of Examination 3 Hrs**
Course Title: Theory of Structures –II **Credits: 03 (L=2, T=1, U=0)**

Minor Test: 20%
Assignment/Seminar/Case Study/Minor Project: 20%
Quiz/ Group Discussion: 10%
End Semester Examination: 50%

Course Contents:

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION – A

Introduction to different methods used for the design of reinforced concrete structures, Working stress method, Ultimate load method, Limit state method, types of limit states, characteristic values, design values, factored load, comparison of limit state and working stress methods of design.

SECTION - B

Bulk Active Structure System: Concept development, laws of formation, spans, examples, merits and demerits.

Design of singly reinforced beams, doubly reinforced beams with various checks. Introduction to cantilever beams; depth thickness of section, Introduction to T beams and L beams. Effect of continuity of beams.

SECTION – C

Introduction to various types of slabs, difference b/w one way and two-way slab. Design of one-way slab; thickness of section, area of reinforcement, shear check, deflection check and design examples. Design of two-way slab; IS 456 code provisions, various checks. Introduction to flat slab and waffle slab.

SECTION –D

Design of columns; long and short columns, basic equation of design IS 456 code provisions, section of column, longitudinal and lateral reinforcement.

Introduction to various types of footings, Design of isolated footing, depth of footing from one-way shear criterion, from two-way shear criterion (punching shear and from bending moment criterion., Area of reinforcement and design examples

Suggested Readings:

1. A.K Jain, Reinforced Concrete – Limit State Design Publishing Tata McGraw–Hill.
2. S.N Sinha, Reinforced Concrete Design. Tata McGraw– Hill Publishing Company, New Delhi
3. P.Dayaratnam, Reinforced Concrete Design. Oxford & IBH Publishing Company.
4. Ramamurthan, Design of RCC Structures. Publisher: Dhanpat Rai (2015).
5. Ramchandra, Design of Concrete Structures. Publisher: Scientific Publishers Journals Dept (2011).
6. M.L.Gambir, , Design of Reinforced Concrete Structures – PHI Learning Pvt Ltd. (2010)

Bachelor of Architecture (B.Arch.) (Semester-IV)
(Credit Based Evaluation and Grading System)

Course Code : ARL–252 **Duration of Examination 3 Hrs**
Course Title: Building Science–IV **Credits : 03 (L=2,T=1,U=0)**
(Lighting & Acoustics)

Minor Test: 20%
Assignment/Seminar/Case Study/Minor Project: 20%
Quiz/ Group Discussion: 10%
End Semester Examination: 50%

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Contents:

SECTION - A

Architectural lighting, Aesthetics and functions, concept of daylight and interior light, calculation of luminance and glare.
Luminaire design, types of luminance and their application, luminance light source,

SECTION - B

Calculation of day light factor, illustrations required for various types of buildings such as residential, industrial, educational, recreational, health and cultural buildings.

SECTION - C

Fundamentals of sound – terminology, Principles of transmission and passage of sound. Factors influencing hearing conditions– Shapes, layouts, Sitting arrangements in Auditorium, Lecture Halls, Multipurpose halls, Reverberation, reflection and absorption of sound Reverberation time, Acoustical defects– Echo, Dead spot, sound foci, etc.

SECTION - D

Structure and air borne sound, sound absorption–coeff of different materials, classification and selection of various materials for acoustical correction, Materials of sound insulation for different nature of problem and circumstances.
Acoustical design of Class rooms, Lecture rooms, Multipurpose halls, Conference rooms, Auditorium etc. Calculation of Reverberation time and time delay.

Suggested Readings:

1. "Time Saver Standards – Building Services", Published by McGraw–Hill, New York, 2001.
2. Bindra – Arora, "Building Construction", National Book Trust, India, 1986.
3. Punmia, B.C; "Building Construction", Laxmi Publication,New Delhi, 1993.
4. Koenigsberger, O.H Ingersoll, T.G Mayhew, A.Szokalay 2015 " Manual of tropical housing and building" – Orient Longman Pvt Ltd UK.

Course Code: ARL–253 **Duration of Examination: 3 Hrs**
Course Title: History of Architecture-II **Credits: 03 (L=2, T=1, U=0)**

Minor Test: 20%
Assignment/Seminar/Case Study/Minor Project: 20%
Quiz/ Group Discussion: 10%
End Semester Examination: 50%

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Contents:

SECTION - A

Early Christian Architecture and Byzantine Architecture.

SECTION - B

Development of Romanesque Architecture in Italy, Central Europe, France.
Development of Gothic Architecture in France, Great Britain, Italy.

SECTION - C

Development of Renaissance Architecture (Early Renaissance, High Renaissance and Mannerism) in Italy. Development of Baroque Architecture in Italy.

SECTION - D

Development of Renaissance Architecture in Britain.
Influence of new building materials and technology on the development of architecture during Industrial Revolution.

Suggested Readings:

1. Fletcher, B; "A History of Architecture", Architectural Press, 1996.
2. Kostof, S.; "A History of Architecture", Oxford University Press, USA; 2nd Edition, 1995.
3. Giedion, S.; "Space Time and Architecture", Harvard U. Press; 5th edition, 2003.
4. Benevolo, L.; "History of Modern Architecture", Vol. I. The MIT Press, Cambridge, 1977.

Bachelor of Architecture (B.Arch.) (Semester-IV)
(Credit Based Evaluation and Grading System)

Course Code : ARU–256 **Duration of Examination 4 Hrs**
Course Title: Building Construction - IV **Credits : 05 (L=1,T=0,U=4)**
Internal Assessment: 50%
End Semester Examination: 50%

Course Contents:

Section-A

- Introduction to the various types of sloping roofs.
- Various type of steel trusses and roof coverings with fabrication and fixing details.

Steel trusses
– Flat
– Fink
– North light or saw tooth

Roof coverings
– A.C. Sheets/ G.I. sheets/ Fiberglass/ Polycarbonate/ MS Sheets

Section-B

- Construction of basements: Details and Waterproofing. Construction details of Sump and Ramps.
- Expansion joints in buildings.

Section-C

- Temporary supporting structures: Form work/shuttering (Pneumatic), Scaffolding, Shoring & underpinning.
- Various type of wall cladding: Glass wall with patch fittings, Aluminum Composite panels, Stone (Red sand stone/slates/granite/marble), Tile (brick/ vitrified) Grit block finish.

Suggested Readings:

1. Bindra, S.P & Arora, S.P. "Text Book on Building Construction", National Book Trust, India, 1986
2. Watson, Don A. "Construction Materials and Processes", McG.raw Hill Co., 1972.
3. McKay, W.B. "Building Construction", Vol.1, 2, 3, Longmans, U.K. 1981.
4. Alanwerth, "Materials", The Mitchell Pub. Co. Ltd., London, 1986.
5. Chudley, R. "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990.
6. Barry, R. "Building Construction", East West Press, New Delhi, 1999.

Guidelines for Teachers:

The emphasis shall be laid on sequence and procedure/ methodology of construction.
The extensive site visits shall be conducted for better understanding of the subject.

INSTRUCTIONS FOR THE EXAMINER / PAPER SETTER

- Total three or four questions to be attempted by the candidates depending upon the length of the paper.
- Atleast one question to be set from each section.
- Reasonable choice should be given.

Bachelor of Architecture (B.Arch.) (Semester-IV)
(Credit Based Evaluation and Grading System)

Course Code: ARU–257 **Duration of Examination: 12 Hrs.**
Course Title: Architectural Design–IV **Credits: 08 (L=2, T=0, U=6)**
Internal Assessment: 50%
End Semester Examination: 50%

Intent:

Understanding of vertical circulation, site planning, building services and structures as related to buildings upto five storey high and site up to five acres.

(As per norms of the barrier–free environment)

Course Contents:

- Design of a School upto Senior Secondary level (as per CBSE norms),
- Village Study (basic level)- study of a vernacular settlement with emphasis on socio-economic characteristics, climate and other geomorphic factors, local materials, building techniques, building typology, rural forms, spatial analysis, etc.
- Design of community facilities in a rural setting like library/ community centre/ museum/ aanganwadi/ baalwadi/ sanjh Kendra/ centre for adult education etc.

Suggested Readings

1. Chiara, Joseph De; "Time Saver Standards for Building types", McGraw–Hill Professional Publishing. 2001.
2. Neufert, Ernst; "Architect's Data", 3rd Edition, Wiley–Blackwell, U.K., 2002.
3. Ching; F.D.K, "A Visual Dictionary of Architecture", Van Nostrand Reinhold, 1997.

INSTRUCTIONS FOR THE EXAMINER/ PAPER SETTER

- Topic of the architectural design problem should be written on the envelope containing the question paper. This topic is to be displayed on the notice board ten days before the examination.
- The preliminary submission shall be submitted at the end of four hours,which shall not be returned to the candidates, however the candidates may retain a copy of it.
- Any special material to be supplied to the candidates should be written on the envelope containing the question papers.

Course Code: ARF–259 **Duration of Examination: Viva Voce**
Course Title: Project Oriented Study Tour **Credits: 01 (L=0, T=0, U=1)**

Objective: The main aim is to explore, study , analyze and understand the contemporary/ traditional/ historical architectural characteristics and details of areas, places, buildings in different parts of India and abroad.

The students shall visit places as recommended by the teachers-in-charge and approved by BOC.

General Guidelines for the Teacher

Study of building materials and details through sketches and photographs to be made as an individual student activity and is to be submitted in a report form. Study of concepts/ construction techniques and architectural characters for different sites/ buildings visited to be submitted in groups of students. Viva voce of individual student for both the submissions will be conducted by the teacher in-charge as part of the evaluation.

Bachelor of Architecture (B.Arch.) (Semester-IV)
(Credit Based Evaluation and Grading System)

Course Code : ARL–260 **Duration of Examination : Viva Voce**
Course Title: Computer Graphics **Credits : 03 (L=2,T=1,U=0)**
Internal Assessment: 50%
End Semester Viva voce: 50%

Course Contents:

SECTION A

Introduction to AutoCAD – Basics of Computer Aided Design, Application of AutoCAD in Architecture. Drafting using various co–ordinate systems–absolute, relative & polar relative.

