FACULTY OF PHYSICAL PLANNING & ARCHITECTURE

SYLLABUS

FOR

B. ARCHITECTURE
(SEMESTER: I–VIII)
(Under Credit Based Continuous Evaluation Grading System)

(SEMESTER: IX–X) (Old System)

Session: 2013–14

GURU NANAK DEV UNIVERSITY AMRITSAR

B.ARCHITECTURE (Semester System)
(Under Credit Based Continuous Evaluation Grading System)

MISSION OBJECTIVES (For B.Arch. Course)

It is a Five Year Degree course with a blend of technicality and creativity along with historical inputs. It aims at combining theoretical knowledge base with field experience by the way of educational tours, site visits, practical training and workshop exercises. It trains the students to transform them into professionals who can handle all the phases of a building design.

In the First year of course, we start imparting knowledge about basics of history of architecture, structures, geology of earth on which the structures are to be built and building materials of which the structures are made. In it, knowledge is also imparted about basic construction techniques such as masonry wall construction, joinery (doors and windows) and section through single storey structures incorporating basic construction details. In creative aspect of course, students are made to learn design compositions using various colors, shapes and forms and gradually leading them to designing of small structures like milk bar, bus shelter and bachelor's house.

In the Second year, the students are exposed to technical aspects of the course through the study of structures, climatology, lighting and acoustics. Basic theoretical foundation is also built about the design in this very year through the study of theory of design. Students are made to learn advanced construction techniques of cladding and roofing along with the basics of structures like staircases, types of walls and slab construction. In the design aspect, students are made to handle residential and institutional building projects such as guest houses, apartments and institutes. Technological aspect is also taken care of by teaching the subject of computer application. Field exposure is given to the students by conducting study tour.

In Third year, students are prepared to proceed for practical training for the 4^{th} year, 7^{th} semester. In the light of above, students are given the complete knowledge of building services, estimation and in depth knowledge of theory of design. Students are also made to learn working drawings of project so as to equip them to work in professional office during training. In designing, students are made to handle public buildings, such as administrative, judicial complex, office buildings, I.T. parks, hospitals. Students are also given the exposure of modern as well as traditional architecture by conducting study tour.

Fourth year is divided in two parts. First part is dedicated to give them practical experience through the way of practical training of 24 weeks in professional organizations, where the students get the opportunity to work on live projects and experience the various stages of implementation of the project on site, under the guidance of professionals.

In the second part, after the training students are exposed to urban level studies through study of subjects like urban design, conservation and housing. In construction, students are made to learn advanced construction techniques such as curtain walls, prefabricated building components and earthquake resistant construction techniques. In the design aspect, they are made to handle conservation projects by documenting followed by designing of these projects.

In final year, students are inculcated with the managerial skills through project management and advanced construction technologies through study of subjects like multi-storey buildings, green buildings. Exposure is also given from urban level to town level planning through the subject of town planning. Students are also made to prepare exhaustive set of working drawing incorporating each and every construction detail learnt in the preceding course work. In designing, students are exposed to urban design projects such as district centers, industrial complexes.

Part two of final year is dedicated to architectural thesis. It gives the students an opportunity to prove that he/she has adequate ability to handle all phases of a building design. It is a subject for scholastic study through analysis. It is development and presentation of the design of a building including its setting in a specific environmental and its technical aspects.

B.ARCHITECTURE (Semester System)
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Scheme of Courses

Semester I (Autumn Semester)

S.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	IC	02	2	0	0	3hrs
8.	PBL–121	Punjabi Compulsory **OR**	IC	02	2	0	0	3hrs
9.	PBL–122	Basic Punjabi (Mudhli Punjabi)	IC	02	2	0	0	3hrs
		GRAND TOTAL:		**28**	**12**	**02**	**14**	

Semester-II (Spring Semester)

S.No.	Course Code	Course Title	Course Type	Credits	L	T	U	Duration of Exam.
1.	ARL–151	Theory of Structures–II	DC	03	2	1	0	3hrs
2.	ARL–152	Building Science –II (Building Materials)	DC	03	2	1	0	3hrs
3.	ARL–153	History of Architecture-I	DC	03	2	1	0	3hrs
4.	ARU–154	Arts & Graphics–II	DC	03	1	0	2	4hrs
5.	ARU–155	Workshop (Carpentry, Welding & Model Making)	DC	03	1	0	2	Viva Voce
6.	ARU–156	Building Construction-II	DC	05	1	0	4	4hrs
7.	ARU–157	Architectural Design-II	DC	05	1	0	4	6hrs
8.	ENL–151	Communicative English	IC	02	2	0	0	3hrs
9.	PBL–131	Punjabi Compulsory **OR**	IC	02	2	0	0	3hrs
10.	PBL–132	Basic Punjabi (Mudhli Punjabi)	IC	02	2	0	0	3hrs
		GRAND TOTAL:		**29**	**14**	**03**	**12**	

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Semester-III (Autumn Semester)								
Sr.No.	**Subject Code**	**Course Title**	**Course Type**	**Credits**	**L**	**T**	**U**	**Durtion of Exam**
1.	ARL–201	Theory of Structures–III	DC	03	2	1	0	3hrs
2.	ARL–202	Building Science –III (Climatology)	DC	03	2	1	0	3hrs
3.	ARL–203	Theory of Design–I	DC	03	2	1	0	3hrs
4.	ARU–204	Arts & Graphics –III	DC	03	1	0	2	4hrs
5.	ARU–205	Architectural Drawing–II	DC	05	1	0	4	4hrs
6.	ARU–206	Building Construction-III	DC	05	1	0	4	4hrs
7.	ARU–207	Architectural Design-III	DC	07	2	0	5	12hrs
8.	ESL–220	Environmental Studies (Compulsory)	IC	03	3	0	0	3hrs
GRAND TOTAL:				**32**	**14**	**03**	**15**	**–**

Note:- Credits of Paper ESL-220 will not be included in Grand Credits.

Semester-IV (Spring Semester)								
S.No.	**Course Code**	**Course Title**	**Course Type**	**Cred-its**	**L**	**T**	**U**	**Duration of Exam.**
1.	ARL–251	Theory of Structures–IV	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–254	Arts & Graphics–IV	DC	03	1	0	2	4hrs
5.	ARL–255	Surveying and Leveling	DC	03	2	1	0	3hrs
6.	ARU–256	Building Construction-IV	DC	05	1	0	4	4hrs
7.	ARU–257	Architectural Design-IV	DC	07	2	0	5	12hrs
8.	ARL–258	Computer Application	DC	02	2	0	0	Viva Voce
9.	ARF–259	Project Oriented Study Tour	DC	02	0	0	0	Viva Voce
GRAND TOTAL:				**31**	**14**	**11**		

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Semester -V (Autumn Semester)								
S.No.	Course Code	Course Title	Course Type	Credits	L	T	U	Duration of Exam.
1.	ARL–301	Structure Systems	DC	03	02	01	0	3hrs
2.	ARL–302	Building Services - I	DC	03	02	01	0	3hrs
3.	ARL–303	Theory of Design-II	DC	03	02	01	0	3hrs
4.	ARL–304	Estimating, Costing & Building Specifications	DC	03	02	01	0	3hrs
5.	ARU–305	Building Construction–V	DC	05	01	0	04	4hrs
6.	ARU–306	Architectural Design–V	DC	10	02	0	08	Viva Voce
		GRAND TOTAL:		**27**	**11**	**04**	**12**	

Semester -VI (Spring Semester)								
S.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.	ARL–352	History of Architecture– III	DC	03	02	01	0	3hrs
3.	ARL–353	Landscape Architecture	DC	03	02	01	0	3hrs
4.	ARU–354	Building Construction –VI	DC	05	01	00	04	4hrs
5.	ARU–355	Architectural Design–VI	DC	10	02	0	08	Viva Voce
6.	ARF–356	Project Oriented Study Tour	DC	02	00	0	0	Viva Voce
			GRAND TOTAL:	**26**	**09**	**03**	**12**	

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Semester–VII (Autumn Semester)							
S.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 inclusive of vacations.							

Semester –VIII (Spring Semester)								
S.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	ARL-453	Vernacular Architecture	DC	03	02	01	0	3hrs
4	ARU-454	Building Construction-VII	DC	05	01	00	04	4hrs
5	ARU-455	Architectural Design-VII	DC	10	02	00	8	Viva Voce
Elective Subjects (Any ONE of the following)								
5	ARL-456	Maintenance and Adaptation of Buildings	DE	03	02	01	0	3hrs
6	ARL-457	Hospital Architecture	DE	03	02	01	0	3hrs
			GRAND TOTAL:	**27**	**11**	**04**	**12**	
NOTE: - Students of Credit Based Continuous Evaluation Grading System (CBCEGS) shall opt about 10% of the courses from inter disciplinary/outside department courses with he approval of Board of Control. The U.G. students may opt for courses at U.G. Level/ Advance Diploma /Diploma/Certificate Courses of any Department.								

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Semester IX										
S.No	**Course Code**	**Course Title**	**Periods Per week**				**Int. Asses.**	**Uni. Exam**	**Total**	**Duration of Exam.**
			T	**L**	**TU**	**ST**				
1.	ARC-501	Town Planning	03	02	01	00	40	60	100	3 hrs
2.	ARC-502	Project Management	03	02	01	00	40	60	100	3 hrs
3.	ARC-503	Green Buildings	03	02	01	00	40	60	100	3 hrs
4.	ARC-504	Multistoried Buildings	03	02	01	00	40	60	100	3 hrs
5.	ARC-505	Housing	03	02	01	00	40	60	100	3 hrs
6.	ARC-506	Building Construction-VIII	06	01	00	05	120	80	200	4 hrs
7.	ARC-507	Architectural Design- VIII	12	02	00	10	180	120	300	Viva Voce
		GRAND TOTAL:	**33**	**13**	**05**	**15**	**500**	**500**	**1000**	**60**

Semester X										
S.No.	**Course Code**	**Course Title**	**Periods Per week**				**Int. Assess.**	**Uni. Exam.**	**Total**	**Duration of Exam.**
			T	L	TU	S T				
ELECTIVES (ANY ONE OF THE FOLLOWING FIVE THEORY SUBJECTS)										
1.	ARC-551	Advanced Structure System	03	02	01	00	40	60	100	3 hrs
2.	ARC-552	Interior Design	03	02	01	00	40	60	100	3 hrs
3.	ARC-553	Advanced Building Technology	03	02	01	00	40	60	100	3 hrs
4.	ARC-554	Urban Planning	03	02	01	00	40	60	100	3 hrs
5.	ARC-555	Architectural Conservation	03	02	01	00	40	60	100	3 hrs
6.	ARC-556	Architectural Thesis Project	*	*	00	00	200	450	650	Viva-Voce
		GRAND TOTAL:	**03**	**02**	**01**	**00**	**240**	**510**	**750**	

*Note: A teaching load of 2 periods per week for each student shall be allowed to the concerned thesis guide.

