

SHRI SIDDHESHWAR SHIKSHAN MANDAL'S
COLLEGE OF ARCHITECTURE, SOLAPUR

Bachelor of Architecture

Second Year - Semester –III and Semester –IV

Syllabus

(W.E.F. 2015-16)

(Credit system structure)

SSSM'S COLLEGE OF ARCHITECTURE, SOLAPUR

Faculty of Engineering & Technology

Credit System structure of Second Year B.Arch W.E.F. 2015-2016

Semester III

	Course Name	Hrs./Week		Credits			Examination Scheme				
		L/S	P/S		ISE		ESE		ICA		Total
					Max.	Min.	Max.	Min.	Max.	Min.	
Subject code	Theory papers										
AR3-02	Building Services – I	3	—	3	30	14	70	32	—	—	100
AR3-03	Architectural Graphics- III	4	—	4	30	14	70	32	—	—	100
AR3-04	Climatology and Environment - I	3	—	3	30	14	70	32	—	—	100
AR3-06	Theory of Structure- III	3	—	3	30	14	70	32	—	—	100
AR3-07	History of Architecture - III	3	—	3	30	14	70	32	—	—	100
	Total	16	—	16	150	—	350	—	—	—	500
	Studio / practical / oral										
AR3-01	Architectural Design –III	—	8	4	—	—	100	45	150	68	250
AR3-05	Bldg. Construction & Material - III	—	6	3	—	—	50	23	100	45	150
AR3-08	Computer Technology in Architecture-III	—	4	2	—	—	50	23	50	23	100
	Total	—	18	09	—	—	200	—	300	—	500
	Grand Total	16	18	25.00	150		550		300		1000

Abbreviations: L- Lectures, P –Practicals, S - Studios, ISE- In Semester Exam., ESE - End Semester exam, ICA- Internal Continuous Assessment

Note : ISE -Internal Tests , **ESE** - University Theory/ Oral examination

SSSM'S COLLEGE OF ARCHITECTURE, SOLAPUR

Faculty of Engineering & Technology

Credit System structure of Second Year B.Arch W.E.F. 2015-2016

Semester -IV

	Course Name	Hrs./Week		Credits			Examination Scheme				
		L/S	P/S		ISE		ESE		ICA		Total
					Max.	Min.	Max.	Min.	Max.	Min	
Subject code	Theory papers										
AR4-02	Building Services – II	3	—	3	30	14	70	32	—	—	100
AR4-03	Architectural Graphics- IV	4	—	4	30	14	70	32	—	—	100
AR4-04	Climatology and Environment - II	3	—	3	30	14	70	32	—	—	100
AR4-06	Theory of Structure- IV	3	—	3	30	14	70	32	—	—	100
AR4-07	History of Architecture - IV	3	—	3	30	14	70	32	—	—	100
	Total	16	—	16	150	—	350	—	—	—	500
	Studio / practical / oral										
AR4-01	Architectural Design –IV	—	8	4	—	—	100	45	150	68	250
AR4-05	Bldg. Construction & Material - IV	—	6	3	—	—	50	23	100	45	150
AR4-08	Surveying And Levelling	—	4	2	—	—	—	—	100	45	100
	Total		18	09	—	—	150	—	350	—	500
	Grand Total	16	18	25.00	150		500		350		1000
2014EG	Environmental studies (As S.U.S.rules and regulations)	4	---	4	30	14	70	32	---	----	100

Abbreviations: **L**- Lectures, **P**- Practicals , **S**- Studios, **ISE**- In Semester Exam., **ESE** - End Semester exam, **ICA**- Internal Continuous Assessment
Note : **ISE** -Internal Tests , **ESE** - University Theory/ Oral examination

SSMS COLLEGE OF ARCHITECTURE , SOLAPUR
FACULTY OF ENGINEERING AND TECHNOLOGY
CREDIT SYSTEM STRUCTURE OF B.ARCH. W.E.F.2014-2015