SECTION B

Preparation of 2–D Drawings, use of various drawing commands for 2–D drawings generation and editing commands for modification of drawings. Application of layers.

SECTION C

3–D modeling – Use of various commands for 3–D solid and surface modeling. 3–D Editing commands.

SECTION D

Rendering of isometric views using various rendering commands
Use of layouts, concepts of x–ref, Preparation of rendered 3–D drawing projects,
Introduction to Photoshop and Google Sketchup

Suggested Readings:

1. Goldenberg, Joseph; "AutoCAD Architecture 2010 – Comprehensive Tutorial",Autodesk, 2010.
2. Aubin ,Paul F; "Mastering Auto CAD Architecture", 2010.
3. Elise, Moss , "Autodesk AutoCAD Architecture 2013 Fundamentals", SDC Publications, USA, 2013.
4. Gill, P.S.; "Engineering Graphics and Drawing", S.K. Kataria & Sons , New Delhi, 2010

Bachelor of Architecture (B.Arch.) (Semester-V)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARL–302 **Duration of Examination 3 Hrs**
Course Title: Building Services - I **Credits : 03 (L=2,T=01,U=0)**

PART I

- Importance and necessity of water supply schemes: Flow diagram
- **Quantity of Water**: Types of demands, domestic, commercial, industrial water demand, fire demand, per capita demand, prediction of population, hydrologic cycle, rainfall and run off, rainfall measurement.
- **Sources of Water Supply**: Surface sources, ground sources.
- **Collection of Water**: Different types of intakes, conveyance of water, pipe conduits, types of pipe materials, pipe joints
- **Quality of Water**: Impurities in water, Hardness in water, Standards of water quality
- **Purification of water**: Methods of treatment, sedimentation, filtration. Disinfection of water

PART II

- **Water Distribution System**: Classification of distribution, pressure in distribution systems, storage and distribution resources, layout of distribution system, appurtenances, water supply plumbing –individual buildings, fixtures and water storage in building.
- **Hot Water supply**: Hot water supply in single and multistoried buildings with special reference to National Building Code.

PART III

- **Sewerage and Sewage Disposal:**
  Basic definitions, methods of sewage Collection, types of sewers, and their layout, classification of sewerage system, sewer sections, sewer materials and joints, sewer appurtenances. Storm water determination and its drainage.
- **Drainage of Buildings**:
  Principles of Building drainage, Different types of pipes, traps, sanitary fittings, plumbing systems of drainage: Single stack system, one pipe system, two pipe system, pipe sizes and gradients. Complete Layout of Water supply and sanitary system in a building.
- **Disposal in un-sewered areas:** Different types of pits, septic tank, design of septic tank, disposal of septic tank effluent. Brief description about analysis of sewage, Oxygen demand, Natural methods of sewage disposal

Suggested Readings:

1. Birdie G.S., Birdie J.S.,"Water Supply and Sanitary Engineering," Dhanpat Rai & Sons, New Delhi, 2008.
2. Chatterjee A.K.,"Water Supply and Sanitary Engineering," Khanna Publishers, Delhi, 2009.
3. CPHEEO,"Manual on water supply and treatment,"Ministry of works and housing, New Delhi, 2010.
4. Engineer Manual, "Water Supply, Water Storage", EM 1110-3-163, Government Publications, 2009.
5. Khanna P.N.,"Indian practical Civil Engineer's handbook," Engineers Publishers, New Delhi, 1992.
6. Shah S. Charanjit, "Water Supply and Sanitation," Galgotia Publishing's, New Delhi, 2008.
7. Fair G.M,"Water-supply and waste-water disposal," John Wiley& Sons, 2009.
8. Mark J Hammer,"Water-supply and Pollution-control," Prentice-Hall Higher-Education, 2008.

Course Code: ARU–304 **Duration of Examination: 4 Hrs**
Course Title: Building Construction-V **Credits: 05 (L=1,T=0,U=4)**

- Steel and aluminum doors, windows and glazing., Panel steel (Box section)
- Special doors and their detailing like
    - Sliding
    - Sliding and folding
    - Collapsible
    - Rolling shutter (curtain lath + curtain rods)
    - Pivoted
- UPVC doors and windows
- Construction details of an interior like office, showroom, etc. incorporating the following details.
    - Layout of Office including workstations, Storage areas with different types of storage
    - Partitions (glass bricks, wooden, board),
    - Paneling (board, fiber–sheet, polycarbonate sheet, PVC interlocking sheets
    - False ceiling (Mineral Fibre, gypsum board, POP, aluminum section, plywood, canvas)
    - Cupboards, cabinets, counters and showcase/Display windows

Suggested Readings:

1. Kumar, Sushil; "Building Construction", Standard Publishers & Distributors, 1986
2. Ching, D.K. Francis; "Building Construction Illustrated", CBS Publishers & Distributors, New Delhi, 1999.
3. Chudley, R.; "Building Construction Handbook", British Library Cataloguing in Publication Data, UK, 2004.
4. Mckay, J.K.; "Building Construction Metric – Volume 4", Orient Longman Limited Publications, New Delhi, 2000
5. Goyal, M.M.; "Handbook of Building Construction – The essential source of standard construction practices", Jain book agency, 2004
6. Chudley, R & Greeno, R..; "Building Construction Handbook", Butterworth-Heinemann, 2006.
7. Barry, R., "Building Construction", East West Press, New Delhi, 1999.

Guidelines for Teachers:

The emphasis shall be laid on sequence and procedure/ methodology of construction.

Bachelor of Architecture (B.Arch.) (Semester-V)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARU–305 **Examination: Viva Voce**
Course Title: Architectural Design–V **Credits: 8 (L=2, T=0, U=06)**

Intent:

To develop an understanding of contextual factors in architecture through design of climate, environment and site responsive architecture.

Course Contents:

Design of

- Tourist resort/ artist's village/ cultural complex on a contoured site,
- Office building (public/ corporate sector),
- Memorial/ religious centre/ meditation centre etc.

Suggested readings:

1. Chiara, Joseph De; "Time Saver Standards for Building types", McGraw–Hill Professional Publishing. 2001.
2. Neufert, Ernst; "Architect's Data", 3rd Edition, Wiley–Blackwell, UK, 2002.
3. Mimi, Zeiger; "New Museum Architecture: Innovative Buildings from around the World", Thames and Hudson, UK, 2005.
4. Thomas A. Heinz; "Frank Lloyd Wright's Public Buildings", Gramercy Books, 2002.
5. Chris Van Uffelen and Chris Van Uffelen; "Contemporary Museums: Architecture – History-Collections", Braun Publishing

Bachelor of Architecture (B.Arch.) (Semester-V)
(Credit Based Continuous Evaluation and Grading System)

Subject Code: ARL–306 **Duration of Examination : 3 Hrs Course**
Title: Theory of Structures –III **Credits : 03 (L=2,T=1,U=0)**

Course Contents:

PART-I

Types of walls, Design of columns and walls in masonry; allowable stresses, cross sectional area factor, shape factor, slenderness ratio, effective height/ length, effective thickness, load factor and design examples. Design of foundations in masonry work; loads on foundation, safe bearing capacity, depth of foundation, Rankin's formula, section of footing, design examples. Retaining walls in masonry; loads, resultant pressure, conditions for stability of structure, middle third rule..

PART–II

Introduction to steel structures and methods of design. Various types of connections and failure modes. Behavior of compression members subjects to axial loading, effective length, slenderness ratio, permissible stresses. Design strength of tension members. Behavior of steel beams, classifications of cross-sections as per IS 800:2007; Design procedure and various checks. Behavior of steel truss members for given loading; compressive force and tensile force and reversal of forces.

PART–III

Surface Active Structure System: Singly curved shells, doubly curved Shells, Hyperbolic paraboloids and folded plates.
Form Active Structure Systems: Concept development, laws of formation, spans, examples, merits and demerits, Funicular structures (Cables and Arches), Tents and Pneumatic structures.
Introduction to load action on high rise buildings and various structural systems

Suggested Readings:

1. Anand S. Arya, "Masonry and Timber Structures" Name of Publisher "Nem Chand and Brothers, 2006".
2. Frederick Putnam Spalding "Masonry Structures" Name of Publihser: Bibliolife, 2008.
3. S.Ramamurthan,Design of Steel Structures. Year of Publication: 2010 Edition: Seventh Revised Jain Book
4. S.S.Bhavikatti, Design of Steel Structures by Limit State method of design., I.K.International publishing House Pvt. Ltd.2010
5. P.Dayratnam, Design of Steel Structures. S. Chand, 2008.
6. Duggal, Design of Steel Structures. Tata Magra Hill 2010.
7. Schueller, Wolfgang; "High Rise Building Structures", John Wiley & Sons, New York, 1976.
8. Otto, Frei.; "Pneumatic Structures", Vol., 2, Cable Structures. The MIT Press, London.

Bachelor of Architecture (B.Arch.) (Semester-V)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARL–308 **Duration of Examination 3 Hrs**
Course Title: Building
Specifications, Estimating and Costing **Credits : 03 (L=2,T=01,U=0)**

Course Contents:

PART I

Definition, scope and importance of specification in the building activities, Art of writing specifica- tions of material and construction works along with emphasis on the quality of the materials and proper sequence of construction works, method of writing correct order and sequence of use of mate- rials. Uses of standard specifications drafted by CPWD, PWD etc. Writing detailed specification for various building materials. Various test and properties related like bricks, Concrete, Cement, lime, sand, various types of mortars, timber, glass, etc.

PART II

Writing detailed specification for various construction works like earthwork for founda- tions, Brickwork, R.B. work, R.C.C. work, plastering and pointing, various types of flooring, white washing, distempering and painting, roof terracing, stone masonry.
Introduction to Estimates, types of estimate approximate and detailed methods of approximate esti- mating, plinth area methods, carpet floor area method, cubic content methods, approximate content method and number system.

PART III

Use of Microsoft Excel for estimating detailed estimate, procedure of estimating, taking out quantities, bill of quantities, schedule of rates.
Exercise in estimation of small buildings, Rate Analysis: Principles and analysis of different rate of labour and material, exercises in rate analysis of different building works i.e. Earth work for founda- tion, flooring. Introduction to P.W.D accounts procedure as per Common Schedule of Rates.