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

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

Course Contents:

PART I

Introduction to Elementary theory of structure, 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.

PART II

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.

Moment of resistance, theory of bending, bending stresses, basic equation of bending, section-modulus of rectangular and circular sections. Numerical problems.

PART III

Classification of frames, analysis of perfect frame, assumptions, method of sections, method of joints and design examples. Link polygon, method of construction, resultant of concurrent forces, non–concurrent forces, co– planar parallel force system and numerical problems.

Suggested Readings:

1. Punmia, B.C., Strength of Materials and Theory of Structures; Vol. I, Laxmi Publications, Delhi, 2010.
2. Ramamurtham, S., Strength of Materials, Dhanpatrai & Sons, Delhi, 2011.
3. Nash, W.A.,Strength of Materials – Schaums Series, McGraw Hill Book Company,1989.
4. Bansal, R.K., Engineering Mechanics and Strength of Materials, Lakshmi Publications, Delhi, 2009.
5. Rajput, R.K., Strength of Materials, S .Chand & Company Ltd., New Delhi 2010.

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–102 Duration of Examination: 3 Hrs
Course Title: Building Science –I Credits : 03 (L=2,T=1,U=0)
(Geology, Soils & Natural Calamities)

Course Contents:

PART I

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. Terminology and basic knowledge (causes & impact) of natural calamities–Earthquakes, Tsunami, Landslides, Floods, Volcanoes, Cyclones, derivatives Hurricanes etc.

PART II

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, soils as three phase system, water content, UNIT weight, specific gravity, void ratio content and functional relationship.

PART III

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" by S.K. Kataria & Sons, Reprint 2010.
2. Singh Bharat & Parkash Shamsher, "Soil Mechanics and Foundation Engineering", Jain Book Agency, published by K.G. Saur, 1994.

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–103 Duration of Examination : 4 Hrs
Course Title: Arts & Graphics –I Credits : 03 (L=1,T=0,U=2)

Course Contents:

- Different strokes used in pencil (2B, 4B, 6B), Charcoal pencil.
- Free hand still life sketching in pencil of various solids like cones, cubes, cylinders and spheres.
- 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. Guyr Williams, Drawing and Sketching
2. Robert W. Gill, Basic Rendering
3. Ken. Goldman, Charcoal Drawing
4. Robert W. Gill, Rendering with Pen & Ink

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–104 Duration of Examination : 4 Hrs
Course Title: Architectural Drawing–I Credits : 05 (L=1,T=0,U=4)

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 of lines, planes & solids in various positions
- Section through solids
- Isometric/ axonometric views of solid compositions and buildings

Suggested Readings:

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

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–105 Duration of Examination : 4 Hrs
Course Title: Building Construction–I Credits : 05 (L=1,T=0,U=4)

Course Contents:

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)

Dressing, laying and bonding in Stone Masonry.

a. Random Rubble
b. Coursed Rubble
c. Ashlar

Construction of brick jallis and boundary walls
Components of arches and types of Arches.
Arches in bricks and stones

a. Flat
b. Segmental
c. Semicircular

Finishing of brick and stone surfaces

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', British Library Cataloguing in Publication Data, London, 1990.
5. Barry, R., Building Construction, East West Press, New Delhi, 1999.

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–106 Duration of Examination : 6 Hrs
Course Title: Architectural Design–I Credits : 05 (L=1,T=0,U=4)

Course Contents:

Two dimensional compositions using different Colours, Textures and grades with Lines.

Two dimensional Compositions using Geometrical shapes like Rectangle, Circle, Square etc. in paper/cardboard.

Three dimensional Compositions using Geometrical forms, like cubes, cylinder, Pyramids, spheres.

Anthropometric study of Human Dimensions followed by design of various Living spaces like Drawing Room, Dining room, Bed room, Kitchen, Toilets, Study, Class room, Offices etc.

Simple Structure like Bus Shelter, Milk Bar etc.

Suggested Readings:

1. Chiara, Joseph De "Time Saver Standards for Building Types", McGraw–Hill Professional Publishing. 2001.
2. Smithies, K.W. "Principals 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.

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

Subject Code: ENL–101 Duration of Examination: 3 Hrs
Course Title: Communicative English Credits: 02 (L=2,T=0,U=0)

Objectives: To Introduce students in a graded manner to the communication skills of Reading and Writing in English. At the end of semester I, the students should be able to demonstrate adequate competence in comprehending the prescribed text and performing the given writing tasks.

Reading:

a) Developing Habits of Independent and Fast Reading.
Students will be required to read a prescribed prose anthology titled *Selections from Modern English Prose* (Ed. Haladhar Panda published by University Press, Hyderabad). The essays in the anthology will be read by students at home with the help of glossary given in the book. Progressing from one lesson to another, they should learn to read fast.
Students are supposed to keep a record of their reading in the form of notes, difficulties, summaries, outlines and reading time for each essay. Class teacher may use this record for award of internal assessment (if any).

b) Developing Comprehension Skills
Teacher will provide guided comprehension of the prescribed texts in the class and help students in answering the questions given at the end of each lesson. Teacher can construct more questions of factual and inferential nature to enhance the comprehension skills of the students. The teacher shall also guide students to do the grammar exercises given at the end of each lesson.

Writing:

a) Developing Skills in Personal Writing
Students will be required to learn short personal write–ups involving skills of description and narration. The types of composition task may include personal letter writing, telegram writing, notice writing, diary writing etc. Teacher shall instruct the students about the appropriate format and usual conventions followed in such writings. The teacher may also prescribe composition/writing book if so required.

b) Developing Writing Skills based on Guided Composition
The students will be required to write a longish composition on a question from the essays on *Selections from Modern English Prose*. The composition will require presentation of ideas beyond the prescribed essays. Sample composition topics are given at the end of each lesson.

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Question Paper: The following format is suggested for a 3–hour test.

(Appropriate choices may be given where possible)

1. Short–answer comprehension questions (at least 5) based on the lessons included in S*election from Modern English Prose* **App. weighting 30%**
2. Questions on grammar and vocabulary (words, phrases, proverbs) **App. weighting 20%**
3. Two short writing tasks of app. 100 words. One a personal letter involving narration of a personal experience or description of objects, persons, places of events. The second may be a telegram or public notice or a diary entry about a personal or family achievement, loss or celebration. **App. weighting 30%**
4. One long composition of about 300 words on one of the topics discussed in Selections from Modern English Prose. Due consideration be given to the organization of details and coherence in writing. **App. weighting 20%**

Internal Assessment: The teacher may consider the following for award of internal assessment, if any.

1. Evidence of independent reading as given above. Teacher may suggest some special tasks to suit the needs of their students.
2. Students may be asked to keep diary of their daily or specific routines.
3. Students may be asked to write a certain number of compositions on selected topics during the semester.

The division of the syllabus and the paper pattern for Minor and Major tests may be as follows:-

Minor-I

The syllabus to be covered; the essay from Sr. No. 1 to Sr. No. 6 from the prescribed book and personal letter.
Paper pattern: The following format is suggested for a test of 20 marks.
1. Personal letter (1 out of 2)
2. Short answer type question from the essay (2 out of 4).
3. Questions on Grammar and Vocabulary.

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Minor-II

The syllabus to be covered; the essay from Sr. No. 7 to Sr. No. 13 from the prescribed book and personal letter.

Paper pattern: The following format is suggested for a test of 20 marks.

1. Personal letter (1 out of 2)
2. Short answer type question from the essay (2 out of 4).
3. Questions on Grammar and Vocabulary.

Major Test

The syllabus to be covered; the essay from Sr. No. 14 to Sr. No. 20 from the prescribed book telegram and diary entry.

The format for 3 hour major test will be mentioned in the syllabus. This test will also include the syllabus covered in Minor-I and Minor-II.

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PBL121: pj`bl l`zml – I

p`T-km Eq| p`T-psqk~

Credits: 2–0–0

(I) 1. **E`qm En`qm** (sp. virE`m isG sD Eq| f`. sihdrblr isG, gr n`nk dv wnlvristl, Eimqsr) ivc| hT ilK kh`xlk`r :

(a) grmK isG ms`iPr : **gt`r**
(E) sj`n isG : **pT`x dl Dl**
(e) krq`r isG dgl : **a|cl E|fl v`ll grg`bl**
(kh`xl-s`r, ivS`-vsq, kh`xl-kl`, kh`xlk`r)

2. grmKl ErQgr`Pl dl jgq, (p|ql; mh`rnl; ibdl, itpl q EDk); ivr`m icn, Sbd jV (SD-ESD)

(II) 1. **E`qm En`qm** (sp. virE`m isG sD Eq| f`. sihdrblr isG, gr n`nk dv wnlvristl, Eimqsr) ivc| hT ilK kh`xlk`r :

(a) sqK isG Dlr : **s~Jl klD**
(E) klvq isG ivrk : **a|j`V**
(e) mihdr isG srn` : **jQ|d`r mkd isG**
(kh`xl-s`r, ivS`-vsq, kh`xl-kl`, kh`xlk`r)

2. lK rcn` (jlvnl-prk, sm`jk Eq clq iviSE~ aq):
10 lK ilKv`ax (kl`s ivc Eq Gr lel EiBE`s)

(III) 1. **E`qm En`qm** (sp. virE`m isG sD Eq| f`. sihdrblr isG, gr n`nk dv wnlvristl, Eimqsr) ivc| hT ilK kh`xlk`r :

(a) pm pk`S : **m`V` bd`**
(E) glz`r isG sD : **kl|Cx|**
(e) mhn Bf`rl : **G|tx`**
(s) virE`m isG sD : **dldl**
(kh`xl-s`r, ivS`-vsq, kh`xl-kl`, kh`xlk`r)