CONVERSION OF MARKS INTO GRADES				
Sr.No.	Range of Marks	Grade	Grade Point	Description of Performance
1	80 onwards	O	10	EXCELLENT /OUTSTANDING
2	70-79	A+	9	VERY GOOD
3	60-69	A	8	GOOD
4	55-59	B+	7	FAIR
5	50-54	B	6	ABOVE AVERAGE
6	45-49	C+	5	AVERAGE
7	<45	F	0	FAIL
8		XX	0	DETAINED
9		DR		DROPPED OUT

CONVERSION OF AVERAGE GRADE POINTS INTO GRADES		
Sr.No.	SGPA/CGPA	Grade
1	9.5-10	O
2	8.5-9.49	A+
3	7.5-8.49	A
4	6.5-7.49	B+
5	5.5-6.49	B
6	4.5-5.49	C+
7	<4.49	F

NOTE

1. THE PASS PERCENTAGE SHALL NOT BE LESS THAN 45% IN EACH SUBJECT .

2.THE PASS PERCENTAGE SHALL NOT BE LESS THAN 50% IN THE AGGREGATE FOR THE ACADEMIC YEAR.

A CANDIDATE WHO FAILS TO SECURE MINIMUM 50% MARKS IN THE AGGREGATE FOR THE ACADEMIC YEAR, SHALL APPEAR FOR THE IMPROVEMENT EXAM ,ONLY IN UNIVERSITY THEORY EXAM.

III SEMESTER

AR3-01 : ARCHITECTURAL DESIGN - III

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture/ Studio - L/S	--	--	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	08	4	ISE	ESE	ICA	ESE		
Total	08	4	--	--	150	100	250	

Objective:

Architectural Design as a core subject of Architectural Studies. The objective is to study the fundamentals of design process and application of the knowledge gained in other subjects, towards designing of spaces. The student is expected to collect, analyze, learn the process of Design and approach to the Design.

Course Outline:

1. Identification and Application of elements of design to achieve design principles in Architecture.
2. Approach to design as a continuous process through function, technology and aesthetics (basic components) of the building and their function.
3. To learn the basics of design e.g. Form, proportion, scale etc to develop design skills with respect to needs, limitations, constraints, usage pattern.
4. Study of groups of objects forms, masses with basic geometric forms, their composition for two and three dimensional study.

Scope of the project :

1. Design problem of built-up area about 300 to 500 sq.m
2. Plot areas can vary from 3-4 times of the built up area
3. Types of buildings residences, Nursery Schools, small club houses, village library/ vegetable market sheds/ polyclinics, public toilet complex, etc.
4. Introduction of climatology, different types of climates and applications.
5. Climate selection as per groups.
and one time bound problem of built up area about 150-300 sq.m.

Design process:

1. Case studies and methodology
2. Circulation and site analysis programme and requirement analysis.
3. Data collection and analysis like circulation, bubble diagram, climatic response
4. Conceptual plans and study models
5. Actual plans and climatological details
6. Floor plans, elevations, sections, views and models
7. Design problems of medium complex function, low rise buildings with more than four functions as Post office, Restaurant, Poly clinic, Bank, Residence, Farm house, Gallery etc.

Sketching :

1. Freehand sketching with different medium. Of case studies ,detailing of individual spaces and surfaces, volumetric analysis ,conceptual plans.
2. Sketch book size, papers, to be specified.(Preferable half of A4).

Submission :

1. Sketch file
2. Case study reports and data collection in file form
3. Design port folio (as per choice)
4. Design Models

Marking:

1.	Site climate analysis and concept	25
2.	Floor plans	25
3.	Sections & elevation	30
4.	Views /Models & Presentation	20

Reference Books:

1. Man climate architecture
2. Francis D.K. Ching –Elements of Architecture
3. Neuferts Data
4. Walter Gropius – Total Architecture
5. Prammar V.S. – Fundamentals in Architecture

AR3 – 02 : BUILDING SERVICES – I

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture - L/S	03	03	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	--	--	ISE	ESE	ICA	ESE		
Total	03	03	30	70	----	----	100	

Sanitation

Objective:

Introduction to sanitation & its importance.