Suggested Readings:

1. Dutta, B.N; "Estimating and Costing", UBSPD Pvt. Limited, New Delhi (2009)
2. S.C. Rangwala; "Elements of Estimating and Costing", Charoter Publishing House, Gujarat.
3. W.H. King and D.M.R. Esson; "Specification and Quantitative for civil Engineers", The English University Press, Ltd.
4. "T.N. Building Practice", Vol., 1, Civil, Govt. Publication.
5. "P.W.D. Standard Specification", Govt. Publication.
6. "C.P.W.D. Standard Specifications", Govt. Publication.
7. Chakarborti. M; "Estimating, Costing, Specification and Valuation in Civil Engineering," M. Chakraborti, Kolkatta, 1990.
8. National Building Code", 2005.
9. "PWD Schedule of Rates", 2010.

Bachelor of Architecture (B.Arch.) (Semester-V)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL–309 **Duration of Examination: 3 Hrs**
Course Title: History of Architecture-III **Credits: 03 (L=2,T=01,U=0)**

Course Contents:

PART I

Emergence of early Indo Islamic style of Architecture under the different Muslim dynasties. Early Turkish Sultans, Khilji, Lodhi, Tughlaq, Sayyiads. Architecture of tombs, mosques, forts, palaces, and cities. Study of concepts, spatial forms, and elements of architecture. Islamic Architecture in Northern & Southern Provinces. Emphasis on Golconda, Bijapur, Bidar, Gulbarga, etc. Study of Architectural principles and elements in all major structures.

PART II

Architecture in Mughal period. Study of major structures in Delhi & Agra. Emphasis on town planning of Mughal cities. Analysis of tombs, mosques, forts & palaces made during Mughal era.

PART III

Sikh Architecture –Architecture of Gurudwaras with special emphasis on Golden Temple, Development of Sikh Architecture in Punjab. Planning of Sikh cities. Study of various structures and their elements.

Colonial Architecture in India under the British Raj with special emphasis on Architecture of New Delhi, Calcutta, and Bombay.

Suggested Readings:

1. Nath, R., "History of Mughal Architecture", Abhinav Publications. New Delhi, 1985.
2. Arshi, P.S., "Sikh Architecture in Punjab", Intellectual Publishing House. New Delhi, 1985.
3. Sahai, Surinder, "Indian Architecture Islamic Period 1192–1857", Prakash Books, New Delhi, 2004.
4. Tadgell, Christopher, "The History of Architecture in India", Phadion Press Limited. 1994.
5. Habib, Irfan; "Medieval India the Study of a civilization", National Book Trust. 2008.
6. Dogra, Ramesh Chander. Dogra, Urmila; "The Sikh World– An Encyclopedia Survey of Sikh Religion and Culture", UBSPD Publishers. 2006.
7. Brown, Percy; "Indian Architecture (Islamic Period)", D.B. Taraporewala sons & co. pvt. Ltd., Mumbai, 2010.
8. Grover, Satish; "Islamic Architecture in India", Galgotia Publishing Company, New Delhi, 1996

Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARL–351 **Duration of Examination 3 Hrs**
Course Title: Building Services - II **Credits : 03 (L=2,T=01,U=0)**

Course Contents

PART I

Electrical

Basic principles of electrical circuits; Ohm's and Kirchoff law. Calculation of power load distribution for residential buildings. Bulk supply system and location of campus transformers. Introduction to electrical fittings and electrical appliances. Systems of electrical wiring commonly used. Wires specification and current carrying capacity.

PART II

Mechanical: Fire Fighting

Classification of fire, classification of building according to fire load, causes and spread of fire. Combustibility of material and fire resistance provision in buildings from fire safety angle. Fire fighting equipment and types of fire extinguishers. Fire protection, means of escape – fire detection and alarm systems, heat and smoke detectors, fire dampers, fire doors, water curtains, etc. Comparison of detectors. Mechanical and Communication systems.

PART III

Mechanical: Conveyor Lifts

Principles of functioning, control and operation of lifts. Machine room and its equipments, lift well and pit. Ideal location, ventilation, number and size of life cars. Escalator functioning – installation and suitability of escalators. Inter–communication and monitoring devices – System and equipment.

Air Conditioning

Introduction & basic principles of air conditioning, difference between air cooling and air conditioning. Requirements of comfort conditions, control of temperature, and humidity. Means of mechanical ventilation. Various systems of air conditioning and equipment required for air conditioning like blowers and exhaust fans, fan coil units (FCU) and air handling units (AHU) etc.

Suggested Readings:

1. Jain, V.K; "Handbook of Designing and Installation of Services in Building Complex", Khanna Publisher, New Delhi, 1998.
2. Gupta, J.B; "Electrical Installation, Estimating and Costing", S.K. Kataria & Sons, New Delhi , 2002.
3. Hammer, Mark J; "Water-supply and Pollution-control", Prentice-Hall Higher-Education, 2008.

Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARU–354 **Duration of Examination : 3 Hrs**
Course Title: Building Construction VI **Credits : 05 (L=1,T=00,U=04)**

Course Contents:

- Working Drawings of a residential unit incorporating the following details:
  - Demarcation plan
  - Foundation details
  - Working/ dimensions at all floor levels.
  - Terrace plan
  - Elevations/ Sections
  - Joinery Details
  - Staircase Details
  - Electrical Plan
  - Plumbing/ sanitary layout
  - Toilet Details (Wall hung W.C.s, Location of conceals/ angle valves)
  - Kitchen Details (layout with latest gadgets, details etc.)
- Appraisals of Commercial Kitchens in Hotels/ Hostels etc.
- Case studies/ detailing of Public Toilets
- Visit to Factory/ Display centers of Kitchens and Toilets

Suggested Readings:

1. Watson, Don A; "Construction Materials and Processes", McGraw Hill Co., University of Michigan, 1972.
2. McKay, W.B. "Building Construction", Vol. 1,2,3,4, Longmans, U.K., 1981.
3. Alanwerth, "Materials", The Mitchell Pub. Co., Ltd. London, 1986.
4. Chudley, R. "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990.
5. Barry, R. "Building Construction", East West Press, New Delhi, 1999.

Guidelines for Teachers:

The emphasis shall be laid on sequence and procedure/ methodology of construction.

Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARU–355 **Examination: Viva voce**
Course Title: Architectural Design- VI **Credits: 8 (L=2, T=0, U=06)**

Intent:
To develop an understanding regarding the significance of specialized functions, building services etc. through design of environment responsive architecture.

Course Contents:
Design of

- Group housing (including EWS as per bye laws),
- 200 bedded hospital,
- Shopping mall/ stadium/gymnasium.

Suggested readings:

1. Chiara, Joseph De; "Time Saver Standards for Building types" McGraw–Hill Professional Publishing. 2001
2. Neufert, Ernst, "Architect's Data" 3rd Edition, Wiley–Blackwell, UK, 2002.
3. Unterman, Richard & Robert, Small; "Site planning for cluster housing", Van Nostrand Reinhold, 1977.
4. Chiara, J.D; Panero J; Zelnik M; "Time Saver Standards for Housing and Residential Development ", 2nd Edition, McGraw Hill, 1995.
5. ChristineNickl-Weller, Hans Nickl, Verlagshaus Braun; "Hospital architecture", 2009.
6. Geraint John & Rod Sheard, "Stadia, A Design and Development Guide", Architectural Press, University of Michigan, 2000.
7. Michelle Provoost, Matthijs Bouw & Camiel van winkel; "The Stadium: Architecture of Mass Sport", Rotterdam: NAI Publishers, 2000.

Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARF–356 **Duration of Examination :viva voce**
Course Title: Project Oriented Study Tour **Credits : 01 (L=0,T=0,U=1)**

Objective: The main aim is to explore, study, analyze and understand the contemporary/ traditional/ historical architectural characteristics and details of areas, places, buildings in different parts of India and abroad.

The students shall visit places as recommended by the teachers-in-charge and approved by BOC.

General Guidelines for the Teacher

Study of building materials and details through sketches and photographs to be made as an individual student activity and is to be submitted in a report from. Study of concepts/ construction techniques and architectural characters for different sites/ buildings visited to be submitted in groups of students. Viva voce of individual student for both the submissions will be conducted by the teacher in-charge as part of the evaluation

Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL–358 **Duration of Examination 3 Hrs**

Course Title: Surveying & Leveling **Credits: 03 (L=2, T=1, U=0)**

Course Contents:

PART I

LINEAR MEASUREMENTS

Different methods, Instruments for Chaining, Ranging out survey lines, chaining, chain triangulation. Field Book, Field work, Instrument for setting out right angles, Obstacles in chaining, introduction to total station survey; methods and specifications.

COMPASS SURVEYING

Bearing & angles, Theory of magnetic compass, Prismatic compass magnetic declination and local attraction.

PART II

PLANE TABLE SURVEYING

General: Accessories, Working operations, methods of plane tabling. Intersection, Traversing, Resection, 3 point problems, Errors in plane tabling, Advantages & disadvantages of plane ta- bling.

CONTOURING

Contour interval, Characteristics of contours, Interpolation of contours, contours gradient, Use of contours maps, computation of volume of earth from contour plans, calculation of Areas, Use of Planimeter.

PART III

LEVELING

Definitions, methods of leveling, dumpy level, leveling staff, Temporary adjustment of a level, Theory of direct leveling, Differential leveling, Booking & Reducing levels, Balancing B.S.& F.S., Cross sectioning. Theodolite & its structure, Definition & terms, Measurements of horizon- tal angles.