2. pr` pV k pSn~ d aqr dx`
(**E`qm En`qm** psqk d kh`xl B`g ivc| 15 pirE~ d EiBE`s krv`ax)

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PBL-122: ਮੁੱਢਲੀ ਪੰਜਾਬੀ

(In lieu of Punjabi Compulsory)

2–0–0

ਪਾਠ–ਕ੍ਰਮ

1. ਪੰਜਾਬੀ ਭਾਸ਼ਾ,
   ਗੁਰਮੁਖੀ ਲਿਪੀ
   ਗੁਰਮੁਖੀ ਲਿਪੀ : ਬਣਤਰ ਅਤੇ ਤਰਤੀਬ

2. ਗੁਰਮੁਖੀ ਆਰਥੋਗ੍ਰਾਫੀ
   ਸੁਰ ਬਣਤਰ ਅਤੇ ਉਚਾਰਨ
   ਵਿਅੰਜਨ ਬਣਤਰ ਅਤੇ ਉਚਾਰਨ

3. ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ
   ਸਾਧਾਰਨ ਸ਼ਬਦ
   ਇਕ ਉਚਾਰਖੰਡੀ ਸ਼ਬਦ

ਯੂਨਿਟ ਅਤੇ ਥੀਮ

1. ਪੰਜਾਬੀ ਭਾਸ਼ਾ : ਨਾਮਕਰਣ ਅਤੇ ਸੰਖੇਪ ਜਾਣ ਪਛਾਣ, ਗੁਰਮੁਖੀ ਲਿਪੀ : ਨਾਮਕਰਣ, ਗੁਰਮੁਖੀ ਵਰਣਮਾਲਾ; ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ, ਸੁਰ ਵਾਹਕ (ਓ ਅ ਏ), ਲਗਾਂ ਮਾਤਰਾਂ, ਪੈਰ ਵਿਚ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ, ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ, ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ।

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

2. ਗੁਰਮੁਖੀ ਆਰਥੋਗ੍ਰਾਫੀ ਅਤੇ ਉਚਾਰਨ; ਸੁਰਾਂ ਦੀ ਬਣਤਰ ਅਤੇ ਉਚਾਰਨ (ਲਘੂ-ਦੀਰਘ ਸੁਰ); ਸੁਰ ਅਤੇ ਲਗਾਂ ਮਾਤਰਾਂ; ਵਿਅੰਜਨਾਂ ਦੀ ਬਣਤਰ ਅਤੇ ਉਚਾਰਨ; ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣਾਂ (ਹ, ਰ, ਵ) ਦਾ ਉਚਾਰਨ ; ਲ ਅਤੇ ਲ਼ ਦਾ ਉਚਾਰਨ; ਭ, ਧ, ਢ, ਝ, ਘ ਦਾ ਉਚਾਰਨ; ਪੈਰ ਵਿਚ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣਾਂ ਦਾ ਉਚਾਰਨ।

3. ਪੰਜਾਬੀ ਸ਼ਬਦ-ਬਣਤਰ : ਸਾਧਾਰਨ ਸ਼ਬਦ; ਇਕੱਲਾ ਸੁਰ (ਜਿਵੇਂ ਆ); ਸੁਰ ਅਤੇ ਵਿਅੰਜਨ (ਜਿਵੇਂ ਆਰ); ਵਿਅੰਜਨ ਅਤੇ ਸੁਰ (ਜਿਵੇਂ ਪਾ); ਵਿਅੰਜਨ ਸੁਰ ਵਿਅੰਜਨ (ਜਿਵੇਂ ਪਾਰ); ਕੋਸ਼ਗਤ ਸ਼ਬਦ (ਜਿਵੇਂ ਘਰ, ਪੀ); ਵਿਆਕਰਣਕ ਸ਼ਬਦ (ਜਿਵੇਂ ਨੂੰ, ਨੇ); ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ–1; ਲਿੰਗ-ਪੁਲਿੰਗ, ਇਕ ਵਚਨ-ਬਹੁ ਵਚਨ; ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ–1: ਖਾਣ-ਪੀਣ, ਸਾਕਾਦਾਰੀ, ਰੁੱਤਾਂ, ਮਹੀਨਿਆਂ, ਗਿਣਤੀ, ਮੌਸਮ ਆਦਿ ਨਾਲ ਸੰਬੰਧਿਤ।

B.ARCHITECTURE (SEMESTER – II)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–151 Duration of Examination: 3 Hrs
Course Title: Theory of Structures –II 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.

PART II

Design of retaining walls in masonry; loads, resultant pressure, conditions for stability of structure, middle third rule, design examples. Introduction to various components of truss, calculation of loads (Dead load, live load and wind load) on truss members and design examples.

PART III

Earthquake zones of India**,** Damage caused by earthquake to masonry structures, Effects of mass and height, lateral-stiffness, Importance of ductility, Importance of integrity, Geometric configuration and Essentials of seismic design of masonry buildings.

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. Kumar, Sushil, "Design of R.C.C. Structures: Name of Publishers", New Age International (P) Limited , 2005.

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

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:

PART I

Elementary elements of a building; their functions and characteristics

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.

Bricks: 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; Manufacture of brick in brief.

PART II

Stone: Sources; Choice and uses of stone; Characteristics of good stone; Tests for stones; Preservation; Destroying agents; Stone quarrying, dressing and polishing; Artificial Stone;

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; Manufacture in brief.

PART-III

Concrete: Properties; Uses; Material used 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

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, India, 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., 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

B.ARCHITECTURE (SEMESTER – II)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–153 Duration of Examination : 3 Hrs
Course Title: History of Architecture–I Credits : 03 (L=2,T=1,U=0)

Course Contents

PART I

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.

PART II

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)

PART III

Genesis of Hindu Architecture during the Gupta & the Chalukyan period

Development of Dravidian Architecture through different phases: Pallavas, Cholas, Pandyas, Vijainagar & Madura

Indo–Aryan Architecture: Orissa, Khajuraho & Gujarat

Jain Architecture

Suggested Readings:

1. Fletcher, B.– History of Architecture CBS Publishers & Distributors, Delhi (1986)
2. Brown, P.– Indian Architecture (Buddhist and Hindu Periods), DB Taraporevala Sons & Co. Private Ltd., Bombay (1971).
3. Grover, S.– Buddhist and Hindu Architecture in India, CBS Publishers & Distributors, Delhi (2003).
4. Tadgel, C.– The History of Architecture in India, Architecture Design & Technology Press, London (1990).
5. Acharya, P.K.– Hindu Architecture in India and Abroad, Oriental, New Delhi, (1979).

B.ARCHITECTURE (SEMESTER – II)
(Under Credit Based Continuous Evaluation Grading System)

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

Course Contents:

Preparation of Colour wheel in Poster Colours. Use and application of colour wheel

Outdoor free hand sketching of trees, shrubs, simple buildings, human figures,automobiles etc. in color (Water Colors, Pencil Colours and Poster Colours).

Rendering of various scenes (small structures) such as Milk bar, Bus Stop, Cafeteria, Petrol filling station etc. in Pen & Ink, Water Colour and mix media.

Suggested Readings:

1. Oliver, Robert S., Sketch in Color
2. Suffudy, Sketching Techniques
3. Smith, Ray, Water Color Landscape
4. Kasprisin, Ronald J., Water Color in Architecture
5. Chen, S.M., Architecture in Pen & Ink

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

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

Course Contents:

Carpentry

– Measuring, cutting, 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.
2. Knoll, Wolfgang & Hechinger, Martin, Architectural Models.
3. Watson, Don A., Construction Materials and Processes, McGraw Hill Co., 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, Anand, 1997.

B.ARCHITECTURE (SEMESTER – II)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–156 Duration of Examination: 4 Hrs
Course Title: Building Construction–II Credits : 05 (L=1,T=0,U=4)

Course Contents:

Foundations of walls and columns in stone and brick masonry.

Damp proof courses of internal and external walls.

Simple joints used in joinery of doors and windows.

Introduction to hardware used in doors and windows.

Various types of timber windows:

a. Casement with ventilators
b. Wire mesh
c. Clerestory
d. Bay
e. Fixed, side and top hung, pivoted, louvered

Various types of timber doors

- Ledged, battened and braced.
- Panel and Wire mesh
- Flush
- Glazed

Details of lintel, Chhajja and sills in concrete, brick and stone.

Flat slab construction of RCC/RBC roof slab incorporated terrace details.

Suggested Readings:

1. Don A. Watson, 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', British Library Cataloguing in Publication Data, London, 1990.
5. Barry, R, Building Construction, East West Press, New Delhi, 1999.

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–157 Duration of Examination : 6 Hrs
Course Title: Architectural Design–II Credits : 05 (L=1,T=0,U=4)

Course Contents:

Memorial, Gateway etc.

Small structures like Enquiry Booth, Extension counter like ATM, etc.

Snack Bar, Petrol Pump, Police Assistance Booth, Rural Dispensary, Suvidha Kendra,etc.

Small single storied dwelling units like Studio Apartment, Tourist cottage, etc.

Suggested Readings:

1. Smithies, K.W. “Principals of Design in Architecture”, Chapman & Hall, 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.

B.ARCHITECTURE (SEMESTER – II)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ENL–151 Duration of Examination : 3 Hrs
Course Title: Communicative English Credits : 02 (L=2,T=0,U=0)

Objectives: To Introduce students in a graded manner to the communication skills of Reading and Writing in English. At the end of semester II, the students should be able to demonstrate adequate competence in comprehending an unseen passage and performing the prescribed communication/writing tasks.

Prescribed Book: Vandana R. Singh, The Written Word, Oxford University Press, New Delhi (Selected Chapters).

Reading:

a) Developing Comprehension Skills

Students will be required to read sample comprehension passage as given in Chapter *Critical Reading and Comprehension* of the prescribed book. The teacher will help students in handling text and answering questions given at the end of each passage.

Teacher can bring in more texts and construct questions of factual and inferential nature to enhance the comprehension skills of the students.

b) Developing Habits of Additional Reading

The students will be required to show evidence of additional independent reading. They will maintain a scrapbook consisting of such readings as clippings from newspapers and magazines, short articles, stories etc. The minimum quantum of such additional reading will be decided by the class teacher, who will also test students individually on their additional reading (and appropriately award internal assessment, if required.

