



FACULTY OF ARCHITECTURE
(A constituent college of Manipal University, Manipal)
Manipal Karnataka 576 104

COURSE PLAN
Architectural Design and Detailing

Subject : ARC - 14 – 201 Architectural Design & Detailing - III
Semester & branch : 3rd SEMESTER, B.ARCH.
Name of the faculty : SMA, SV, RS, ACK, KCMK, DMK, UC, SH, AS JG, PK, JBJ
No of contact hours/week : 10hrs

Internal Marks Weightage		Weightage 100 marks
Assignment no.	Topic	
1	Introductory Exercise	10
2	Minor Exercise	20
3	Exploratory Exercise	10
4	Major Exercise	60

Submitted by:

Sec A:

Roshan Shetty,
Shruti M Aiholli,
Shama Vazid

Sec C:

Ujjwala Chourasia
Surabhi Hebbar
Amit Shenoy

Sec B:

Amit Kinjawadekar
Kala Choyimanikandiyil
Dakshath Kidiyoor

Sec D:

John Benette John
Jincy George K
Prajosh Kumar

Date:

Approved by:

(Signature of Director)

Date: 19.7.16

COURSE PLAN : ARC - 14 - 201 : Architectural Design & Detailing - III													SEM: III			
Week	Topics to be conducted	Assignments for learning (Weightage in %)					Intended Learning Outcome					Units	No. of Hours			
1	Compilation of 2nd Semester's Portfolio; Introduction to theme of semester; Introduction to Minor Exercise.	Portfolio Submission (10%)					Conceptual Development of Design							10		
2	Portfolio submission; Discussion and finalization of Minor project.		Minor Project (20%)					Exploration and application of design							10	
3	Presentation of Minor exercise; Introduction to Major Design Project; and site.			Exploratory Exercise-literature, case study, site documentation (5%)						Understanding of contoured site and designing on them.						10
4	Submission of Minor Project; Discussion on Literature Study and review; Site visit										Application of data analysis					10
5	Documentation on Site; Area programming and design guidelines													10		
6	Design Case Study Trip															
7	Presentation: Case study ; Area programming	Presentation : Case studies		Literature study, case study (5%)	Data analysis (5%)		Learning from variety of live and secondary case studies						10			
8	Concept Development; presentation of site analysis; submission of literature and case study	Concept: Zoning: Module development					Context oriented design development							10		
9	Finalization of Zoning and schematic plan		Zoning: schematic plan					Arrangement of activities on macro and micro scales	Interaction with Countours					10		
10	Design Development 1: Site development and design			interaction with countours											10	
11	Intermediate Jury (10%)												10			
12	Design Development 2		(5%)	Incorporation of user activities and site services	Development of site and unit design based on inputs from jury				Incorporation of user activities and site services	Overall design at project scale	Detailing at project scale		10			
13	Design Detailing					Detailing (10%)										10
14															10	
15		Prefinal Jury (10%)													10	
16	Other drawing subjects submissions															
17	ADD Week / Final Submission (20%)															

Note: Improvement beyond the first intended week of respective assignments, is subject to evaluation on the said first intended week itself. In case of absence of student in that week, or non-submission, no consideration for improvement will be permitted.

Marking for Improvements: 50% of marking for each assignment shall be frozen in the first intended week of evaluation. Any further improvements, only upto the designated period as shown, will be marked for 50% of allotted marks.

FACULTY OF ARCHITECTURE

Manipal University

COURSE PLAN

Subject : **ARC - 14 – 203 : STRUCTURAL & CONSTRUCTION SYSTEMS – III. (SCS – III)**

Semester & Branch : **3rd Semester, B. ARCH**

Name of the Faculty : **RNR, TAK, SMA, SV, KCMK, DMK, UC, AS, JBJ, PK**

No of contact hours/week : **6 Hours/Week**

Marks distribution details :

Sl.No:	ASSIGNMENTS	WEIGHTAGE
1.	Assignments including tutorials	60%
2.	Sessionals	20%
3.	Integration	20%

Submitted by:


Er. Ramaswamy .R.N

&


Ar. John Benette John

(SCS – III – Subject Coordinators (2016 – 2017))

Approved by:


19.7.16

Prof. Nishant H. Manapure
Director, FOA, MU.