Suggested Readings:

1. Punmia, B.C. “Surveying and Levelling” by Laxmi publication.
2. Duggal, S.K. “Text Book of Surveying” Published by Tata McGraw–Hill ninth reprint 2008.
3. Clendinning & Oliver,“Surveying” published for the Institutes of Surveyors in Queensland, New South Wales, Victoria, South Australia, Western Australia and Tasmania by the Queensland Institute of Surveyors.
4. Arora, K.R. “Principles & use of Surveying Instruments”

Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARL–362 **Duration of Examination 3 Hrs**
Course Title: Theory of Design – II **Credits : 03 (L=2,T=01,U=0)**

Course Contents:

PART 1

Introduction to Modern Architecture, Reasons for evolution of modern architecture, origins – Neoclassicism and Revivalism – works of Ledoux and Boullee Durrand. Socio–Cultural and Technical transformations that led to Advent of Modern Architecture. Arts & Crafts in England, Willium Morris, Structure Rationalism & influence of Violet Le Duc, Art Nouveu – Victor Horta, Antonio Gaudi

PART 1I

The design philosophy and exemplary works of Louis Sullivan and Frank Lloyd Wright – the evolution of their philosophy through various stages of early works, midlife and late years. The principles of organic Architecture. Walter Gropius and Mies Van Der Rohe , New –Conception of Spaces, Paul–Ruddlph Brutalism. Aalvar Aalto–Spatial Compositions and Abstract Masses. The design philosophy & exemplary works of Le Corbusier. Pluralism in the 1970s, The exemplary works and design philosophy of Eero Saarinen, John Utzon, Louis I Kahn, Philip Johnson. Elementary reference to Post – Modernism in the west, Works of Venturi, Rossi, Michel Graves

PART III

Post Independence influence of Modern Masters, Corbusier and Kahn in India. Indian Modern Architects. A.P. Kanvinde, Joseph Allen Stein, Charles Correa. Balkrishna Doshi (early works). Regionalism – Raj Rewal, Late works of Doshi and Laurie Baker. Globalization and its impact on India, rise of Indian and Multi–National corporations and their architecture.

Suggested Readings:

1. Bahga, Sarabjit, Surinder Bahga and Yashinder Bahga "Modern Architecture in India", Galgotia Publishing Co., New Delhi, 1993.
2. Bhatt, Vikram and Peter Seriver; "Contemporary Indian Architecture": After the Masters, Ahmedabad. 1990
3. Correa, Charles M; "The New Landscape", Bombay Strand Books, 1985.
4. Frampton, Kenneth; "Modern Architecture: A Critical History", Thames & Hudson, UK, 2007.
5. Giedion Sigfried; "Space, Time and Architecture", Harvard University Press, 2009.
6. William, J. Curtis; "Architecture since 1990". Phaidon Press Limited, London, 1982
7. Lang, Jon, Madhavi Desai & Mili Desai; "Architecture and Independence- The Search for Identity – India 1880–1980", Oxford University Press (Selected Portions only), 1997.
8. Edward, R. Ford; "The Details of Modern Architecture", The MIT Press, 2003.

Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL–359 **Duration of Examination: 3 hrs**
Course Title: Maintenance and Adaptation of Buildings **Credits: 03 (L=2,T=1,U=0)**

Course Contents:

PART I

- Introduction, Operation, maintenance and Repair of Buildings, Distress in structures, Causes of distress, defects and decay, Damage and detection of damage. Classification of maintenance works, Annual Budgetary provision. Determination of approximate age of buildings. Determination of strength of a member of a Building. Economics of Building-cost in use.
- Maintenance of foundation - Repair, settlement- causes, Grillage foundation, Excavation of existing foundation to check its capacity and how to strengthen it. Anti-termite treatment.
- Maintenance of walls: Dampness, causes, effects and remedies. - Efflorescence : causes, effect and remedies

PART II

- Use of concrete in building structures. Factors affecting durability of concrete. Maintenance and rehabilitation and repair of concrete structure. Physical examination of common defects and damages. Inspection of cracks, causes of failure of R.C.C. structure. Strengthening of R.C.C. balconies and beams. Maintenance of steel structures - maintenance procedure and surface protection - welding and crack repairs. Merits and demerits of R.C.C. and steel structures.
- Cracks in structure, surface investigation. Remedial and preventive measures. Prevention while repairing load bearing walls. Repair to plaster, Bond between old and new brick wall.

PART III

- Maintenance of Roof: Precaution to be taken during construction of R.C.C. roof or masonry wall. Waterproofing of R.C.C. roof. Leakage in R.C.C. roof, Remedial measures. Advantages of lime concrete terracing, maintenance of Pitched roof. Expansion Joints in roof.
- Maintenance of Housing Estate, particulars and information, complaint book, Supervision of maintenance work. Maintenance funds. Maintenance planning - Importance of maintenance. Agency and role of maintenance manager. Importance of check list/ inspection test. Special commercial products used for maintenance and remedy of defects.

Suggested Readings:

1. Panchdhari AC; "Maintenance of buildings", New Age international (P) Limited, Publishers, New Delhi, 2003.
2. "Maintenance Manual of CPWD", DIRECTOR GENERAL (Works) CPWD, Nirman Bhawan, New Delhi, 2003
3. Chudley R.; "The Maintenance and Adaptation of Buildings", Longman Technical Se rvices, London, 1981.
4. Ransom W.H.; "Building Failures: Diagnosis and Avoidance", E. & F.N. Spon, London, 1987.
5. Panchdhari AC, "Water & Sanitary Installation", New Age International(P) Limited, Publishers ,New Delhi, 2005.
6. Hutchinson, Barton and Ellis, "Maintenance & Repair of Buildings", Butterworth & Co. (Publishers) Ltd., UK, 1975

Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Subject code: ARL 360 **Duration of Examination: 3 hrs**

Subject: Advanced Construction Materials & Techniques **Credits : 03 (L=2,T=1,U=0)**

PART-I

High-strength and high-performance concrete (HPC), self-compacting concrete (SCC), shotcrete, and textile or fiber reinforced concrete (FRC), porous concrete, Green concrete, geopolymer concrete. Production and pouring techniques

PART-II

Pre cast concrete structures, pre stressing & post tensioning & their methods, prefabrication and its advantages & disadvantages. Slip form and lift construction.

PART-III

Functional requirements, methods of construction of trusses & girders, frames & their types, Shell roofs (singly curved, doubly curved & hyperbolic paraboloids), beam grid structures, Y-beams, space frame construction, Choice of roof structures.

Suggested readings:

- Mohamed Abdallah El-Reedy, "Advanced Materials and Techniques for Reinforced Concrete Structures, Second Edition",CRC Press, Nov 2015
- Newman and Choo, "Advanced Concrete Technology, Constituent Materials, 1st Edition", Butterworth-Heinemann, Oct 2003
- Daniel Schodek, "Structures", Prentice Hall India, 2008
- Engel H, "Structure system", Gerd Hatje **Publishers**,1997

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Bachelor of Architecture (B.Arch.) (Semester-VI)
(Credit Based Continuous Evaluation and Grading System)

Subject Code: ARL–361 **Duration of Examination 3 Hrs**

Course Title: Architectural Journalism **Credits: 03 (L=2,T=1,U=0)**

Course Contents:

PART–I

- Architectural report writing: The need and purpose; Procedure and Guidelines for writing architectural Project report. Analysis of recent historical and contemporary examples of written and journalistic criticism of architecture, space and design; Discursive techniques, analysis of major critical themes, thematic categories in architectural writing over centuries.
- Preparation of case studies and prototype studies.
- Role of Graphics and report writing.
- Use of computers in report writing- Enabling Software such as MS Word, MS Power Point, MS Excel, etc.

PART–II

- Works of Indian and international writers, professional art and architecture critics such as Vikram Bhatt, Vincent Scully, Gautam Bhatia etc. be presented and discussed.
- Writing articles for journals on proposed architectural projects, existing building complexes, historical buildings, interior design projects, landscape design works

PART–III

- Photo journalism
- Book reviews
- Page compositions
- Writing reviews on materials and products related to architecture, exhibition related to art and architecture.
- A write-up to assess how successful the architect and others involved with the project have been in meeting both the criteria the project set out to meet and those that the critic himself feels to be important. Specific criteria include:
  Aesthetics, Proportion, Functionality, Architectural style, Choice and use of building materials
  Built environment or context, Sustainability

Suggested Readings:

1. Al-Asad, Mohammad, Majd Musa. 2006, *Architectural Criticism and Journalism: Global Perspectives*, Turin,Umberto Allemandi.
2. Bender, Thomas.1988, Architecture and the Journalism of Ideas. Design Book Review: DBR no.15,
3. Journal- Architectural Research.

Bachelor of Architecture (B.Arch.) (Semester-VII)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARE–401 **Duration of Examination: Viva Voce**
Course Title : Practical Training **Credits : 20**

Periods per Week:
The total period of practical training will be of 24 weeks.

Internal Assessment: **25%**
Internal Assessment shall consist of periodical reports as given below:
1. Joining Report
2. Monthly Progress reports (6nos.) 20 marks each.

University Examination
University examination shall consist of:
1. Study of building **25%**
2. Final Viva–Voce **50%**

Study of Building:
This includes a building design analysis for a study report which the students are required to do in extra office hours. The study should comprise of multifaceted aspects of any building or a complex in the final stage of construction. This shall put under following heads:

1. Design Concept 2. Space Usage 3. Circulation
4. Climate responsiveness 5. Façade Treatment & Architectural Expression
6. Built in Furniture 7. Services 8. Construction Techniques
9. Materials used etc. 10. Conclusions

Viva Voce:
The following work done by students during the office hours must be submitted:
Drafting, Tracing, Perspectives, Models, Submission Drawings, Working drawings, drawings and details.

Note:
i. The maximum number of blue prints to be submitted at the time of viva–voce is restricted to 16. Such prints shall be attested by the employer. The prints should cover the important projects done during the training.
ii. At least one complete project of any nature should form part of submission, the drawings and site supervision of which should have been handled by the students.
iii. The final viva voce will be conducted by the jury consists of the Head of the department/nominee of the Head and external examiner/s outside the department.

Bachelor of Architecture (B.Arch.) (Semester-VIII)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL–451 **Duration of Examination: 3 Hrs.**
Course Title: Housing **Credits: 03 (L=2, T=01, U=0)**

Course Contents:

PART I

- Shelter, house and housing; housing typology – detached, semi–detached, row housing, walk up apartments, multi–storeyed housing; plotted and flatted development; housing density– gross and net density, role of density indices and measures in housing layout.
- Present housing scenario in India and global overview.