Writing:

a) Developing Vocabulary and using it in the Right Context

Students will be required to pay special attention to build up their vocabulary. They should master the contents of the chapter on *Vocabulary* in the prescribed book. Teacher will help the students learn the correct and appropriate use of the given set of words/phrases/expressions.

b) Developing Skills in Formal Writing

Students will be required to do write–ups involving skills of making formal complaints, requests, orders etc., reporting, note taking, summarizing and transcoding. The types of composition task may include business and public interest letters, news/features writing, speeches, minutes, instructions, summary reports etc. Teacher shall instruct the students about the appropriate format and usual conventions followed in such writings. The following chapters in the prescribed book may be consulted for exercise materials on these tasks:

1. Paragraph and essay writing
2. Report Writing
3. Letter Writig
4. Note Making and Summarizing
5. Transcoding

Recommended Books:

1. A Course in Grammar and Composition by Geeta Nagaraj, Foundation Book, 2006.

2. Oxford Guide to Effective Writing and Speaking by Jhon Seely.

B.ARCHITECTURE (SEMESTER – II)
(Under Credit Based Continuous Evaluation Grading System)

PBL-131: ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ–II

p`T-km Eq p`T psqk~

Credits: 2-0-0

(I) 1. **E`qm En`qm** (sp. virE`m isG sD Eq f`. sihdrblr isG, gr n`nk dv wnlvristl, Eimqsr) ivcl hT~ ilK kvl :

(a) B`el vlr isG
(E) p: prn isG
(e) p: mhn isG
(kivq`-s`r, ivS`–vsq, k`iv-kl`, kvl)

2. pj`bl Sbd bxqr : D`q/ml, vDqr (Egqr, ipCqr, ivalqpq Eq rp~qrl), sm`s |

(II) 1. **E`qm En`qm (**sp. virE`m isG sD Eq f`. sihdrblr isG, gr n`nk dv wnlvristl, Eimqsr) ivcl hT ilK kvl :

(a) Eimq` plqm
(E) f`. hrBjn isG
(e) iSv km`r bt`lvl
(kivq`-s`r, ivS`-vsq, k`iv-kl`, kvl)

2. **plr`l rcn` :** kl`s ivc 10 iviSE~ (siBE`c`rk, D`rimk Eq r`jnlqk) q pr` rcn` d EiBE`s krv`ax |

(III) 1. **E`qm En`qm (**sp. virE`m isG sD Eq f`. sihdrblr isG, gr n`nk dv wnlvristl, Eimqsr) ivcl hT ilK kvl :

(a) f`. jsvq isG nkl
(E) f`. jgq`r
(e) f`. srjlq p`qr
(s) p`S
(kivq`-s`r, ivS`-vsq, k`iv-kl`, kvl)

2. mh`vr q EK`x (EK`x q mh`vr` kS ivc) 200 mh`virE~ Eq 100 EK`x~ nl v`k~ ivc vrqx d EiBE`s krv`ax (kl`s ivc q Gr lel) |

B.ARCHITECTURE (SEMESTER – I)
(Under Credit Based Continuous Evaluation Grading System)

PBL-132: ਮੁੱਢਲੀ ਪੰਜਾਬੀ

(In lieu of Punjabi Compulsory)

2–0–0

ਪਾਠ–ਕ੍ਰਮ

1. ਪੰਜਾਬੀ ਸ਼ਬਦ–ਬਣਤਰ
   ਸੰਯੁਕਤ ਅਤੇ ਮਿਸ਼ਰਤ ਸ਼ਬਦ
   ਬਹੁ–ਉਚਾਰਖੰਡੀ ਸ਼ਬਦ

2. ਪੰਜਾਬੀ ਵਾਕ–ਬਣਤਰ
   ਸਾਧਾਰਨ–ਵਾਕ : ਕਿਸਮਾਂ
   ਸੰਯੁਕਤ–ਵਾਕ : ਕਿਸਮਾਂ
   ਮਿਸ਼ਰਤ–ਵਾਕ : ਕਿਸਮਾਂ

3. ਪ੍ਰਕਾਰਜੀ ਪੰਜਾਬੀ
   ਚਿੱਠੀ ਪੱਤਰ
   ਪੈਰ੍ਹਾ ਰਚਨਾ
   ਸੰਖੇਪ ਰਚਨਾ
   ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰੇ

ਯੂਨਿਟ ਅਤੇ ਥੀਮ

1. ਪੰਜਾਬੀ ਸ਼ਬਦ-ਬਣਤਰ : ਸੰਯੁਕਤ ਸ਼ਬਦ; ਸਮਾਸੀ ਸ਼ਬਦ (ਜਿਵੇਂ ਲੋਕ ਸਭਾ); ਦੋਜਾਤੀ ਸ਼ਬਦ (ਜਿਵੇਂ ਕਾਲਾ ਸਿਆਹ); ਦੋਹਰੇ ਸ਼ਬਦ/ਦੁਹਰਰੁਕਤੀ (ਜਿਵੇਂ ਧੂੜ ਧਾੜ੍ਹ/ਭਰ ਭਰ), ਮਿਸ਼ਰਤ ਸ਼ਬਦਾਂ ਦੀ ਬਣਤਰ/ਸਿਰਜਨਾ; ਅਗੇਤਰਾਂ ਰਾਹੀਂ (ਜਿਵੇਂ ਉਪ ਭਾਸ਼ਾ), ਪਿਛੇਤਰਾਂ ਰਾਹੀਂ (ਜਿਵੇਂ ਰੰਗਲਾ), ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ–2: ਪੜਨਾਵੀਂ ਰੂਪ, ਕਿਰਿਆ/ਸਹਾਇਕ ਕਿਰਿਆ ਦੇ ਰੂਪ; ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ–2: ਮਾਰਕੀਟ/ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਧੰਦਿਆਂ ਨਾਲ ਸੰਬੰਧਿਤ।

2. ਪੰਜਾਬੀ ਵਾਕ-ਬਣਤਰ : ਕਰਤਾ ਕਰਮ ਕਿਰਿਆ; ਸਾਧਾਰਨ ਵਾਕ, ਬਿਆਨੀਆ, ਪ੍ਰਸ਼ਨਵਾਚਕ, ਆਗਿਆਵਾਚਕ, ਸੰਯੁਕਤ ਅਤੇ ਮਿਸ਼ਰਤ ਵਾਕਾਂ ਦੀਆਂ ਕਿਸਮਾਂ; ਸੁਤੰਤਰ ਅਤੇ ਅਧੀਨ ਉਪਵਾਕ; ਸਮਾਨ (ਤੇ/ਅਤੇ) ਅਤੇ ਅਧੀਨ (ਜੋ/ਕਿ) ਯੋਜਕਾਂ ਦੀ ਵਰਤੋਂ; ਪੰਜਾਬੀ ਵਾਕਾਂ ਦੀ ਵਰਤੋਂ : ਵਿਭਿੰਨ ਸਮਾਜਕ/ਸਭਿਆਚਾਰਕ ਪ੍ਰਸਥਿਤੀਆਂ ਦੇ ਅੰਤਰਗਤ; ਘਰ ਵਿਚ, ਬਾਜ਼ਾਰ ਵਿਚ, ਮੇਲੇ ਵਿਚ, ਸ਼ੋਪਿੰਗ ਮਾਲ/ਸਿਨਮੇ ਵਿਚ, ਵਿਆਹ ਵਿਚ, ਧਾਰਮਿਕ ਸਥਾਨਾਂ ਵਿਚ, ਦੋਸਤਾਂ ਨਾਲ ਆਦਿ।

3. ਇਸ ਯੂਨਿਟ ਵਿਚ ਚਿੱਠੀ ਪੱਤਰ (ਨਿੱਜੀ/ਦਫ਼ਤਰੀ/ਵਪਾਰਕ), ਪੈਰਾ ਰਚਨਾਂ, ਸੰਖੇਪ ਰਚਨਾ ਅਤੇ ਅਖਾਣ ਮੁਹਾਵਰਿਆਂ ਦੀ ਵਰਤੋਂ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀ ਦੀ ਭਾਸ਼ਾਈ ਯੋਗਤਾ ਨੂੰ ਪਰਖਿਆ ਜਾਵੇਗਾ।

B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–201 Duration of Examination= 3 Hours
Course Title: Theory of Structures –III Credits: 03 (L=2,T=1,U=0)

Course Contents:

PART I

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.
Design of singly reinforced beams, doubly reinforced beams, cantilever beams; depth thickness of section, area of reinforcement steel, shear check, shear reinforcement, deflection length check, design examples Introduction to T beams and L beams. Effect of continuity of beams

PART II

Introduction to various types of slabs and 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 456:2000 codal provisions, various checks and design examples. Effects of continuity of slabs.

PART III

Design of columns; long and short columns, basic equation of design IS 456 code provisions, section of column, longitudinal and lateral reinforcement. Types of footings, Design of isolated square and rectangular 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. Jain, A.K., Reinforced Concrete – Limit State Design Publishing Tata McGraw–Hill .
2. Sinha, S.N., Reinforced Concrete Design. Tata McGraw– Hill Publishing Company, New Delhi
3. Dayaratnam, P., Reinforced Concrete Design. Oxford & IBH Publishing Company.
4. Ramamurthan, Design of RCC Structures. Publisher: Dhanpat Rai (2011).
5. Ramchandra, Design of Concrete Structures. Publisher: Scientific Publishers Journals Dept.
6. Gambir, M.L., Design of Reinforced Concrete Structures – PHI Learning Pvt Ltd. (2010)

B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–202 Duration of Examination 3 Hrs
Course Title: Building Science–III (Climatology) Credits : 03 (L=2,T=1,U=0)

Course Contents:

PART I

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.

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,

PART II

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.

PART III

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. Konniesberger, ed., Manual of Tropical Housing. Longman Group. U.K. 2000.
2. Olgay,V. Design with Climate.
3. Martin Ewans, Climatology. MN: Lerner Publications Company, 1971
4. Krishan, Arvind. Climate Responsive Architecture. Tata Mc Graw Hill, New Delhi.
5. Lal., D.S. Climatology, Sharda Pustak Bhawan, Allahabad, 2001.

B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–203 Duration of Examination 3 Hrs
Course Title: Theory of Design –I Credits : 03 (L=2,T=1,U=0)

Course contents:

PART I

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,

PART II

Introduction to Form, Function and Circulation. Interrelationship of Form, Function and circulation in Architectural design. Organization of form & space, Mass space relationship.

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

PART III

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.