FACULTY OF ARCHITECTURE

Manipal University

SCS – III : Detailed COURSE PLAN

Sl. No:	Week	Unit	Topics to be covered as per syllabus 2014	Topics to be covered	Intended Outcome	Assignments for Learning	Templates to be done on	Hrs/wk	Marks
1.	1	1	- Fundamentals of RCC. - History & Evolution of Concrete. - Grade of Concrete. & Steel. - Tests for Concrete. (Notes/PPT/Deliverables to be prepared by:) RNR, TAK (Structures) JBJ, PK (Arch.)	- Support reactions. - Determinate & Indeterminate structures. - Shear force and Bending moment diagrams for typical loading cases & Use of these diagrams in RCC beams. - Different loading cases in buildings. - Concrete & Ingredients used, - Advantages & Disadvantages of concrete. - Preparation of concrete: Batching/proportioning, Mixing, Transporting, Placing, Compacting and Curing. - Workability of concrete, factors affecting workability, methods of finding workability. - Strength of concrete, e.g. M15, M20, M25, etc. Factors affecting strength of concrete. - Design mix. - Tests on concrete. Lab visit	Basic understanding about the material	Evolution & History of Concrete.	- Advancements in Concrete Technology. (Collage Making of any one tech. - Tests of Conc. ie. Slump Test & Compressive Strength Test Report	6	10

Notes:

- Responsibilities of making notes/PPT to all the concerned faculty members are equally distributed.
- The prepared notes/PPT should be circulated to all section faculty members, so that the deliverables will be uniform in all classes.
- Structural details & related assignments in all topics will be formulated by Structures Faculty & Arch. Details & related assignments will be formulated by Arch. Faculty.
- Model making of each RCC building components may be asked to make by the students for their better understanding.
- Detailed course Plan is prepared by RNR & JBJ with the approval of Director, FOA.

2.	2	1	- Reinforcements in RCC Structures. - Overview of Advancements of Conc. Technology. RNR, TAK (Structures) JB, PK (Arch.)	- Admixtures, - Different types of concrete and their uses. - Stress & strain, Working load, Factored load, Working Stress & Limit state method. - Shear and Bending stresses, compound bars or composite sections, - Analysis & Design with simple examples	Understanding the behaviour of different structures under various cases of loading.	Problems on shear force and bending moment for determinate & indeterminate structures using 'SAP'	- Sketches of stresses, bending moment of given problems on sheet. - Sketches on different possible built forms in RCC	6	10
3.	3	1	Study on FORMWORKS RNR, TAK (Structures) SMA, SV (Arch.)	- On various RCC components. - Columns. - Beams. - Slab. - Shell. - Stairs.	Understanding of various form works used.	Site visit, Sketching of form works	Sketches of formwork for column, beam, slab, shell, stairs, report on material used in formwork	6	10
4.	4	4	Introduction to RCC. & Building Components in RCC structures : FOUNDATIONS - Footings RNR, TAK (Structures) KCMK, DMK (Arch.)	- Design philosophies, - Working stress & Limit state methods, - Balanced, Under reinforced and Over reinforced sections, - Moment of resistance - Intro. To the Building Component : FOUNDATIONS/FOOTINGS: - Shallow foundations. - Isolated, - Combined, - Raft/Mat	Understanding the detailing of various types of footing, circumstances under which they are preferred.	Detailing of various kinds of footings	Drafting of footings, plans, sectional elevation, views. Types: Shallow Isolated, Combined, Raft foundations	6	10
5.	5	ADD Study Tour							
6.	6	4	DEEP FOUNDATIONS RNR, TAK (Structures) UC, AS (Arch.)	- Overview of Deep Foundations & Shear Walls. - Design considerations for Deep Foundations and Shear Walls	Understanding the various types of Deep foundations	Detailing of deep foundations and shear walls	- Drafting of deep foundations, Plans, Sections. Types: Pile (end bearing, friction), shear wall. - Sketches of details for pile foundations.	6	10