PART II

- Housing as a major component of a settlement, neighborhood concept, Radburn lay-out, Clarence Perry's principles of layout, physical elements, community facilities, design criteria; selectionofhousingtypes,circulationetc. ;concept of sustainable housing.
- Housing standards–meaning, purpose & criteria, standards prescribed by HUDCO, NBC etc.
- Traditional housing and settlement pattern- layout, character, housing typology and design

PART III

- Problems of slums and housing for the poor–definition of slums, factors responsible for creation,features, Govt. schemes for improvement; cost effective materials and techniques, approach of Laurie Baker,HUDCO (Building Centres), CBRI and others.
- Techniques of appraisal of housing enclaves, physical, social, economic and environmentalcomponents; surveys – definitions, importance, types, advantages, disadvantages, sample,sampling, preparation of questionnaire–types, sequence and format of questions. Conduct of a housing survey.

Suggested Readings:

1. AlexanderChristoper.1977. *A Pattern Language*. Oxford University Press, New York.
2. Chiara, J.D, Panero J, Zelnik M.(ed). 2009. *Time Saver Standards for Housing and Residential Development 2nd Edition*. McGraw Hill.
3. Gallion A.B. & Eisner S. 1975.*Urban Pattern: City Planning and Design*. Van Nostrand, NewYork.
4. Lynch Kevin. 1990. *City Sense and City Design*. MIT press,USA.
5. Peloquin Albert .1994. *Barrier Free Residential Design.* Mcgraw Hill Inc, USA.
6. Schoenauer, Norbert. 2000.*6000 Years of Housing*. W. W. Norton & Company,New York.
7. Unterman, Richard & Small, Robert.1977. *Site Planning for Cluster Housing*. Van Nostrand Publishers, New York.
8. Williams Jo. 2012. *Zero Carbon Homes- A Road Map.* Earthscan, New York.

Bachelor of Architecture (B.Arch.) (Semester – VIII)
(Credit Based Evaluation and Grading System)

Course Code : ARL–452 **Duration of Examination: 3 hrs**
Course Title : Urban Design and Conservation **Credits: 03 (L=2,T=1,U=0)**

Course Contents

PART I

Introduction to Urban Design theory, raw materials of Urban Design i.e. districts, nodes, landmarks, edges and paths. Determinants of Urban Form – scale, texture, grain and activity patterns. Building typology and its impact on urban forms and merging boundaries of Architecture and Urban Design.

PART II

The role of urban conservation and relevance of historic areas in present concept, issues related with physical deterioration of built heritage and its preservation, concepts and policies of conservation of built environment, the role of various international and national agencies. An Urban Design study of built environment of historical/ new developments covering various aspects such as imageability, morphology and legislation etc.

PART III

The shape and structure of cities- pattern, styles and trends in history, urban design tools- policy design and legislative tools, bye laws, concepts and practices understanding urban design models.

Suggested Readings:

1. Bacon, Edmund N., "Design of Cities", Thames and Hudson, London, 1967.
2. Broadbent, G; "Emerging Concepts in Urban Space Design", Van Nostrand Reinhold, London, New York, 1990.
3. Krier, Rob; "Urban Space", Academy Editions, London, 1979.
4. Lynch, Kevein; "The image of the City", MIT Press, Cambridge, Massachusetts and London, 1960.
5. Lynch, Kevein; "Good City Form", MIT Press, Cambridge, Massachusetts, 1982.
6. Mumford, Lewis, "The City in History", Secker and Warburg, London, 1961.
7. Spiregen, Paul D; "Urban Design: The Architecture of Town and Cities", McGraw Hill, New York, 1965.
8. J. Larkham, Peter; "Conservation and the City"; *Rout Ledge. London and New York, 1st edition 1996.*
9. Feilden, Bernard M.; "Conservation of Historic Buildings", *Architectural Press; 3rd edition, 2003.*
10. Menon, A.G.K. & Thapar, B.K.; "Historic Towns and Heritage Zones", *INTACH, edition 2002.*
11. Parajuli, Yogeshwar K.; "Bhaktapur Development Project – Experience in Preservation and Restoration in a Medieval Town", edition 1974-85.

Bachelor of Architecture (B.Arch.) (Semester-VIII)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARU–454 **Duration of Examination: 4 hrs.**
Course Title : Building Construction VII **Credits: 05 (L=1,T=0,U=4)**

Course Contents:

- Detailing of curtain walls and wall claddings.
- Types of Elevators & Escalators, making coordination drawings w.r.t. Shop drawings
- Construction details of prefabricated and precast building components
- Construction details for earth quake resistant structures (low rise)
- Swimming pool details types/materials/construction techniques/services
- Site construction details such as: Road cross sections/ Longitudinal sections, Construciton of pedestrian pathway, Ramps, Rain water harvesting details.
- Introduction to Rebarring

Suggested Reading:

1. Watson, Don A; ”Construction Materials and Processes”, McGraw Hill Co., University of Michigan, 1972.
2. Mckay, W.B. “Building Construction”, Vol.1, 2, 3 Longmans, U.K. 1981.
3. Alanwerth, “Materials”, The Mitchell Pub. Co. Ltd., London, 1986.
4. Chudley, R; “Building Construction Handbook'”, British Library Cataloguing in Publication Data, London, 1990.
5. Barry, R.; “Building Construction”, East west press, New Delhi, 1999.

Guidelines for Teachers:

The emphasis shall be laid on sequence and procedure/ methodology of construction.

Bachelor of Architecture (B.Arch.) (Semester-VIII)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARU–455 **Examination: viva voce**
Course Title: Architectural Design – VII **Credits: 08 (L=2, T=0, U=6)**

Intent:
To develop an understanding, of the spatial form, traditional/contemporary/ vernacular architecture.

Course Contents:

- Documentation and study of historic/heritage buildings/complexes, assessment of values and present state of conservation to prepare proposals/recommendations

  OR

  Area level study (bazaars, neighbourhoods, nodes etc.) in an urban/rural setting.

  OR

  Village Study (advanced level)- study of a vernacular settlement with emphasis on socio- economic characteristics, climate and other geomorphic factors, local materials, building techniques, building typology, rural forms, spatial analysis, etc.

- Transport terminals (bus/ railways/ domestic airport)

  OR

  Institute for higher learning (having auditorium, OAT, sports facilities, and interaction areas etc. as per UGC norms).

Suggested Readings:

1. Chiara, Joseph De; "Time Saver Standards for Building types", McGraw–Hill Professional Publishing. 2001
2. Neufert, Ernst; "Architect's Data", 3rd Edition, Wiley–Blackwell. 2002.
3. Kanvinde Achyut P.& Miller H James; "Campus design in India : experience of a developing nation", Jostens/American Yearbook Co., United States, 1969.

Course Code: ARL–459 **Duration of Examination: 3 Hrs**
Course Title: Landscape Architecture **Credits: 03 (L=2, T=01, U=0)**
Course Contents:

PART-I

Introduction: Definition, objective, scope and relevance of Landscape Architecture, Global and local environmental issues; Ecology: meaning and relevance of its study, building as a component in the ecological set up. Garden styles – formal and informal; History of garden styles viz. Italian, French, Persian, Mughal and Japanese.

PART-II

Site Planning: meaning, purpose and methodology; site surveys: types, relevance, components; Functional and technical factors in site planning; Principles and goals of landscape design; types of landscape styles – hard and soft landscape, wet and dry landscape. Landscape design elements: types, materials, use and relevance. Hard and soft landscape, water as an important element,

PART-III

Plants: Functional, aesthetic and environmental aspects of plant; Types and forms of plants; criteria for plant selection; characteristics (height, foliage, flowering etc.) of various plants, their common and botanical names. Preparation of a landscape scheme. Landscape project at house level, neighborhood level etc.

Suggested Readings:

1. Rogers, Elizabeth Barlow; “Landscape Design: A cultural and Architectural History”, First Edition. Harry N. Abrams, 2001.
2. Sullivan, Chip, Boult Elizabeth. Illustrated history of Landscape design, John wiley & Sons, 2010.
3. Swaffield, Simon.R.. “Theory of Landscape Architecture”, A Reader. University of Pennsyl- vania Press, 2002.
4. Booth, Norman. K.. “Basic elements of Landscape architectural design”, Waveland Press, 1989.
5. Ingels, Jack E. “Landscaping: Principles and Practice”, Publishers Delmar Cengage Learning, USA, 2004.
6. Laurie, Michael. “An Introduction to Landscape Architecture”, American Elsevier Publishing Co., USA, 1961.
7. Randhawa, M.S; “Flowering Trees”, Indian Council of Agricultural Research, India,1957.
8. Stuart V.C.M. “Gardens of the Great Mughals”, Cosmo Publishers, London, UK, 1987.
9. Geoffrey and Susan Jellico; “The Landscape of Man”, Van Nostrand Reinhold, USA.
10. Morrow, Baker H. “A dictionary of Landscape Architecture”, University of Mexico Press, 1987.
11. John L. Motloch; “Introduction to landscape design”, John Wiley & Sons; 2nd Edition, 2000

Bachelor of Architecture (B.Arch.) (Semester-VIII)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL–453 **Duration of Examination: 3 Hrs**
Course Title: Vernacular Architecture **Credits: 03 (L=2,T=01,U=0)**

PART I

Introduction to Vernacular Architecture: Meaning and nature of Vernacular Architecture, Evolution of shelter forms in the varied geographical contexts, Natural and manmade determinants of form: geographical, climatic, historical, anthropological, aesthetic, spatial, folkloristic etc. Relevance in the modern context.

PART II

Vernacular Architecture in the Plains of Northern India: Building typologies, construction materials and techniques, architectural elements and art forms, functional and aesthetic aspects of vernacular dwellings and the settlement pattern in the plains of Punjab and Rajasthan.

Vernacular Architecture in the Hills of Northern India: Building typologies, construction materials and techniques, architectural elements and art forms, functional and aesthetic aspects of vernacular dwellings and the settlement pattern in the Hills of Northern India.

PART III

Relevance and interpretation of vernacular architecture in today's context. Approach and works of architects Laurie Baker, Hassan Fathy. Role of Building centers (HUDCO), 'Appropriate' building materials and technology.

Introduction to the concepts of Vaastu, study of scientific aspects of vaastu shastra, relevance of directions.