Building types–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 Mostorand Reihocd, NY, 1996.

2. Smith, C. Ray, Interior Design in the 20th Century. Harpercollins College Div.

3. Bunce, Fredrick W., The Iconography of Architectural Plans. D.K. Print World.

4. Rompilla, Ethel, Color for Inferior Design, Harry M. Abrams. Inc. Publisher, 2005.

B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–204 Duration of Examination 4 Hrs
Course Title: Arts and Graphics–III Credits : 03 (L=1,T=0,U=2)

Course Contents:
Rendering of Plans, Elevation, Sections, Site Plans, Perspective, Sectional perspective with to various rendering techniques.

Pen and ink
Water color/ Poster colors
Color pencil
Oil Pastels
Photomontage technique

Art orientation exercise in different media for making

Murals
Motifs
Collages

Sculptures:

Steel, Bronze, Iron, Plaster of Paris and Clay
Sculptures

Suggested Readings:

1. Wang, Thomas C. Pencil Sketching, John Wiley & Sons Inc., 2001.
2. Ching, Francis D.K. Architectural Graphics (5th Edition), John Wiley & Sons, 2009.
3. Ramsey, Charles George, Harold Reeve Sleeper, Bruce Bassler, Architectural Graphic Standards: Student Edition, John Wiley & Sons, 2008.
4. Albert, Greg & Wolf, Rachel Rubin, Basic Watercolor Techniques (Art instruction), North Light Books, 1991.
5. Kliment, Stephen, Architectural Sketching and Rendering: Techniques for Designers and Artists, Watson Guptil Publications, NY. 1984.
6. Drpic, Ivo, Sketching and Rendering of Interior Spaces, Watson Guptil Publications, NY, 1988.
7. McGarry, Richard & Madsen, Greg, Marker Magic– Problem Solver for Designers, John Wiley & Sons, 1993.
8. Gill W Robert, The Thames and Hudson Manual of Rendering With Pen & Ink, WW Norton and Co. Inc, 1990.

B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–205 Duration of Examination 4 Hrs
Course Title: Architectural Drawing–II Credits : 05 (L=1,T=0,U=4)

Course Contents:

I) 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

II) 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
- Sciography applied on the perspectives of the buildings

Suggested Readings:

1. D'Amelio, Joseph. Perspective Drawing Handbook. Dover Publications. 2004.
2. Smith, Ray. Introduction to Perspective. Dorling Kindersley Publishers Ltd. 1999.
3. Warren, P.E. & Luzadder, J. Fundamentals of Engineering Drawing.
4. Wyatt, William E. General Architectural Drawing. Chas. A. Bennett Co., Inc. 1969.
5. Bhatt, N.D. Engineering Drawing. Charotar; Tenth Edition. 1996.

B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–206 Duration of Examination 4 Hrs
Course Title: Building Construction –III Credits : 05 (L=1,T=0,U=4)

Course Contents:

Various type of floors and floor finishes.

Various types of wall construction

- Cavity wall
- Hollow block wall
- Dhajji wall
- Concrete block wall
- Mud block wall

Different types of staircase and their various construction techniques

Staircase:

- Dog legged
- Open well
- Spiral
- Helical
- Cantilever

Construction Techniques:

- Waist slab
- Folded slab
- Central beam

Section through a double storied building incorporating the above details.

Suggested Readings:

1. Bindra, S.P & Arora, S.P. Text Book on Building Construction
2. Watson, Don A. Construction Materials and Processes, McGraw 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.

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B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–207 Duration of Examination: 12 Hrs
Course Title: Architectural Design–III Credits: 07 (L=2,T=0,U=5)

Course Contents:

Residential building with small work area like Artist's Cottage, Architect's Residence, Farm House etc.

Residential complex like Guest House, Hostel, Inn etc.

Design of a house for physically challenged as per norms of the barrier–free environment.

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.

B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

ESL220: Environmental Studies (Compulsory)

Credit: 3–0–0

1. **The multidisciplinary nature of environmental studies:** Definition, scope & its importance, Need for public awareness.

2. **Natural resources**: Natural resources and associated problems.

   a) **Forest resources**: Use of 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, change caused by agriculture and overgrazing, effects or modern agriculture, fertilizer-pesticide problem, salinity, case studies.

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

   f) **Land recourses**: Land as a resource, land degradation, soil erosion and desertification.

   g) Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyles.

3. **Ecosystem:**
   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 ecosystems:
   a. Forest ecosystem
   b. Grassland ecosystem
   c. Desert ecosystem
   d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

B.ARCHITECTURE (SEMESTER – III)
(Under Credit Based Continuous Evaluation Grading System)

4. Biodiversity and its Conservation:

Definition: Genetic, species and ecosystem diversity, Biogeographical classification of India.
Value of Biodiversity: Consumptive use; productive use, social, ethical, aesthetic and option values.
Biodiversity of global, National and local levels, India as mega-diversity nation "Hot-spots of biodiversity.
Threats to Biodiversity: Habitat loss, poaching of wild life, man wildlife conflicts Endangered and endemic species of India.
Conservation of Biodiversity: In situ and Ex-situ conservation of biodiversity.

5. Environmental Pollution:

Definition, Causes, effects and control measures of:
a) Air Pollution
b) Water Pollution
c) Soil Pollution
d) Marine Pollution
e) Noise Pollution
f) Thermal Pollution
g) Nuclear Hazards

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

6. Social Issues and Environment:

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

7. Human population and the environment

* Population growth, variation among nations
* Population explosion-Family welfare programme
* 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

*** Road Safety Rules & Regulations:** Use of Safety Devices while Driving, Do's and Don'ts while Driving, Role of Citizens or Public Participation, Responsibilities of Public under Motor Vehicle Act, 1988, General Traffic Signs

*** Accident & First Aid:** First Aid to Road Accident Victims, Calling Patrolling Police & Ambulance

8. 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. Agarwal, K. C. 2001. Environmental Biology, Nidhi Publications Ltd. Bikaner.
2. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
3. Bharucha, E. 2004. The Biodiversity of India, Mapin Publishing Pvt. Ltd. Ahmedabad.
4. Brunner, R. C. 1989. Hazardous Waste Incineration, McGraw Hill Inc. New York.
5. Clark, R. S. 2000. Marine Pollution, Clanderson Press Oxford.
6. Cunningham, W. P., Cooper, T. H., Gorhani, E. & Hepworth, M. T. 2001. Environmental Encyclopedia, Jaico Publications House, Mumbai.
7. De, A. K. 1989. Environmental Chemistry, Wiley Eastern Ltd.
8. Down to Earth, Centre for Science and Environment, New Delhi.
9. Hawkins, R. E. 2000. Encyclopedia of Indian Natural History, Bombay Natural History Society.
10. Heywood, V. H & Waston, R. T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.
11. Jadhav, H. & Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub.

12. Joseph, K. and Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
13. Kaushik, A. & Kaushik, C. P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
14. Miller, T. G. Jr. 2000. Environmental Science, Wadsworth Publishing Co.
15. Odum, E. P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA.
16. Rajagopalan, R. 2005. Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.
17. Sharma, B. K. 2001. Environmental Chemistry. Geol Publishing House, Meerut.
18. Sharma, J. P. 2004. Comprehensive Environmental Studies, Laxmi Publications (P) Ltd, New Delhi.
19. Sharma, P. D. 2005. Ecology and Environment, Rastogi Publications, Meerut.
20. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House, New Delhi.
21. Survey of the Environment. 2005. The Hindu.
22. Tiwari, S. C. 2003. Concepts of Modern Ecology, Bishen Singh Mahendra Pal Singh, Dehra Dun.
23. Townsend, C., Harper, J. and Michael, B. 2001. Essentials of Ecology, Blackwell Science.
24. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex, Amritsar.

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation Grading System)

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

Course Contents:

PART I

Riveted and bolted connections; different types of bolts, advantages and disadvantages of bolted connections, types of bolted joints, various failures of bolted joint, calculation of efficiency of bolted joint Welded connections different types of welds, advantages and disadvantages including, design of welded joints.

PART II

Design and behavior of compression members subjects to axial loading, effective length, radius of gyration, slenderness ratio, permissible stresses, design examples. Design strength of tension members. Design strength due to yielding of gross cross-section, due to rupture of critical section and due to block shear. Design examples. Design and behavior of steel truss members for given loading; compressive force and tensile force, reversal of forces.

PART III

Design and behavior of steel beams, classifications of cross-sections as per IS 800:2007; Design procedure, web buckling, web crippling, shear check, deflection check and design examples. Design of column bases; slab base, gusset base and design examples. Introduction of grillage foundation for isolated steel column.

Suggested Readings:

1. Ramamurthan, S. Design of Steel Structures. Year of Publication: 2010 Edition: 7th Revised Jain Book.
2. Bhavikatti, S.S. Design of Steel Structures by Limit State Method of Design, I.K. International Publishing House Pvt. Ltd. 2010.
3. Sheykar, M.R. Limit State Design in Strucrural Steel, PHI Learning Pvt. Ltd. 2010.
4. Chandra, Ram, Design of Steel Structures. Standard Books, 1970.
5. Dayratnam, P., Design of Steel Structures. S. Chand, 2008.
6. Arya and Ajmani, Design of Steel Structures. Nem Chand, 1974.
7. Duggal, Design of Steel Structures, Tata Magra Hill 2009.

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation 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)

Course Contents:

PART I

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

PART II

Fundamentals of sound – terminology, Principals of transmission and passage of sound. Factors influencing hearing conditions– Shapes, layouts, Sitting arrangements of Auditoriums, Lecture Halls, Multipurpose halls, Reverbration, reflection and absorption of sound Reverbration time, Accoustical defects– Echo, Dead spot, sound foci, etc.

PART III

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, 2001.
2. Bindra – Arora, Building Construction. National Book Trust, India, 1986.
3. Punmia, B.C. Building Construction. Published by Laxmi Publication.
4. Konniesberger, ed., Manual of Tropical Housing. Longman Group. U.K. 2000.

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation Grading System)

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

Course Contents:

PART I

Early Christian Architecture and Byzantine Architecture

Development of Romanesque Architecture in Italy,

Romanesque Architecture in Central Europe

Romanesque Architecture in France

PART II

Development of Gothic Architecture in France.

Gothic Architecture in Great Britain.

Gothic Architecture in Italy.

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

PART III

Development of Baroque Architecture in Italy.