Planning and layout of sanitary fittings and drainage for a single and multistoried buildings.

Course Outline:

Systems of sanitation –

1. Methods of collection
2. Sewerage systems
3. Patterns of collection systems
4. Drains and Sewers sections, material used, Pumping of sewage
5. Sewer joints – Types of various joints and methods for making joints.

Sewer appurtenances- (introductory , sketches and function)

1. Manhole, Drop manhole, Lamp hole, Street inlets, flushing tank, catch basins, Sand, grease and oil traps, Inverted siphon, Storm water relief works etc..
2. Laying of the sewer line
3. Testing of the sewer lines
4. Ventilation of sewer

Maintenance of sewers – (introductory)

Causes, precautions to be taken

House drainage -

1. Meaning and principles of house drainage systems, drainage systems for residences.
2. Different types of Traps, Inspection chamber, Pipes and fitting, Antisiphonage pipe ventilation of house drainage systems.
3. Sanitary fittings (Ablution fixtures and Soil fixtures)
4. Wash basin, Sinks, Bath tub, Flushing cistern, water closet – Indian type, European type and Anglo-Indian type.
5. Urinals – Bowl type, Stall type, Squatting plate urinals.
6. Slop sink, Bidet
7. Ventilation of fittings, connections to sewage/ salvage pipes, Materials for these fittings, Testing of fittings and there connections and installation.
8. Systems of plumbing and connection to public system, Intercepting and other types of chambers.

Submission- Files & Sketches

Reference Books

1. Building Services : By S. M. Patil
2. Building Services : By Shubhangi Bhide
3. Water Supply and Sanitation : By G. S. Birde
4. Water Supply and Sanitation : By Rangwala and Punmia and Guracharansingh

AR3 – 03 : ARCHITECTURAL GRAPHICS - III

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture - L/S	04	04	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	--	--	ISE	ESE	ICA	ESE		
Total	04	04	30	70	----	----	100	

Objectives:

To Introduce the students to the fundamental techniques of Architectural drawings & to enhance their visualization skills.

Course Outline :

1. Introduction to Perspective drawing
2. Principles of one point, two point, and three point perspective of simple Geometric objects.
3. Perspective of interior and exteriors and building parts etc.
4. Introduction to Sciography, Study of shade and shadows.

Submission :

The Classwork portfolio pertaining to the above topics.

Reference Books :

Engineering Drawing – By N.D. Bhat

AR3 – 04 : CLIMATOLOGY & ENVIRONMENT-I

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture - L/S	03	03	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	--	--	ISE	ESE	ICA	ESE		
Total	03	03	30	70	----	----	100	

Objective :

Study relation between built form & elements of Climate.

Study behavior of built form in different climatic conditions & Design responding to climate.

Study different climate & elements of climate.

Course Outline:

1. Introduction to climate & Global climate.
2. Elements of Climate
3. All tropical climate
4. Micro climate & macro climate , Micro climate analysis
5. Bio Climate Designs & Bio climatic chart
6. Sun dial & Sun path dial

Submission :

1. File along with sketches
2. 10 min PPT presentation on any climate responsive building (case study) Book /Live OR
Any topic from the syllabus

Reference Books

1. Climate Responsive Architecture – Arvind Krishna
2. Hand book : Solar Passive Architecture – M Emanuel levy
3. Climatology & Environment - Manual (IIT)
4. IMD Data

AR3 -05 : BUILDING CONSTRUCTION AND MATERIAL –III

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture - L/S	--	--	Theory Exam -		Practical / Oral Exam		Total
Practical/Studio P/S	06	3	ISE	ESE	ICA	ESE	
Total	06	3	---	---	100	50	150

Objectives :

To help students to understand the basic building elements, their function.

Main outline of this study is to develop strong sense of understanding the basic principles of construction and materials ,to develop analytical and logical sequence in thinking, through site visits, material study.