Suggested Readings:

1. Langenbach, Randolph & Yang, Minja; "Don't Tear It Down! Preserving the Earthquake Resistant Vernacular Architecture of Kashmir", Oinfroin Media, 2009.
2. Schoenauer, Norbert; "6000 Thousand years of Housing", W.W. Norton, New York, 2000.
3. Thomas Carter, Elizabeth Collins Cromle; "Invitation to Vernacular Architecture: A Guide to the Study of Ordinary Buildings and Landscapes", University Of Tennessee Press, 2005.
4. Oliver, Paul; "Dwellings: The Vernacular House World Wide", Phaidon press, 2003.
5. Udamale, Sanjay; "Architecture for Kutch", English Edition, Mumbai, 2003.
6. L. Asquith, Lindsay Asquith (Editor), Marcel Vellinga (Editor); "Vernacular Architecture in the 21st Century: Theory, Education and Practice", Publisher: Taylor & Francis Group, UK, 2006.
7. Oliver, Paul; "Built to Needs", Architectural Press (2006)
8. Jain, Kulbushan & Jain, Meenakshi; "Architecture of the Indian Desert", Aadi Centre, Ahmedabad, 2000.
9. Oliver, Paul; "Encyclopedia of Vernacular architecture of the World", Cambridge University Press, 1997.
10. Pramar, V.S. Haveli; "Wooden houses & mansions of Gujarat", Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
11. Tillotsum, G.H.R.; "The Tradition of Indian architecture - Continuity & Controversy - Change since 1850", Oxford University Press.
12. Kagal, Carmen; "Vistara – The architecture of India", The Festival of India, 1986.
13. Rappoport, Amos; "House, Form & Culture", Prentice Hall Inc, University of Michigan, 1989.

Course Code: ARL – 457 **Duration of Examination: 3 hrs Course**
Title: Hospital Architecture **Credits: 03 (L=2, T=1, U=0)**

Course Contents:

PART I

- A principled approach to hospital planning:
- Functional Planning
- General Principles
- Grouping of Elements
- Circulation
- Environment
- Aesthetics, Lighting, Colour, Ambience

Types and Levels of Health Services:

- Super Specialty
- Nursing Homes
- Rural Dispensary
- Ayurveda & Nature Cure

PART II

Planning and Designing Medical Services – Outpatient services, Emergency services, clinical laboratories, radiologic services, diagnostic radiology, radiation therapy department, nuclear medicine, surgical department and new concepts for O.T., labour and delivery suites, physical medicine and rehabilitation. Nursing units and intensive care units, Mortuary.

PART III

Planning and designing supportive services and engineering services. Admitting department, central sterilization and supply department, pharmacy, food service department, laundry and linen services, engineering department, electrical system, air conditioning system, water supply and sanitary system, centralised medical gas system, fire safety. Medical Education Complexes

Suggested Readings

1. Kunders, G.D., Gopinath, S. & Katakam, Asoka, “Hospitals – Planning design and management”, Tata MC Graw Hill publishing company Ltd, New Delhi, 2001.
2. Rosenfield, Isadore; “Hospital Architecture and Beyond”, Van Nostrand Reinhold Company, New York.
3. Rotterdam, Bouwcentrum; “General Hospitals”, Elsevier publishing company, Amsterdam.

Bachelor of Architecture (B.Arch.) (Semester-VIII)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL – 458 **Duration of Examination: 3 hrs Course**
Title: Disaster Management **Credits: 03 (L=2, T=1, U=0)**

Course objective:
The course would focus on types of Environmental hazards and Disasters. The main objective is to study the emerging approaches in Disaster Reduction and Management. The emphasis will be on programmes of National and International organizations for Disaster preparedness, mitigation and awareness.

Course contents:

PART - I

Natural Disasters – meaning and nature of natural disasters, their types and effects. Floods, droughts, cyclones, earthquakes, landslides, avalanches, volcanic eruptions, heat and cold waves, Climatic change: global warming, sea level rise, ozone depletion.

Man made disasters – Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, air pollution, water pollution, deforestation, industrial waste water pollution, road accidents, rail accidents, air accidents, sea accidents.

PART - II

Disaster management – Effect to mitigate natural disaster at national and global levels. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community based organizations and media. Central , state, district and local administration; Armed forces in disaster response; Disaster response; Police and other organizations. Meaning of environmental hazards, Environmental Disasters and Environmental stress, concept of Environmental hazards, environmental stress and Environmental Disasters.

PART - III

Earthquake hazards/disasters – Engineering seismology, plate tectonics, seismic waves, earthquake size and various scales, local site effects, causes of Earthquakes, hazardous effects of earthquakes, Indian seismicity, seismic zones of India, Earthquake hazards in India, Human adjustment, perception and mitigation of Earthquake.

Seismic design concepts, EQ load on simple buildings – load path – floor and roof diaphragms – seismic resistant building architecture – plan configuration – vertical configuration – pounding effects – mass and stiffness irregularities – torsion in structures.

Suggested Readings:

1. Srivastava, H.N. & Gupta, G.D.; Management of Natural Disasters in Developing Countries; Daya Publishing House, New Delhi, 2006.
2. Lusted, Marcia Amidon; Natural Disasters, ABDO Publishing Company, U.S.A. 2011.
3. Roxanna Mcdonald; Introduction to Man-made and Natural Disasters and their effects on buildings, Taylor & Francis, 2003.
4. Ramroth, William G. Jr.; Planning for Disaster – How Natural & Man-made Disasters shape the Built Environment; Kaplan Publishing, USA, 2007.
5. Donovan, Jenny; Designing to Heal: Planning and Urban Designing Response to Diaster and Conflict; CSIRO Publishing ,Australia, 2013.
6. Pauw, C. De & Lauritzen, E.K.; Disaster Planning, Structural Assessment, Demolition and Recycling, Taylor & Francis, UK, 2005.

Bachelor of Architecture (B.Arch.) (Semester-IX)
(Credit Based Continuous Evaluation and Grading System)

Subject Code: ARL–501 **Duration of Examination: 3 Hrs**
Course Title: Town Planning **Credits: 03 (L=2, T=1, U=0)**

Course Contents:

PART- I

History of Town Planning: Overview of urban growth and form in ancient societies, classic cities of the Greek and Roman periods, medieval town, the renaissance and neo-classic city, the industrial revolution and factory towns; Salient features of the ideas and concepts of Ebenezer Howard and Sir Pattrick Geddes.

PART- II

Introduction to town planning: Concept of a town/ city/ urban area, town classification, town as a physical, social and political entity, town vs. regional planning, meaning, importance and scope of town planning, planning process; Theories of urban structure: concentric zone, sector and multiple nuclei theory.

Preparation of Plans: Master Plan and its components, concept of perspective, development and annual plans; concept of zoning (use, height and density zoning); landuse planning (residential, commercial, industrial, etc.); urban aesthetics.

PART- III

Planning surveys: Importance of surveys, various categories of surveys such as physical, socio-economic, traffic, etc., survey process, data collection, presentation and analysis; New towns: Planning considerations and application of spatial standards; Case study of Chandigarh (planning considerations & planning concept).

Local Agencies: Role of various planning and development authorities - Municipal Corporation, Improvement Trust, Punjab Urban Development Authority.

Suggested Readings:

1. Catanese, A.J. and Snyder, J.C. (1979), 'Introduction to Urban Planning', McGraw-Hill Inc., New York.
2. Das, A.K. (2007), 'Urban Planning in India', Rawat Publications, Jaipur.
3. Gallion, A.B. and Eisner, S. (1983), 'The Urban Pattern: City Planning and Design', D. Van Nostrand Company, New York.
4. Greed, Clara (2004), 'Introducing Planning: Introducing Planning', Continuum, London.
5. Keeble L. (1972), 'Principles & Practice of Town and Country Planning', The Estates Gazette Ltd., London.
6. Kopardekar & Diwan (1994), 'Urban and Regional Planning–Principles, Practice and Law', S.H. Kopardekar, Talegaon – Dabhade.
7. Kulshrestha, S.K (ed) (2006), 'Dictionary of Urban and Regional Planning', Kalpaz Publications, Delhi.
8. Ministry of Urban Affairs & Employment (G.O.I.), (1996), 'Urban Development Plans Formulation and Implementation Guidelines', ITPI, New Delhi.
9. Saini and Mahavir, (1985), 'Urban Development Planning Strategies and Techniques', Central Electric Press, Delhi.
10. Thooyavan, K.R. (2005), 'Human Settlements – A Planning Guide to Beginners', MA Publication, Chennai.
11. Whittick A. (1974), 'Encyclopedia of Urban Planning', McGraw-Hill, New York.

Bachelor of Architecture (B.Arch.) (Semester-IX)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL – 502 **Duration of Examination: 3 hrs Course Title: Construction Management** **Credits: 03 (L=2, T=1, U=0)**

Course Contents:

PART I

Introduction to construction management, its significance, objectives and functions, construction planning and scheduling using bar charts and network techniques, development and analysis of CPM networks. Modular co-ordination, its objectives, basic planning and structure modules.

PART II

Cost time analysis in network planning, basic terms, concept of optimized cost, procedure of cost time optimization in network planning, exercising shall networks to determine the optimum duration & cost.

PART III

Inspection and quality control its need on work sites, principles of inspection, stages of inspection and quality control for –Masonry R.C.C and earth work, various method of testing of structures, importance of safety on construction sites.

Equipments used in building industry like earthmoving equipments, compaction equipments, excavating equipments hauling equipment. Mixing equipment, Hoisting equipment.

Suggested Readings:

1. Punmia, B.C. & Khandelwal K.K., "Project Planning and Control with PERT\CPM", Laxmi Publications, New Delhi, 2009.
2. Mukhopadyay, S.P.; "Project Management for Architects and Civil Engineers", IIT, Kharagpur, 1974.
3. Wiest, Jerome D. & Levy, Ferdinand K.; "A Management Guide to PERT/CPM", Prentice Hall of Indian Pub.Ltd. New Delhi, 1982.
4. Burgess, SR.A. & White, G.; "Building production and Project Management", The Construction Press, London 1979.
5. Dr. P. N. Modi; "PERT and CPM", Standard Book House, New Delhi, 2009.