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, 1977.

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–254 **Duration of Examination 4 Hrs**
Course Title: Arts and Graphics IV **Credits : 03 (L=1,T=0,U=2)**

Course Contents:

PART I

Rendering in 2D and 3D, using manual techniques such as pencil shading, colouring, etc. and software's such as Photoshop and Google Sketch–up. Sketching in different modes like, natural, sepia, monochrome etc.

Photography in Architecture

Basic know–how about Art of Photography in History, its development and use of Cameras. View angles and station point selection for photography in Interior scopes, Exterior scopes, and Landscapes. Application of Perspective angles to be set while designing a Space.

Architectural Design presentation techniques. Layouts, details, composition of images over the layouts

PART II

Art consciousness, Aesthetics perception, symbolism, expression, style, fashion, appropriateness and values. Critical appraisal of examples from the visual as well as performing arts

Suggested Readings:

1. Thomas C Wang, Pencil Sketching, John Wiley & Sons Inc., 2001.
2. Francis DK Ching, Architectural Graphics (5th Edition), John Wiley & Sons, 2009.
3. Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler, Architectural Graphic Standards: Student Edition, John Wiley & Sons, 2008.
4. Greg Albert , Rachel Rubin Wolf, Basic Watercolor Techniques (Art Instruction), North Light Books, 1991.
5. Architectural Sketching and Rendering: Techniques for Designers and Artists by Stephen Kliment, Watson Guptil Publications, NY. 1984.
6. Sketching and Rendering of Interior Spaces by Ivo Drpic, Watson Guptil Publications, NY, 1988.
7. Marker Magic– Problem Solver for Designers by Richard McGarry and Greg Madsen, John Wiley & Sons, 1993.
8. Gill W Robert, The Thames and Hudson Manual of Rendering with Pen & Ink, WW Norton and Co. Inc, 1990.

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–255 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 tabling.

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

LEVELLING

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

Suggested Readings:

1. Punmia, B.C. “Surveying and Levelling” by Laxmi Publication.
2. Kanitkar, “Surveying” by ISBN 817371021X .
3. Duggal, S.K. “Text Book of Surveying” Published by Tata McGraw–Hill Ninth Reprint 2008.
4. 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.
5. Arora, K.R. “Principles & Use of Surveying Instruments”

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–256 Duration of Examination 4 Hrs
Course Title: Building Construction–IV Credits : 05 (L=1,T=0,U=4)

Course Contents:

Introduction to the various types of pitched roofs and their terminology.

Various type of steel trusses and roof coverings

Steel trusses	**Roof coverings**
– Flat	– A.C. Sheets
– Bow string	– G.I. sheets
– North light or saw tooth	– Fiberglass

1. Waterproofing of roofs, walls and basements (Materials & Techniques)
2. Expansion joints in buildings
3. Temporary supporting structures
   a. Form work/shuttering (Pneumatic)
   b. Scaffolding
   c. Shoring & underpinning
4. Various type of wall cladding
   a. Glass wall with patch fittings
   b. Aluminum Composite panels
   c. Stone (Red sand stone/slates/granite/marble)
   d. 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.

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–257 Duration of Examination 12 Hrs
Course Title: Architectural Design–IV Credits : 07 (L=2,T=0,U=5)

Course Contents

- Village Study
- Walkup apartments 3 Storeyed
- Residential School, Small Institute, Tourist Resort, etc

Suggested Readings

1. Unterman, Richard & Robert, Small. “Site Planning for Cluster Housing”, Van Nostrand Reinhold, 1977.
2. Chiara, Joseph De “Time Saver Standards for Building Types” McGraw–Hill Professional Publishing. 2001.
3. Neufert, Ernst, “Architect’s Data” 3rd Edition, Wiley–Blackwell. 2002.

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–258 Duration of Examination : Viva Voce
Course Title: Computer Application Credits : 02 (L=2,T=0,U=0)

Course Contents:

PART I

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

PART II

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.

PART III

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

Rendering of isometric views using various rendering commands

Use of layouts, concepts of x–ref, Preparation of rendered 3–D drawing projects

Suggested Readings:

1. Goldenberg, Joseph, "AutoCAD Architecture 2008 – Comprehensive Tutorial" Audodesk, 2008.
2. Aubin, Paul F, "Mastering Auto CAD Architecture" 2008.
3. Elise, Moss, "AutoCAD Architecture 2008 Fundamentals" Autodesk 2008.

B.ARCHITECTURE (SEMESTER – IV)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARF–259 Duration of Examination: Viva Voce
Course Title: Project Oriented Study Tour Credits: 02 (L=0, T=0, U=0)

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. The tour shall be of one to two weeks of duration.

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, who accompanied the tour, as part of the internal assessment.

B.ARCHITECTURE (SEMESTER – V)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–301 Duration of Examination 3 Hrs
Course Title: Structure Systems Credits : 03 (L=2,T=01,U=0)

Course-contents:

PART I

Bulk Active Structure System:
Concept, development, laws of formation, Spans, Examples, merits and demerits, Slabs (one way and two way, Flat slab, Waffle slab), Beams (Simply supported, Cantilever, Continuous, Vierendeel Girders), Grid (skew and square).

Form Active Structure System
Concept development, laws of formation, Spans, Examples, merits and demerits, Funicular structures (Cables and Arches), Tents, Pneumatic structures

PART II

Vector Active Structure System
Concepts, development, laws of formation, Spans, Examples, Merits and demerits, Trusses, Space frames, Geodesic Dome.
Surface Active Structure System:
Singly curved shells, Doubly curved shells, Hyperbolic paraboloids, Folded plates

PART III

Multi–Storeyed Buildings
Introduction, Load action on High rise building, various structural systems.

Foundations
Introduction to various types of Foundations

Suggested Readings:

1. Dayarathnam, P. Pre-stressed Concrete Structures, Oxford and IBM Publishing Co., New Delhi, 1982.
2. Schueller, Wolfgang. High Rise Building Structures, John Wiley & Sons., New York, 1976.
3. Otto, Frei. Editor – Tensile Structures, Volume I, Pneumatic Structures, Vol., 2, Cable Structures. The MIT Press, London.
4. Subramaniam, N. Principles of Space Structures, Wheeler & Co., Allahabad, 1983.
5. Schodek, Daniel. Structures, Prentice Hall of India, New Delhi, 2004.
6. Engel, Heino. Structures System.

B.ARCHITECTURE (SEMESTER – V)
(Under Credit Based Continuous Evaluation Grading System)

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

Course Contents

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., (1992); "Water Supply and Sanitary Engineering," Dhanpat Rai & Sons, 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, 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.

B.ARCHITECTURE (SEMESTER – V)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–303 Duration of Examination: 3 Hrs
Course Title: Theory of Design-II Credits : 03 (L=2,T=01,U=0)

Course Contents:

PART–I

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–II

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

B.ARCHITECTURE (SEMESTER – V)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–304 Duration of Examination 3 Hrs
Course Title: Estimating, Costing & Building Specifications 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 specifications 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 materials. Uses of standard specifications drafted by CPWD, PWD etc.

PART II

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.
Writing detailed specification for various construction works like earthwork for foundations, Brickwork, R.B. work, R.C.C. work, plastering and pointing, various types of flooring, white washing, distempering and painting, roof terracing, stone masonry.

PART III

Estimates, types of estimate approximate and detailed methods of approximate estimating, plinth area methods, carpet floor area method, cubic content methods, approximate content method and number system. 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 foundation, flooring. Introduction to P.W.D accounts procedure as per Common Schedule of Rates.

Suggested Readings:

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

B.ARCHITECTURE (SEMESTER – V)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–305 Duration of Examination 4 Hrs
Course Title: Building Construction – V Credits : 05 (L=1,T=0,U=4)

Course Contents

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

Partitions (glass bricks, wooden, board), Paneling (board, fiber–sheet, polycarbonate sheet) and false ceiling (gypsum board, Pop, aluminum section, plywood, canvas)

Introduction to partitions for large span structures e.g. convention centre

Cupboards, cabinets, counters and showcase/Display windows

Construction details of an interior like office, showroom, etc. incorporating the above details.

B.ARCHITECTURE (SEMESTER – V)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–306 Duration of Examination Viva Voce
Course Title: Architectural Design–V Credits : 10 (L=2,T=0,U=08)

Course Contents:

Institute building

Cultural complex – Museum, Art Gallery and Exhibition, Cultural Centre/ Convention Centre etc.

Public buildings – Administrative complex, Judicial complex, Office building 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, 2002.
3. Mimi, Zeiger, "New Museum Architecture: Innovative Buildings from Around the World", Thames and Hudson, 2005.

B.ARCHITECTURE (SEMESTER – VI)
(Under Credit Based Continuous Evaluation 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.

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.

PART–III

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.

B.ARCHITECTURE (SEMESTER – VI)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–352 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.
4. Tadgell, Christopher, The History of Architecture in India, Phadion Press Limited. 2002.
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.

B.ARCHITECTURE (SEMESTER – VI)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–353 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. Ingels, Jack E. “Landscaping: Principles and Practice”, Publishers Delmar Cengage Learning, USA.
2. Laurie, Michael. “An Introduction to Landscape Architecture”, American Elsevier Publishing Co., USA.
3. Randhawa, M.S. “Flowering Trees”, Indian Council of Agricultural Research, India.
4. Stuart V.C.M. “Gardens of the Great Mughals”, Cosmo Publishers, London, UK.
5. Geoffrey and Susan Jellico: “The Landscape of Man”, Van Nostrand Reinhold, USA.

B.ARCHITECTURE (SEMESTER – VI)
(Under Credit Based Continuous Evaluation 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/ dimension s at all floor levels.
- Terrace plan
- Elevations/ Sections
- Joinery Details
- Toilet Details
- Kitchen Details
- Staircase Details
- Electrical Plan
- Plumbing/ sanitary layout

Appraisals of Commercial Kitchens in Hotels/ Hostels etc.

Case studies/ detailing of Public Toilets

Suggested Readings:

1. Watson, Don A. Construction Materials and Processes, McGraw Hill Co., 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.