Course outline :

Construction :

1. Doors and Windows:
All types of heavy TW doors, windows and partitions joinery details.
Ironmongery and fixtures used.
2. Floorings :
Method of Construction and laying of flooring with various materials and repairing, skirting, dadoing.
Waterproofing treatment for toilets blocks and terraces.
Laying of paving with paving materials.
3. Staircases :
Types of staircases, construction method of staircases using stone, brick, timber, RCC,steel. Fire escape staircase
Introduction to escalators.

Materials :

1. Timber :
Use & application of timber in building construction –Timber- plywood, block boards, hardboards and veneers
Timber boards and eco- boards.

2. Mortar :
Lime mortar, Cement mortar, properties, proportion, mixing, application.
Introduction of mud and surkhi mortar
3. Flooring :
Natural stones and processed floorings, Artificial flooring materials
Bitumen and waterproofing materials, Asphalt, various types of asphalt, use of bitumen felt.
Other waterproofing systems for roofs, walls, plaster etc.
4. Paving materials:
Properties, types, and application.

Submission :

1. B.T. portfolio with sketch.
2. Files and notes of construction and materials.
3. Actual samples of materials
4. Photos, data, PPT of material usage

Reference books :

For Construction –

1. Building construction – Mc. Kay
2. Building construction – Chudley
3. Building construction – Barry
4. Building construction – Punmia B.C.
5. Building construction – Rangwala
6. Building construction – Mitchell

For Materials –

1. Building Material - Sushilkumar
2. Building Material - Rangwala

AR3-06 : THEORY OF STRUCTURES – III

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture - L/S	03	03	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	--	--	ISE	ESE	ICA	ESE		
Total	03	03	30	70	----	----	100	

Objectives:

Students completing the course will have:-

Ability to employ the knowledge of mechanics to understand the behaviour of structure.

Ability to identify principal planes and find principal stresses.

Course Outline :

1. Simple Bending

Moment of inertia and section modulus for various structural shapes. Theory of simple bending: $M/I = f/y = E/R$ application of flexural formula

2. Principal stresses and principal strains

Normal and shear stresses on any oblique plane; Concept of principal planes and principal stresses; Derivation of principal stresses, maximum shear stresses

3. Shear stresses

Shearing stresses in beams – distribution of shear stress over different sections (rectangular, circular I And T)

4. Soil

Concept of soil mechanics and its importance, different types of soils and their properties. Concept of consolidation and compaction Earth Pressure- Concept, Area of application, earth pressure at rest, active and passive condition.

5. Fixed and continuous beam

Concept of fixed and continuous beam. SFD and BMD of simple fixed and continuous beam.

6. Arches and domes

Concept of arches, three hinged arches and chimneys & domes.

Submission – File & Sketches

Reference books:

1. Strength of Materials by R.K.Bansal, Laxmi Publications
2. Strength of Materials by Bhavikatti, Vikas Publications, New Delhi.
3. Strength of Materials by Ramamurtham, Dhanpatrai & Sons, New Delhi
4. Strength of Materials by R.S.Khurmi, S.Chand Publication, New Delhi
5. Mechanics of Structures (Part I) by S.B.Junnarkar, Charotar Book House,
6. Strength of Materials by R.K.Rajput, S.Chand Publication, New Delhi
7. Soil Mechanics by B.C. Pummia

AR3–07 : HISTORY OF ARCHITECTURE-III

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture - L/S	03	03	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	--	--	ISE	ESE	ICA	ESE		
Total	03	03	30	70	----	----	100	

Objectives :

To study the evolution of Indian (Hindu) and western architecture .

Study of Architectural Characters in general. Space and form structural system, building materials and constructions, solids and voids, color and texture overall architectural composition with reference to selected example in particular.

Course Outline:

Indian Architecture – Eight century to twelfth century.

1. Hindu Temple Architecture :

A) Northern Hindu Temples - Indo-Aryan temples

- a) Orissan group –Lingraj Temple at Bhuvaneshwar , Sun Temple at Konark
- b) Khajuraho group –Khanderiya Mahadeva

B) Central hindu temple – Chalukyan temples, Rock-cut – Kailasha Temple at Ellora, Structural –Hoyasaleshwar Temple at Halebid , Chennakeshwar Temple at Belur.