Bachelor of Architecture (B.Arch.) (Semester-IX)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARU–505 **Duration of Examination: viva voce**
Course Title : Building Construction – VIII **Credits: 5 (L=1,T=0,U=04)**

Course Contents:
Production of set of detailed working drawings along with project report including

- Estimates
- Water supply and sanitation drawings
- Specifications
- Schedules using network techniques

Suggested Readings:

1. Watson, Don A., "Construction Materials and Processes", McGraw Hill Co., 1972.
2. Mckay, W.B., "Building Construction", Vol.1, 2, 3, Longmans, U.K. 1981.
3. Alanwerth, "Materials", The Mitchell Pub. Co. Ltd., London, 1986.
4. Chudley, R., "Building Construction Handbook", Addison Wesley, Longman Group, England, London, 3rd ed. 1999.
5. Barry, R., "Building Construction", East West Press, New Delhi, 1999.
6. Ching, Francis D. K. ; "Building Construction Illustrated", Wiley
7. Arora, S.P. & Bindra, S.P.; "A Text Book of Building Construction", Dhanpat Rai & Sons, New Delhi.
8. Chudley, R., "Construction Technology", Vol. I, II, III, IV, Longman Group Limited, London, Ist Edition, 1977.
9. Ataev, S.S; "Construction Technology", Mir Publishers, Moscow, 1985

Guidelines for Teachers:
The emphasis shall be laid on sequence and procedure/ methodology of construction.

Bachelor of Architecture (B.Arch.) (Semester-IX)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARU–506 **Examination: viva voce**

Course Title: Architectural Design – VIII **Credits: 8 (L=2, T=0, U=06)**

Intent:
To develop an understanding regarding design issues related to problems of urban development incorporating structures, services, vehicular movement and site planning.

Course Contents:

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Design of

- District Centre/ IT Park.
- Five star hotel and convention centre.

Suggested readings:

1. Chiara, Joseph De; "Time Saver Standards for Building types", McGraw–Hill Professional Publishing. 2001
2. Neufert, Ernst; "Architect's Data",3rd Edition, Wiley–Blackwell, UK, 2002.
3. National building code of India, Bureau of Indian Standards, New Delhi, 2005.
4. Watt D., Surveying Historical Buildings, Donhead Publishing Limited, 2011.

Bachelor of Architecture (B.Arch.) (Semester-IX)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL – 507 **Duration of Examination: 3 Hrs**
Course Title: Professional Practice & Building Bye Laws **Credits : 03 (L=2,T=01,U=0)**

Course Contents:

PART I

Definition and aspects of the architectural profession, Role of the Architect: Relationship with the clients and contractor, duties, legal responsibilities. Indian Institutes of Architects: Aims objectives, conditions for engagement and scale of Professional charges, code of professional conduct. Council of Architecture: Its role of regulating the profession and education in Architecture.

PART II

Valuation: Classification of value and ownership, purpose of valuation.
Easements: Characteristics, continuous and discontinuous, easements, modes of acquiring easements.
Competitions: Its purpose and guidelines, Nature and type of competitions, Registration procedure, conditions for conducting architectural competitions, Board of Assessors, Advisors, Prize money and Honorarium.

PART III

Building Bye–Laws: Role in the healthy development of Architecture.
Development Control Rules & General Building requirements as per NBC – Terminology, Requirements of Plots, classification of Buildings, open spaces, Area & height limitations, off street – parking spaces, requirements of parts of buildings.
Study of local building bye–laws
Points of general interest in bye laws of Chandigarh

Suggested Readings:

1. Namavati, Dr.Roshan.H., Professional Practice With Elements Of Estimating, published by- Anup Lakhani, Mumbai
2. Shah, Charanjit Singh; Architect's Handbook Ready Reckner; Published by – Galgotia Publishing Company, New Delhi.
3. National Building Code-2005; Published By- Bureau of Indian Standards.

Bachelor of Architecture (B.Arch.) (Semester-IX)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL503 **Duration of Examination: 3 hrs**
Course Title: Green Buildings **Credits: 03 (L=2, T=1, U=0)**

Course Contents:

PART I

Introduction to concept of green buildings, efficient use of energy, water and other resources. Pro- tecting occupant health and improving employee productivity. Reduction in waste, pollution and en- vironment degradation. Sustainable design to achieve environmental, economic and social benefits. Concept of L.C.A (life cycle assessment)

PART II

Energy Efficiency – active and passive techniques. Importance of passive techniques. Role of orien- tation, shading and vegetation. Solar gain for winters. Optimization of daylight. Solar water heating. Solar, wind, hydro and biomass power generation and use.

PART III

Operation and maintenance optimization, waste reduction and recycling.
Overview of various rating systems such as – BREEAM (U.K), LEED (U.S.A, Canada), CASBEE (Japan), Indian Green Building Council (IGBC), GRIHA.

Case studies of relevant green buildings with certifications and rating in India and Abroad. Seminar Presentation with report.

Suggested Readings:

1. Moore, Fuller; "Environmental Control Systems", McGraw Hill, Inc., New Delhi, 1993.
2. Konya, A.; "Design Primer for Hot Climates", Architectural Press, London, 1980.
3. "Climatically Responsive Energy Architecture", Efficient PLEA/SPA, New Delhi - 1995.
4. Ms.Sudha, Bansal, N.K. & Malik, M.A.S.; "Solar Passive Building", Pergamon Press.
5. Gupta, V.; Energy and Habitat - Wiley Eastern Limited, New Delhi.
6. Konya, A.; "Design Primer for Hot Climates", Architectural Press, London, 1980.
7. "Energy Efficient Buildings in India" , Published by TERI – 2001

Bachelor of Architecture (B.Arch.) (Semester-IX)
(Credit Based Continuous Evaluation and Grading System)

Course Code : ARL-508 **Duration of Examination : 3 Hrs**
Course Title: Sikh Architecture **Credits : 03 (L=2,T=1,U=0)**

Course Contents

PART I

- Introduction to Bhakti Movement, its principles and school of thought.
- Theology and Philosophy of Sikhism.
- Study of architectural philosophies of different Religions- Like- Buddhist, Islamic, and Hindu Styles.
- Introduction to Sikh settlements. Determinants, Forces and pressures for making of Sikh towns.
- An overview to Sikh Architecture.

PART II

- Design and details found in Sikh Shrines. e.g. Sanctum Sanctorum, Sarovar, Community Kitchen (Langar), etc.
- Spatial philosophies and architectural determinants.
- Materials and techniques used for construction
- Comparison between architectural philosophies of other Religions.

PART III

- Art forms in Sikh Architecture- Gach, Tukri, Jaratkari, Mohrakashi, Kalamkari. Their materials and techniques.
- Architectural elements of Sikh Shrines- their proportions, scale and other related design principles
- Case Study and analysis of Historic Sikh shrines and their vocabulary.

Suggested Readings:

1. Arshi, P. S. (2000). Sikh Architecture in Punjab. New Delhi: Intellectual Publishing House.
2. Arshi, P.S. (1989). The Golden temple: History, art, and architecture. Harman Publishing House, New Delhi.
3. Aryan K.C. (1977). “The pool of nectar (Golden temple)”. Marg, Vol. 30(3), June 1977. Bombay.
4. Atkinson, Robert. Bagenal Hope. 1926. “Theory and Elements of Architecture”. Robert m. McBride & company. New York.
5. Baumer, B. (1982). Rupa Pratirupa- Alice Boner Commemoration Volume. New Delhi: Sita Ram Goel for Biblia Impex Private Ltd.
6. Bhan Singh (1964). “Art of the Golden Temple”, Advance, Vol. XI, Nos. 3, July-Sept, Chandigarh.
7. Bhatti, S S. (2010). “Architecture and Sikhism – Golden Temple: A Marvel of Sikh Architecture”. Abstracts of Sikh studies. Vol XII, Issue 4 Oct-Dec 2010 / 542 NS. Chandigarh.
8. Bhatti, S.S. (2013). Golden Temple: Marvel of Sikh Architecture. Pittsburg. Rose-Dog Books.
9. Brown, Kerry. (1999). (Ed.) Sikh art and literature. London, Routledge.

10. Chahal, K. S. (2012). Understanding Sikh Architecture through the Sikh Shrines in East Punjab. Amritsar: PhD Thesis.
11. Ching, F. D. (2007). Architecture- Form, Space and Order. New Jersey: John Wiley and Sons.
12. Cunningham. (1849). History of the Sikhs, 1st edition, A, Mukherjee, Calcutta.
13. Datta, V.N. (1967). Amritsar Past and Present, Amritsar Municipal Committee, Amritsar.
14. Fauja Singh (1987). The City of Amritsar, Oriental Publisher and Distributors, New Delhi.
15. Ganda Singh. (1969). The Panjab Past and Present (translated from Fani Mohsin's Dabistan-i-Mazahib), Patiala.
16. Gurnam Singh (1960). Golden Temple, Super Press, New Delhi.
17. Kang, K. S. (1977). Art and architecture of the Golden Temple. Marg , 30.
18. Kaur, M. (2004). The Golden Temple. Amritsar: Guru Nanak Dev University.
19. Madanjit Kaur. (1983). Golden Temple: Past and present, Guru Nanak Dev University, Amritsar.

Bachelor of Architecture (B.Arch.) (Semester-IX)
(Credit Based Evaluation and Grading System)

Subject Code: ARL–509 **Duration of Examination 3 Hrs**

Course Title: Socio Economic Aspects of Architecture and Planning **Credits: 03 (L=2,T=1,U=0)**

Course Contents:

PART–I

Man and Environment. Traditional patterns and trends of change in Indian society. Concept of social institutions.

Relation between social structure and spatial structure. Social aspects of housing. Social problems of slums.

PART–II

Economic resource. Typology of goods, production economics, Process laws, product and costs, Economics of scale, valuation, typology of markets, land and real estate market macro-economic concepts

PART–III

Basic economic analysis, economic principles and land use, economic rent, land use pattern and land values.