B.ARCHITECTURE (SEMESTER – VI)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–355 Examination: Viva voce
Course Title: Architectural Design–VI Credits : 10 (L=2,T=0,U=08)

Course Contents:

Major problems shall consist of I.T. Park/Shopping Mall

200 bedded hospital/factory

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. 2002.
3. Geraint John & Rod Sheard, "Stadia, A Design and Development Guide", Architectural Press, 2000 .
4. Michelle Provoost (Editor), Matthijs Bouw (Editor) & Camiel Van Winkel, "The Stadium: Architecture of Mass Sport", Rotterdam : NAI Publishers, 2000.

B.ARCHITECTURE (SEMESTER – VI)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARF–356 Duration of Examination :viva voce
Course Title: Project Oriented Study Tour Credits : 02 (L=0,T=0,U=0)

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. The tour shall be of one to two weeks of duration.

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, who accompanied the tour, as part of the internal assessment.

B.ARCHITECTURE (SEMESTER – VII)
(Under Credit Based Continuous Evaluation 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 inclusive of vacation.

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. 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. Space Usage
2. Circulation
3. Built in Furniture
4. Services
5. Constructional Techniques
6. Materials used etc.

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.

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

Course Contents:

PART I

- Definition of 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.

PART II

- Housing as a major component of a settlement, neighborhood concept–definition, Radburn layout, Clarence Perry's principles of layout, physical elements, community facilities, design criteria, selection of housing types, circulation etc.
- Housing standards–meaning, purpose & criteria, standards prescribed by HUDCO, NBC etc.

PART III

- Problems of slums and housing for the poor–definition of slums, factors responsible for creation, features, Govt. schemes for improvement; low cost housing–meaning and role for housing the poor, low cost materials and techniques, use of local materials, Approach of Laurie Baker, HUDCO (Building Centres), CBRI and others.
- Techniques of appraisal of housing enclaves, physical, social, economic and environmental components; surveys – definitions, importance, types, advantages, disadvantages, sample, sampling, preparation of questionnaire–types, sequence and format of questions

Suggested Readings:

1. Rangwala, S.C. “Town Planning”, Charotar Publishing House, New Delhi, 2009.
2. Gallion, A.B. & Eisner, S. “Urban Pattern: City Planning and Design”, Van Nostrand, New York, 1975.
3. Christoper, Alexander, “A Pattern Language”, Oxford University Press, New York, 1977.
4. Lynch, Kevin. “City Sense and City Design”, MIT press 1990.
5. Unterman, Richard & Small, Robert. “Site Planning for Cluster Housing”, Van Nostrand Publishers, New York, 1977.
6. Schoenauer, Norbert. “6000 Years of Housing”, W. W. Norton & Company, 2000.

B.ARCHITECTURE (SEMESTER – VIII)
(Under Credit Based Continuous Evaluation 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 material 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 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.

PART–III

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.

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.

B.ARCHITECTURE (SEMESTER – VIII)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARL–453 Duration of Examination: 3 hrs
Course Title : Vernacular Architecture Credits: 03 (L=2,T=1,U=0)

Course Contents:

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.

Settlement pattern, building material/ technology and socio–economic structure in a village of Punjab, Study and analysis of spatial organization, building material/technology, public places, housing, aesthetics of a village in Punjab.

Suggested Readings:

1. Jain, Kulbushan & Jain, Meenakshi. Architecture of the Indian Desert, Aadi Centre, Ahmedabad.
2. Michell, George. The Royal Palaces of India, Thames and Hudson Ltd., London.
3. Oliver, Paul. Encyclopedia of Vernacular architecture of the World, Cambridge University Press, 1997.
4. Pramar, V.S. Haveli – Wooden Houses & Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
5. Tillotsum, G.H.R. The Tradition of Indian Architecture – Continuity & Controversy – Change since 1850, Oxford University Press.
6. Kagal, Carmen. Vistara – The Architecture of India, Pub: The Festival of India, 1986.
7. Rappoport, Amos. House, Form & Culture, Prentice Hall Inc, 1969.

B.ARCHITECTURE (SEMESTER – VIII)
(Under Credit Based Continuous Evaluation 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:

Details of lift slab and slip form method of construction

Detailing of curtain walls and wall claddings.

Construction details of prefabricated and precast building components

Construction details for earth quake resistant structures (low rise)

Different types of foundations for buildings

Swimming pool details types/materials/construction techniques/services

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', British Library Cataloguing in Publication Data, London, 1990.
5. Barry, R. Building Construction, East West Press, New Delhi, 1999.

B.ARCHITECTURE (SEMESTER – VIII)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARU–455 Duration of Examination: viva voce
Course Title : Architectural Design-VII Credits: 10 (L=2,T=0,U=08)

Course Contents:

Studio Project would put emphasis on learning methodology to study the historic places by practicing a systematic approach to prepare inventory and doing documentation of a historic site & structure to understand the spatial form, architecture and traditional construction techniques employed in the historic structure.

The project would incorporate assessment of values and present state of conservation to prepare proposals/recommendations for the conservation of selected historic site/structure.

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., 1969.

B.ARCHITECTURE (SEMESTER – VIII)
(Under Credit Based Continuous Evaluation Grading System)

Course Code: ARL–456 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.

B.ARCHITECTURE (SEMESTER – VIII)
(Under Credit Based Continuous Evaluation Grading System)

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 Services, 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, 2005.
6. Hutchinson, Barton and Ellis, Maintenance & Repair of Buildings, Butterworth & Co. (Publishers) Ltd., 1975.

B.ARCHITECTURE (SEMESTER – VIII)
(Under Credit Based Continuous Evaluation Grading System)

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, 2001.
2. Rosenfield, Isadore; Hospital Architecture and Beyond, Van Nostrand Reinhold Company, New York.
3. Rotterdam, Bouwcentrum; General Hospitals, Elsevier Publishing Company, Amsterdam.

B.ARCHITECTURE (SEMESTER – IX)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–501 Duration of Examination: 03 Hrs
Course Title : Town Planning Internal Assessment: 40
Periods per Week: 03 (L=02.TU=01.ST=0) University Examination: 60

Course Contents:

UNIT I

History of Town Planning: Historical perspective of urban growth & form in ancient societies (special emphasis on India), Classic cities of the Greek & Roman periods, An overview of urban pattern of medieval town, the renaissance & neo classic city, the industrial revolution & factory towns, Salient features of the ideas & concepts of Ebenezer Howard & Sir Pattrick Geddes

UNIT 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, Concept of planning; meaning, importance and scope of planning process; planning as a continuous process, Theories of urban structure: Concentric zone, Sector and Multiple nuclei theory

UNIT III

Preparation of Plans: Master Plan and its components, Concept of Perspective, Development and Annual plans, Planning at city level: Concept of zoning (use, height and density zoning); landuse planning (residential, commercial, industrial, etc.); urban aesthetics, Site Planning: General guidelines and basic principles of site planning

UNIT IV

Planning surveys: Process, various categories of surveys such as physical, socio-economic, traffic, etc., planning data, its presentation & analysis. New towns: Planning considerations & application of spatial standards, Case study of Chandigarh city (planning considerations & planning concept)

B.ARCHITECTURE (SEMESTER –IX)
(Under Credit Based Continuous Evaluation Grading System)

UNIT V

Implementation & Administration: Broad provisions of the Acts related to city planning - Punjab Regional and Town Planning and Development Act, 1995, Land Acquisition Act, 1984 and 74th Constitutional (Amendment) Act, 1992. Role of various planning and development authorities - Municipal Corporation, Improvement Trust, Punjab Urban Development Authority, TCPO and HUDCO

Suggested Readings:

1. Gallion, Arthur B. & Eisner, Simon. The Urban Pattern: City Planning and Design. New York: D. Van Nostrand Company. 1983.
2. Keeble, Lewis. Principles and Practice of Town and Country Planning. London: The Estates Gazette. 1969. The University of Michigan.
3. *UDPFI (Urban Development Plans Formulation & Implementation) Guidelines* by Ministry of Urban Affairs & Employment, GOI
4. Whittick, Arnold. Encyclopedia of Urban Planning, New York: McGraw-Hill. 1974.

B.ARCHITECTURE (SEMESTER – IX)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–502 Duration of Examination: 03 Hrs.
Course Title : Project Management Internal Assessment: 40
Periods per Week: 03 (L=02.TU=01.ST=00) University Examination: 60

Course Contents:

UNIT I

Introduction to the concept of standardization in building design, Modular co–ordination, its objectives, basic planning and structure modules. Application to advantages and disadvantages of pre–fabrication, various types of prefabrication, their advantages and disadvantages, simple details of prefabrication.

UNIT II

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.

UNIT III

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.

UNIT IV

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.

B.ARCHITECTURE (SEMESTER –IX)
(Under Credit Based Continuous Evaluation Grading System)

UNIT V

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

Suggested Readings:

1. Punmiya, 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, 2009.

B.ARCHITECTURE (SEMESTER – IX)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–503 Duration of Examination: 03 Hrs.
Course Title: Green Buildings Internal Assessment: 40
Sustainable Architecture University Examination: 60
Periods per Week: 03(L=02.TU=01.ST=00)

Course Contents:

UNIT I

Introduction to concept of green buildings, efficient use of energy, water and other resources. Protecting occupant health and improving employee productivity.

UNIT II

Reduction in waste, pollution and environment degradation. Sustainable design to achieve environmental, economic and social benefits. Concept of L.C.A (life cycle assessment)

UNIT III

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

UNIT IV

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.

UNIT V

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

B.ARCHITECTURE (SEMESTER –IX)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–504 Duration of Examination: 03 hrs
Course Title: Multistoried Buildings Internal Assessment : 40
Periods per week : 03 (L=02.TU=01.ST=00) University Examination : 60

Course Contents:

UNIT I

A Study of reasons for and methods of high rise developments in our urban centers.

Need for Multi storied development.

UNIT II

Sitting of multi storied buildings.

Problems caused by multi storied buildings.

UNIT III

Construction methods.

UNIT IV

Services in multi storied buildings.

UNIT V

Form of multi storyed buildings and their effect of urban scape psychological implication of using such spatial organizations.

Suggested Readings:

1. Viswanath H.R., Tolloczko J., Clarke J.N., Multi-purpose High-rise Towers and Tall Buildings, Spon Press, 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
6. World Scientific, 2001
7. Taranath B.S., Reinforced Concrete Design of Tall Buildings, CRC Press, 15-Aug, 2009
8. Mittal A K, Electrical and Mechanical Services in High Rise Buildings, CBS, 2009

B.ARCHITECTURE (SEMESTER – IX)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–505 Duration of Examination: 03 hrs
Course Title : Housing Internal Assessment : 40
Periods per week : 03 (L=02.Tu=01.St=00) University Examination : 60

Course Contents:

UNIT I

Definition of 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.