C) South hindu temples –Dravidian temples -Vaikuntha Perumal Temple at Kanchipuram, Minakshi Sundaram Temple at Madhurai.

2. Jain Architecture – Choumuk Temple of Adinath at Ranakpur,

3. Western Architecture –

Gothic & renaissance architecture in Europe

- 1. West Minster abbey London.
- 2. Church of Saint Peter Rome (new) .

Submission : Files and sketches.

Reference Books:

1. History of Arch. In India – Tadgell christopher
2. Indian Architecture – Buddhist & Hindu period – satish grover
3. Architecture of India – Buddhist & Hindu - Percy Brown
4. History of Arch – Bannister fletcher
5. History of world civilization – J.E. swai
- 6 world Architecture – G.K. Hiraskar
7. A History of fine Arts in India & West – Tomy Edith.

AR3 – 08 : COMPUTER TECHNOLOGY IN ARCHITECTURE – III

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture - L/S	--		Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	04	02	ISE	ESE	ICA	ESE		
Total	04	02	---	---	50	50	100	

Objectives :

Application of computer is widely spread in every field. Computer application particularly in architecture is gaining importance. Thus necessary for every student to understand computers, their application and use in the profession.

Course Outline:

1. Application of blocks and concept of symbols library
2. Drawing at different scale
3. Dimension styles and variable
4. Attributes
5. Data extraction
6. All display command

Concept of 3d work and UCS

1. 3-dimensional drawings – primitives, mesh, surfaces, etc.
2. Viewing commands and view points.
3. Slides.
4. Introduction to shading and rendering
5. Data extraction in the format of dxf., dxb.
6. Introduction of other drafting and presentation software's like auto Architect. 3d- studio, Revit, Archicad, Google Sketch up and their applications.

Submission

3D-presentation drawings with the use of above software's shall be done as a sessional work.

Reference books:

Autocad 2012 –in simple steps-kogent learning solutions

IV SEMESTER

AR4-01: ARCHITECTURAL DESIGN - IV

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/Studio - L/S	--	---	Theory Exam -		Practical / Oral Exam		Total
Practical/Studio P/S	08	04	ISE	ESE	ICA	ESE	
Total	08	04	---	---	150	100	250

Objectives:

Architectural Design as a core subject of Architectural Studies. The objective is to study the fundamentals of design process and application of the knowledge gained in other subjects, towards designing of spaces. The student is expected to collect, analyze, learn the process of Design and approach to the Design.

Course Outline:

1. Identification and Application of elements of design to achieve design principles in Architecture.
2. Approach to design as a continuous process through function, technology and aesthetics (basic components) of the building and their function.
3. To learn the basics of design e.g. Form, proportion, scale etc to develop design skills with respect to needs, limitations, constraints, usage pattern.
4. Study of groups of objects forms, masses with basic geometric forms, their composition for two and three dimensional study.

Scope of the project

- 1.Design built up area about 750 to 1000 sqm
- 2.Plot areas can vary 3-4 times of the built-up area
3. Introduction of climatology, different types of climates and applications.
- 4.Climate selection as per groups.
- 5.Design problems of medium complex function, low rise buildings with more than four functions as Post office, Restaurant,Motel,Museum,Post offices,Bank,etc.

Design process:

1. Case studies and methodology
2. Circulation and site analysis programme and requirement analysis.
3. Data collection and analysis like circulation, bubble diagram, climatic response
Conceptual plans and study models
4. Actual plans and climatological details
5. Floor plans, elevations, sections, views and models

Sketching :

1. Freehand sketching with different medium. Of case studies, detailing of individual spaces and surfaces, volumetric analysis, conceptual plans.
2. Sketch book size, papers, to be specified. (Preferable half of A4).