An area level study of a settlement with reference to socio-economic aspects

Suggested Readings:

1. 2015 Ray Hutchison, Mark Gottdiener, Michael T. Ryan The Urban Sociology. (5th Edition) Perseus Books Group, Boulder.
2. 2010 William G. Flanagan Urban Sociology: Images and Structure. (5th Edition) Rowman & Littlefield. London.
3. Stonier & Hague : A text book of Economic Theory.
4. Shapiro, E. Macroeconomics Analysis, Harcourt, New York (Second Edition) (Chapter 1-6,17)
5. 2006. John Mcdonald and McMillen Danial. Urban Economics and Real Estate: Theory and Policy. Blackwell Publishing. U.K.

Bachelor of Architecture (B.Arch.) (Semester-X)
(Credit Based Continuous Evaluation and Grading System)

Course Code: ARL–551 **Duration of Examination: 3 Hrs**
Course Title: Architectural Conservation **Credits: 03 (L=2,T=01,U=0)**

Course Contents:

PART - I

Introduction to Conservation

Conservation, History of Conservation movement in West and India, Understanding various conservation Philosophies, Approaches and Principles, Understanding of various definitions and terminology such as Historicity, Heritage, Culture, Authenticity, Values, Transformations, Regeneration, Revitalization, Redevelopment, Integrated Conservation etc.

Inventories and Documentation

Introduction to Fundamental approaches and procedures for the inventories, Understanding process of identification and listing, Introduction to methods of documenting historic sites and structures through site sketches and measured drawings.

PART - II

Role of Charters and Various Agencies in Conservation Practice

Understanding the Concepts and policies of conservation of built environment with the relevance of Charters as a code of practice in conservation, the role of various international and national agencies (Archaeological Survey of India, Indian National Trust of Art & Cultural Heritage, International Council of Monuments & sites, World Heritage Committee, UNESCO) engaged in conservation practice and policy making.

PART - III

Assessment for State of Conservation of Historic Buildings

Issues related with physical deterioration of built heritage and its conservation, various types of defects/decays, its causes and classification of different agents of deterioration.

Role of Historic Building/Area/City in Present Context

Understanding Historic City by doing a study of its Heritage Components, various aspects for spatial Planning, the role of conservation and relevance of historic buildings/areas in present context

Suggested Readings:

1. Feilden, Bernard M.; "Conservation of Historic Buildings", *Architectural Press; 3rd edition, 2003.*
2. Feilden, Bernard M.; "Introduction to Conservation", *UNESCO, 1976.*
3. Latham, Derek; "Creative Re-use of Buildings", *Donhead, edition 2007*
4. Menon, A.G.K. & Thapar, B.K.; "Historic Towns and Heritage Zones", *INTACH, edition 2002.*
5. "International Charters for Conservation and Restoration" *(ICOMOS)*
6. Parajuli, Yogeshwar K.; "Bhaktapur Development Project – Experience in Preservation and Restoration in a Medieval Town", edition 1974-85.
7. Gupta, Divay, "Identification and Documentation of Built Heritage in India", INTACH, edition 2007
8. Petruccioli, Attilio; "After Amnesia – Learning from the Islamic Mediterranean Urban Fabric", *ICAR, edition 2009.*

Bachelor of Architecture (B.Arch.) (Semester-X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code: ARL - 552 **Duration of Examination: 3 hrs**
Course Title: Interior Design **Credits: 03 (L=2, T=1, U=0)**

Course Content:

PART I

Introduction to Interior Design Definition of Interior Design, Interior Design and architecture, Interior Design Process, themes and Concepts.

A Brief historical perspective of Interior Design in various periods Renaissance, Baroque periods, modern design

PART II

Elements of Interior Design – Enclosing Elements: Introduction to various elements in interiors like floors, ceiling walls, staircases, opening, etc. Use of materials and various methods of their treatment to obtain certain specific, functional, aesthetic and psychological effects.

Other elements of interiors like accessories used for enhancement of interiors – paintings, objects de art, furnishing i.e. shades, blends, curtains etc.

Lighting & Color in Interiors: Study of interior lighting – different types of lighting, their effects, types of lighting fixtures.

Colour – psychological impact, Colour Schemes, Specials Effects of Colour.

PART III

Furniture Design: Furniture selection in relation to human comforts, functions – materials, methods of construction, upholstery**.**

Layouts of various rooms – offices, children rooms, bedrooms, lounges etc.

Suggested Readings:

1. Steport- De- Van Kness, Logan and Szebely*; "Introduction To Interior Design"*; MacMillan Publishing Company, New York, 1980
2. Ching, Francis.D.K.; "*Interior Design Illustrated"*; V.N.R. Publisher, New York, 1987
3. Evans, Helen Maries; "*An Invitation Of Design"*; MacMillan Publishing Company, New York, 1982
4. Penero, Julius and Zelnik, Martin; "*Human Dimension and Interior Space"*; Whitney Library of Design, New York, 1979
5. Karthryn, B. Hiesinger and George H. Marcus; "*Landmarks of 20th Century Design",* Abbey Villey Press, 1993
6. Syanne Slesin and Stafford Ceiff, "*Indian Style 3"*, Clarkson N. Potter, New York, 1990
7. Karl J Neilson, David A Taylor; "*Interiors- An Introduction"*; McGraw Hill Higher Education, USA, 2010.
8. Allien Tate, C Ray Smith; "*Interior Design in 20th Century"*; Harper and Row, New York, 1986.
9. Riggs, J Rosemary; "*Materials and Components Of Interior Architecture"*; Prentice Hall, 1998

Bachelor of Architecture (B.Arch.) (Semester-X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code: ARL – 553 **Duration of Examination: 3 hrs**
Course Title: Multistoried Buildings **Credits: 03 (L=2, T=1, U=0)**

Course Contents:

PART I

- Development of High-rise buildings in the course of History, Technology and the environment, Infrastructural, Economical, Social and ecological aspects of high-rise development
- The need for effective conceptual Multi-storied design process, Design criteria for Multi-storied buildings, Need for Multi storied development
- A Study of reasons for and methods of high rise developments in our urban centers.
- Siting of multi storied buildings.
- Form of multi storied buildings and their effect of urban-scape psychological implication of using such spatial organizations, consequences of multi-storied building development.

PART II

Load action on High rise building, various structural systems and construction methods, Introduction to various types of Foundations, Design of various building components

PART III

Services in multi storied buildings such as Plumbing System, HVAC, Electricity, Sewerage system, Fire fighting, Vertical Circulation System and Efficient evacuation methods.

Note: The above course contents should be supported with live built examples.

Suggested Readings:

1. Viswanath H.R., Tolloczko J., Clarke J.N., "Multi-purpose High-rise Towers and Tall Buildings", Spon Press, London, 1998.
2. Engel H., "Structure Systems", Van Nostrand Reinhold Company, 1981.
3. Kowalczyk R.M., Sinn R, Bennetts I. D. , Kilmister M.B., "Structural systems for tall buildings", McGraw-Hill, 1995.
4. Armstrong P. J.; "Architecture of tall buildings", McGraw-Hill, 1995
5. Aoyama, H; "Design of modern high-rise reinforced concrete structures", Imperial College Press, 2001.
6. Taranath, B.S.; "Reinforced concrete design of tall buildings", CRC Press, USA, 2009.
7. Mittal, A K; "Electrical and Mechanical Services in high rise buildings", CBS, 2007.

Bachelor of Architecture (B.Arch.) (Semester-X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code: ARD – 554 **Duration of Examination: Viva–Voce**
Course Title: Architectural Thesis Project **Credits: 20 (L=0, T=0, U=20)**
(Weightage of Final/External Jury = 50%)

Brief Course Contents:

1. **Thesis:** Architectural thesis project represents the culmination point of the academic under graduate program; and offers an opportunity to the students to showcase their knowledge, expertise and skills in architecture acquired during the course of study. Each student, in consultation with the faculty, is expected to demonstrate his/her vision for bringing in positive changes to our built environment.

2. **Subject of Thesis*:*** Each student, within a specified time period, shall submit the subject of the thesis project he/ she proposes to work upon. The project may be live or hypothetical or conceptual one related to architecture; and must reflect its relevance to the trends in architecture across the globe. The students may commence their work on the subjects so proposed only after the approval of the Board of Control.

3. **Contents of Thesis*:*** An architectural thesis project shall comprise of the following:

a) A well formatted and neatly typed report illustrated through drawings, sketches, photographs, tables and diagrams; which should include Introduction to the Project (Project Brief, Validity, Aims and Objectives and Methodology), Literature Review, Prototype/ Case Studies, Site Analysis, Architect's Brief and Design Criteria, Conclusions and the Design Proposals.

b) Presentation Drawings and Model for the fully worked-out Design Proposal.

4. **Reviews and Internal Evaluations:** Each student will be assigned to a panel of thesis supervisors (hereafter referred to as panel) comprising of 3-4 members based on the norm of having one member for three/four students. The panel will be responsible for supervising and monitoring the progress as well as evaluating various stages of the thesis project as mentioned below:

Sr. No.	Stages	Max. Marks (% of total)	Details
1	Synopsis	5%	Project Brief, Validity/Need-Identification, Aims and Objectives Introduction to the Site and Methodology
2	Rough Report	15%	40-60 pages, A4 size, landscape format, font: times new roman, font size: 16, 14, 12, line spacing 1.5; margin 4 cm on left and 2.5 cm on the other sides
3	Preliminary Design Submission (Stage-1)	15%	The Basic Design Development, Worked out site plan and floor plans, architectural forms & expression, model/s etc.
4	Preliminary Design Submission (Stage-2)	15%	Detailed worked out Site Plan and Floor Plans, Sections, Elevations, Models etc.

5. Final Submission: Each student shall submit the final report, presentation drawings and model/s as part of the final submission which shall eventually be returned after the final evaluation process is over. In addition, each student shall also submit two identical copies of the final report along with a soft copy, complete in all respects, along with one hard copy for each member of the panel. The copies of the final report must also include A-3 size copies of all final drawings and at least two photographs of the final model/s.

6. External Evaluation: The Final Jury shall comprise of the Head of the department/his nominee and the external examiner/s. Weightage of marks assigned for external evaluation shall be 50% of the total marks. The final grades will be awarded by the Board of Control with all supervisors to be invited as special invitee, if they are not members of the Board of Control