UNIT II

Housing as a major component of a settlement, neighborhood concept–definition, Radburn layout, Clarence Perry's principles of layout, physical elements, community facilities, design criteria, selection of housing types, circulation etc.

UNIT III

Housing standards–meaning, purpose and criteria, standards prescribed by HUDCO, NBC etc.

UNIT IV

Problems of slums and housing for the poor–definition of slums, factors responsible for creation, features, Govt. schemes for improvement; low cost housing–meaning and role for housing the poor, low cost materials and techniques, use of local materials, Approach of Laurie Baker, HUDCO (Building Centres), CBRI and others.

UNIT V

Techniques of appraisal of housing enclaves, physical, social, economic and environmental components; surveys – definitions, importance, types, advantages, disadvantages, sample, sampling, preparation of questionnaire–types, sequence and format of questions

Suggested Readings:

1. Rangwala, S.C. “Town Planning”, Charotar Publishing House, N. Delhi, 2009.
2. Gallion, A.B. & Eisner, S. “Urban Pattern: City Planning and Design”, Van Nostrand, New York, 1975.
3. Christopher, Alexander, A Pattern Language, Oxford University Press, New York, 1977.
4. Lynch, Kevin, “City Sense and City Design”, MIT press 1990.
5. Unterman, Richard & Small, Robert, “Site Planning for Cluster Housing”, Van Nostrand Publishers, New York, 1977.
6. Schoenauer, Norbert, “6000 Years of Housing”, W. W. Norton & Company, 2.

B.ARCHITECTURE (SEMESTER –IX)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–506	Duration of Examination: 04 hrs
Course Title: Building Construction - VIII	Internal Assessment : 120
Periods per week : 06 (L=01.TU=0.ST=05)	University Examination : 80

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

B.ARCHITECTURE (SEMESTER – IX)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–507 Duration of Examination: 20 hrs
Course Title : Architectural Design - VIII Internal Assessment : 180
Periods per week : 12 (L=02.TU=01.ST=10) University Examination : 120

Course Contents:

Hospital, District Centre, Industrial Complex, Five Star Hotel.

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. "Hospital Architecture" Edited by Christine Nickl-Weller and Hans Nickl, Verlagshaus Braun, 2009.

B.ARCHITECTURE (SEMESTER – X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–551 Duration of Examination: 03 Hrs.
Course Title: Advanced Structure System Internal Assessment: 40
Periods per Week: 03 (L=02.TU=01.ST=00) University Examination: 60

Course Contents:

UNIT 1

Importance of Structure system for Architect.
Criteria for selection of:

- Structure system with respect to span, height and form of the building
- Material for each type of structure system.

Framed Structures: Simple frame, multiple frame, criteria incorporated in the plan of building, location of members.

UNIT II

One way slab; identification, span relevance
Two way slab; identification, span relevance, criteria of design,
Flat slab; types, design criteria, suitability.
Waffle slab; design consideration, suitability, types.

UNIT III

Barrel shell; definition, long and short barrel shell, membrane action, bending action, thermal displacement, stiffness.
Folded slabs/ shell; lever arm demonstration, beam action, types, suitability.
Hyperbolic paraboloids; definition, stress generated, types of paraboloids, suitability, bending action.

UNIT IV

Domes; definition, hoop and meridian stresses, high rise dome, shear mechanism, suitability.
Space frame; definition, composition, detailed connections, span criteria and suitability.
Geodesic dome; definition, theory behind the development, examples from nature, design variables, suitability.

UNIT V

High rise buildings; definition, lateral load design philosophy, concept of premium for height, factors responsible for reducing the weight of structure, structural scheme options, cross bracing system, framed tubes, non–tubular schemes, Shear walls , Cross Bracing & Foundation for multistory building

B.ARCHITECTURE (SEMESTER – X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–552 Duration of Examination: 03 hrs
Course Title: Interior Design Internal Assessment : 40
Periods Per Week : 03 (L=02.TU=01.ST=00) University Examination : 60

Course Contents:

UNIT 1

Introduction to Interior Design, Role of Interior Design in Architectural Profession

UNIT II

The Principles of Aesthetic composition:
- Form, shape and configuration
- Size, scale and proportion
- Equilibrium: Symmetry in balance
- Axis and alignment
- Repetition and rhythm
- Contrast and opposition
- Vista and view
- Texture pattern and colour
- Light: Natural and artificial

UNIT III

A brief historical perspective of Interior design in various periods
- The ancient/médiéval concept
- Renaissance concept
- The modern concept

UNIT IV

Components and materials for interiors
- Walls, Floors, Doors, Windows and closets.
- Fixed furniture components: seating, tables, counters, cupboards and cabinets
- Accessories: Utilitarian and decorative
- Furnishing: Rugs, Window coverings, shutters, shades, blinds, curtains.

UNIT V

Design development
- Residential spaces
- Commercial spaces

B.ARCHITECTURE (SEMESTER –X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–553 Duration of Examination: 03 hrs
Course Title: Advanced Building Technology Internal Assessment : 40
Periods per week : 03 (L=02.TU=01.ST=00) University Examination : 60

Course Contents:

UNIT I

Foundation: Function, Bearing Pressure on soils, Choice of Foundation type, Types of foundation

UNIT II

Floor Structures: Functional requirements, Solid concrete floor slab, flat plate floor, Flat slab floor, Tee beam or ribbed floor. Hollow block floor, Waffle slab floor, Diagonal beam floor, Pre cast floors (beams & Panels) spring floors, openings & services in concrete floors

UNIT III

Multistorey Structures: Frame & load bearing wall, site, type & use of building, Span & spacing of beams, choice of material, slipform construction, Lift slab construction

UNIT IV

Pre cast concrete structures, Pre stressing, Post tensioning, Pre fabrication and its advantages & disadvantages.

UNIT V

Roof Structures: Functional requirements, Method of construction of trusses & girders, (latticed) Frames & their types, shall roof (singly curved, doubly curved, hyper bolic, paraboloids, Grid Structures (Single layer, Double layer) Geodesic, Ribbed Domes Folded Plates, Y–beams. Choice of roof structure.

B.ARCHITECTURE (SEMESTER – X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–554 Duration of Examination: 03 hrs
Course Title : Urban Planning Internal Assessment : 40
Periods per week : 03 (L=02.TU=01.ST=00) University Examination : 60

Course Contents:

UNIT I

Concept of planning, categories of planning (economic, social and physical) and their integration, planning at different levels, aims and objectives of physical planning.

UNTI II

Planning approaches comprehensive planning, structure planning and advocacy planning. The city in its regional setting, elements of urban structure, factors affecting the land use distribution.

UNIT III

Site planning site selection criteria, general guidelines and basic principles of site planning site planning process–planning of residential commercial and industrial sites.

UNIT IV

Sitting of new towns, procedure and stages of planning for new towns special surveys and studies required. Administrative, financial and legal set up of new towns, Basics to evolve development controls.

UNIT V

Role of non government organizations in urban development, role of private organizations in urban development and their relations with local/state government .Citizen/public participation in urban development.

B.ARCHITECTURE (SEMESTER –X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC–555 Duration of Examination: 03 Hrs.
Course Title : Architectural Conservation Internal Assessment: 40
Periods per Week: 03(L=02.TU=01.ST=00) University Examination: 60

Course Contents:

UNIT 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.

UNIT II

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.

UNIT 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 cause and classification of different agents of deterioration.

UNIT IV

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 & relevance of historic building/area in present context

UNIT V

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.

Suggested Readings:

1. Bernard M. Feilden; Conservation of Historic Buildings (*Architectural Press)*
2. Derek Latham; Creative Re-use of Buildings *(Donhead)*
3. Divay Gupta; Identification and Documentation of Built Heritage in India *(INTACH)*
4. Meredith H. Sykes; Manual on Systems of Inventorying Immovable Cultural Property *(UNESCO)*
5. A.G.K. Menon, B.K. Thapar; Historic Towns and Heritage Zones *(INTACH)*
6. International Charters for Conservation and Restoration *(ICOMOS)*
7. Hisham Mortala; Traditional Islamic Principles of Built Environment.

B.ARCHITECTURE (SEMESTER –X)
(Under Credit Based Continuous Evaluation Grading System)

Course Code : ARC – 556 Duration of Examination: Viva Voce
Course Title: Architectural Thesis Project Internal Assessment: 240
University Examination: 510

Course Contents:

1. Thesis*:* The development of thesis is the student's opportunity to prove that he/she has adequate ability to handle all phases of a building design; the definition of thesis is a preposition that one offers to be proved. It is subject for scholastic study through analysis. It is a development and presentation of the design of a building. Including its setting in a specific environment and its technical aspects. In former times, the thesis was perhaps only evidence of a student's academic ability offered for the educational inspection.

2. Subject of Thesis*:* After an orientation talk by a member of the Faculty each student will submit to the Head of Department his / her subject he / she proposed to work upon. The criterion for the choice of the subject will be its relevance to the actual needs of the country. The students will commence the work on the subject only after it has been approved by the Board of Control.

3. Contents of Thesis*:* Among other things, a thesis project will comprise of the following:

(a) A written and illustrated report which should include validity of the chosen project methodology, prototype studies, client's and architect's brief, design criteria along with sketches, photographs, tables and diagrams.

(b) A fully worked – out design.

4. Submission of Thesis*:* Students will submit two copies of their thesis report complete in all respects to the Head of the Department at the end of the University's semester. One copy will be retained by the Department and other sent for transmission to the respective external examiners.

Other Thesis material, such as drawings and models etc. will be received and retained by the Head of the Department after eight (8) weeks from the date of the submission of report.

5. Procedure of Marking Thesis*:* Each student shall be assigned a thesis guide from amongst the teaching faculty and or practicing architect whose name shall be approved by the Board of Control.

One of the senior members of the faculty to be nominated by the BOC shall act as Thesis Coordinator while the Head of Department shall be the examiner and would be a member of jury for all the students.

The Thesis submission shall be made in the following stages:

Synopsis.

Rough Report.

Preliminary submission.

Presentation drawings and other material.

Note: A teaching load of 3 periods per week for each student shall be allowed to the concerned thesis guide.