Submission :

1. Sketch file
2. Case study reports and data collection in file form
3. Design portfolio (as per choice)
4. Design Models

Marking:

- | | |
|--------------------------------------|----|
| 1. Site climate analysis and concept | 25 |
| 2. Floor plans | 25 |
| 3. Sections & elevation | 30 |
| 4. Views /Models & Presentation | 20 |

Reference Books:

1. Man climate architecture
2. Francis D.K. Ching –Elements of Architecture
3. Neufert architects Data
4. Walter Gropius – Total Architecture
5. Pramod V.S. – Fundamentals in Architecture

AR4 – 02 : BUILDING SERVICES - II

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture/ studio - L/S	03	03	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	--	---	ISE	ESE	ICA	ESE		
Total	03	03	30	70	--	--	100	

WATER SUPPLY

Objectives:

Introduction to building water supply its importance and basic approach. Factors to be considered for water supply at the planning stage. Planning and layout for water distribution and storage of single and multistoried buildings and connection to sanitary fixtures.

Course Outline :

- 1. Introduction** : Importance and Necessity of water supply
- 2. Sources of Water** : Surface water Sources , Ground water Sources, Rainfall
- 3. Collection and conveyance –**
 1. Types of Intakes
 - 2.Types of water supply and pipe joints.
 - 3.Laying and joining of pipes.
- 4.Quality and Quantity of water** –Wholesome water, Impurities in water, standards of water quality, per capita consumption.
- 5. Water treatment process – (Introductory)**

Basic principles of water purification system.,Objectives of treatment, Layout for treatment plant and Methods
- 6.Conveyance of Water**

Different types of distribution systems. Layout of distribution systems, methods of water supply, storage reservoirs, and pumps used in water supply system.

7. Service Connections from mains -

Storage of water, Design of water tank, internal plumbing installations, various types of pipes of fittings. Valves and facets

8. Heating of water (Introductory only)- Boilers, pressure boilers, solar Water Heaters**9. Water supply system** for Highrise buildings : (Introductory only)

Submission – Files & Sketches

Reference Books

1. Building Services : By S. M. Patil
2. Building Services : By Shubhangi Bhide
3. Water Supply and Sanitation : By G. S. Birde
4. Water Supply and Sanitation : By Rangwala and Punmia and Guracharansingh

AR4-03: ARCHITECTURAL GRAPHICS- IV

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture/Studio - L/S	04	04	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	--	--	ISE	ESE	ICA	ESE		
Total	04	04	30	70	--	--	100	

Objectives:

To Introduce students the principles of drawing shade & shadow with source of light being sun.

Course Outline :

1. Perspective Sciography of simple and combination geometrical object.
2. Sciography of building in plan, elevation and in perspective.
3. Introduction of photography, use of wide and normal lenses.
4. Advance photographic technique.

Submission :

The Classwork portfolio pertaining to the above topics.

Reference Books :

Engineering Drawing – By N.D. Bhat

AR4 – 04: CLIMATOLOGY & ENVIRONMENT-II

Teaching Scheme Per week			Credit	Examination Scheme				
Lecture/Studio	L/S	03	03	Theory Exam -		Practical / Oral Exam		Total
Practical/Studio	P/S	--	---	ISE	ESE	ICA	ESE	
Total		03	03	30	70	---	---	100

Objective :

To Study the relation between built form & elements of Climate & to Study behavior of built form in different climatic conditions & Design responding to climate .

Course Outline:

- 1) Thermal Design - Heat exchange of Building
- 2) Thermal Control -Passive Design Strategies
- 3) Day lighting - Lighting principle/ factors, Day lighting Designing in buildings

Submission :

1. File along with sketches
2. 10 min PPT presentation on any climate responsive building (case study) Book /Live
OR
Any Climatic strategy
OR
Any topic from the syllabus

Reference Books

1. Climate Responsive Architecture – Arvind Krishna
2. Hand book : Solar Passive Architecture – M Emanuel levy
3. Climatology & Environment - Manual (IIT)
4. IMD Data

AR4 -05 : BUILDING CONSTRUCTION AND MATERIAL –IV

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture/Studio - L/S	--	---	Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	06	03	ISE	ESE	ICA	ESE		
Total	06	03	---	---	100	50	150	

Objectives :

To help students to understand the basic building elements, their function, Construction with specific reference to RCC frame structure.

Main outline of this study is to develop strong sense of understanding the basic principles of construction and materials, to develop analytical and logical sequence in thinking, through site visit & material study.

Course Outline:

Construction :

1.Framed structure:

Principles and methods of Construction of RCC foundation

Principles and methods of Construction of RCC columns

Principle and methods of construction of beams- cantilever, inverted etc.

Principles and methods of construction of RCC slab- one way, two way, cantilever, sloping, filler and waffle slabs, vaults domes, including formwork (introductory) and reinforcement details.

2.Doors and Windows:

MS doors and windows, joinery details.

Material:

1. Cement :

Properties, uses, types, field tests, initial and final setting time.

2. Concrete :

Lime-concrete, Cement Concrete, Properties, Proportion, mixing, application, different sizes of aggregates, water cement ratio, strength of concrete. Ready mix, manufacturing, hoisting, depositing, shuttering and centering, curing etc.

Introduction to reinforcement used in RCC constructions.

Submission :

1. B.T. portfolio with sketch.
2. Files and notes of construction and materials.
3. Actual samples of materials
4. Photos, data, PPT of material usage

Reference books :**For Construction –**

1. Building construction – Mc. Kay
2. Building construction – Chudley
3. Building construction – Barry
4. Building construction – Punmia B.C.
5. Building construction – Rangwala
6. Building construction – Mitchell

For Materials –

1. Building Material - Sushilkumar
2. Building Material - Rangwala

AR4 -06: THEORY OF STRUCTURES – IV

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/Studio - L/S	03	03	Theory Exam -		Practical / Oral Exam		Total
Practical/Studio - P/S	---	---	ISE	ESE	ICA	ESE	
Total	03	03	30	70	---	---	100

Objectives :

Students completing the course will have:-

Ability to employ the knowledge of mechanics to understand the behavior of structures.
Ability to analyze determinate structural members subjected to different types of Loadings.

Course Outline:

1.Axially loaded Columns and struts

Columns and struts, failure of column, types of end conditions, equivalent length of a column, Euler's Column Theory, Rankine's formula and IS code formula, calculations of critical load.

2. Direct and Bending Stresses

Direct and bending stresses, eccentric loading, columns with eccentric loading, Resultant Stress diagrams due to axial loads, uni axial, and biaxial bending; Concept of core of section for standard symmetrical sections. No tension condition

3. Retaining walls

Retaining walls for water and earth pressures with or without surcharge, Rankines formula, conditions of stability, maximum and minimum pressures at base, conditions of no tension, factors of safety against sliding conceptual effect of water logging.

4. Masonry structures

Masonry Structures : Introduction, Structural property and allowable stresses.

5.Slope and Deflections of the Beam

Slope and Deflection of beams- Concept and definition : cantilevered and simply supported with different loading, relation between slope, deflection and curvature. Simple problems with double integration method.

6.Introduction to Working and limit state method

Concept of Working and limit state method.

Submission

Assignments on each topic.

Reference Books :

1. Strength of Materials by R.K.Bansal, Laxmi Publications
2. Strength of Materials by Bhavikatti, Vikas Publications, New Delhi.
3. Strength of Materials by Ramamurtham, Dhanpatrai & Sons, New Delhi
4. Strength of Materials by R.S.Khurmi, S.Chand Publication, New Delhi
5. Mechanics of Structures (Part I) by S.B.Junnarkar, Charotar Book House, Anand.
6. Strength of Materials by R.K.Rajput, S.Chand Publication, New Delhi

AR4-07 : HISTORY OF ARCHITECTURE- IV

Teaching Scheme Per week			Credit	Examination Scheme				
Lecture/Studio	L/S	03	03	Theory Exam -		Practical / Oral Exam		Total
Practical/Studio	P/S	--	--	ISE	ESE	ICA	ESE	
Total		03	03	30	70	--	---	100

Objectives:

Study of particular style with respect to various influences like geographical, social, economical, religious, political, cultural, Arts & Crafts, Science and Technology & Architectural Characters in general. Space and form structure system, building materials and constructions solids and voids, color and texture overall architectural composition with reference to selected example in particular.

Course Outline :

Indian Architecture

1. Islamic Architecture in India From 12th Century to 17th Century
2. Imperial style at Delhi- Quwt-ul, Islam – Mosque, Complex at Delhi, tomb of Ghias-ud din Tughalaq
3. provincial style – Deccan, Mosque at Gulbarga, Ibrahim Rouza at Bijapur, Golgumbaz at Bijapur.
4. Moughal style - Fatehpur Sikri –(Buland Darwaja, Salim Chisthi's Tomb , Panchamaharaj, Raja Birbals house , Pancha Mahal , Jodhabais Palace , Diwane Am , Diwane Khass) , Tajmahal at Agra, Mughal Garden- Shalimar Bhagh

Colonial Architecture Under British Rule

1. Example Victoria Terminus Station at Mumbai, Rashtrapati Bhavan, Parliament House, Rajpat New Delhi.

Submission : Files and sketches.

Reference Books:

1. History of Arch. In India – Tadgell Christopher
2. Indian Architecture – Islamic Architecture – Satish Grover
3. Architecture of India – Islamic Architecture - Percy Brown
4. History of Arch – Bannister Fletcher
5. World Architecture – G.K. Hiraskar
7. A History of fine Arts in India & West – Tomoy Edith.

AR4-08 : SURVEYING AND LEVELLING

Teaching Scheme Per week		Credit	Examination Scheme					
Lecture - L	--		Theory Exam -		Practical / Oral Exam		Total	
Practical/Studio P/S	04	02	ISE	ESE	ICA	ESE		
Total	04	02	---	---	100	---	100	

Objectives :

On completion of the course the students will be able to, survey for buildings, Prepare contour maps and other surveying maps.

Course outline:

1. Introduction of survey: aims, objects & importance of subject.
2. introduction to land record survey, index map, top sheets.
3. Chain survey, triangulation & instruments for ranging, offsetting.
4. Calculation of area by method of triangles, Simpson rule, by planimeter, digital plan meter.
5. Introduction to prismatic compass & its uses. (theoretical importance)
6. Introduction to plane table survey (instruments & methods)
7. Leveling instruments & methods to calculation levels, concept of contours & its uses its characteristics & introduction to theodolite.
8. Uses of photographic surveying & concept of GPS.
9. Introduction to advance instruments like digital plan meter, digital theodolite, automatic level, radiation survey method, environmental survey instruments, digital distance meter, etc
10. Line out of simple residential building plan Identity of different types of foundation strata by inspection (site visit)

Field book:-

1) Recording of chain survey 2) Application of prismatic compass 3) Sign conventions for various objects (symbols) 4) Area measurement by planimeter 5) Leveling instruments 6) Application of theodolite.

Drawing sheets:-

- 1) Close traversing of building by compass 2) Planimeter 3) Block contouring 4) Plain table survey sheets

Reference Books :

1. Surveying –B. C. Punmia,, S.K.Jain, Vol. I and II, Laxmi Publication, New Delhi
2. Surveying and Leveling – T. P. Kanetkar and S. V. Kulkarni Vol.I and II , -Pune Vidyarthigriha Publication
3. Surveying – K. R. Arora Vol. 1 and 2
4. Surveying and Leveling –N.N. Basak, Tata McGraw Hill Publishing Co., New Delhi

ENVIRONMENTAL STUDIES

Note - As per solapur university instructions

Objectives:

1. Nature of Environmental Studies
2. Natural Resources and Associated Problems
 - a) Forest resources:
 - b) Water Resources:
 - c) Mineral resources
 - d) Food resources:
 - e) Energy Resources:
 - f) Land resources:
3. Eco System
4. Bio Diversity and its conservation
5. Environmental Pollution
6. Social issues and the Environment
7. Environmental Protection

Reference book :

Environmental Studies – by Ninad .C. Shah