7.	7	4	COLUMNS RNR, TAK (Structures) SMA, SV (Arch.)	• Types of Columns. • RCC column design for various cases of loading, construction procedure. • Analysis & design of axially loaded short columns & isolated shallow footings.	Understanding detailing of RCC columns of various cross sections.	• Detailing of RCC columns of different cross sections.	• Drafting of columns plan, section and views. Types: Rectangular, Circular, L-shape, any other shape.	6	10
8.	8	2	BEAMS RNR, TAK (Structures) KCMK, DMK (Arch.)	• Types & Concept • Analysis & design of Singly reinforced, Doubly reinforced sections, T sections, continuous beams. • Reinforcements for ductile detailing. • BIS Codes.	Understanding the detailing of RCC beams and their selection criteria	• Detailing of singly reinforced doubly reinforced RCC beams for simply supported and cantilever conditions. Detailing of Continuous Beams	• Drafting of beam sections, views. Types: singly and doubly reinforced, cantilever, continuous, T-beam	6	10
SESSIONAL - I									
9.	9	1	• Introduction to CYPECAD. RNR, TAK (Structures)	• Its use in analysis of RC section.	Understanding the detailing of RCC with the help of software.	• Practice of CYPECAD for beams and slabs		6	10
10.	10	3	SLABS RNR, TAK (Structures) UC, AS (Arch.)	• Analysis & Design of one way slabs. • Reinforcement detailing. • BIS Codes. • Introduction to 2-way slab	Understanding the detailing of one way and two way slab	• Detailing of one way and two way slab under various edge conditions	• Drafting of slab plan, 2 sections. Types: One-way, 2-way, Continuous & Cantilever.	6	10
11.	11	3	SLABS RNR, TAK (Structures) SMA, SV (Arch.)	• Analysis & Design of 2- way slabs. • Reinforcement detailing. • BIS Codes.	Understanding the detailing of coffer slabs, flat slabs and their types.	• Detailing of coffer slab, flat slab	• Drafting of slab plan, 2 sections, sketch view. Types: Coffered slab, Ribbed slab, Flat slab (2types)	6	10
12.	12	5	STAIRCASES RNR, TAK (Structures) KCMK, DMK (Arch.)	• Design of staircases. • Types of Staircases: • Waist slab stairs. • Folded slab stairs.	Understanding the detailing of stair cases of different configurations and their selection	• Detailing of stair cases of various configuration	• Drafting of plans, sections. Types: Waist slab stairs, Folded slab stairs	6	10



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COURSE PLAN
ARCHITECTURAL REPRESENTATION- III

Subject : Architectural Representation- III
Semester & branch : 3rd SEMESTER, B.ARCH.
Name of the faculty : PB, STD, MJ, SH, NN, RTS, KM, JG
No of contact hours/week : 5 hours/week

Assignment portion		
Assignment No	Topics	Weightage
1.	AUTOCAD	40%
2.	SKETCH UP	30%
3.	PHOTOSHOP	15%
Test portion		
Test no.	Topics	
1.	AUTOCAD AND SKETCH UP	15%

Submitted by:

Sec A:
PREETHI .B
SIDDHARTH.T

Sec B:
SURABI HEBRAR
MONIKA JADHAV

09/08/16

Sec C:
NISHKALA .N
RITU

Sec D:
KAILAS.M
JINCY GEORGE

Date:
09-08-2016

Approved by:

(Signature of Director)

Date: *09.8.16*

week	Topics to be covered	Assignments for learning	Intended outcome	No. of hours
1	Course overview and introduction to AutoCAD software	Software basics	Understanding the basics	5
2	Introduce commands for creating shapes; Edit/Modify commands	Exercise 1 - Drawing lines, rectangles, circles, lines, erasing objects, trimming, extending, fillets, offsetting	Learning to use various commands on the given drawing	5
3	Text & hatching Layers and Dimensions	Exercise 2 - Adding text, modifying multiline text, hatching & editing hatches Types of dimensions, adding layers.		5
4	Architectural views & drafting Views	Exercise 3 - Drafting plan, elevation, and sections of a simple 1bhk house.		5
5	Templates & design center, Blocks, Drafting symbols	Exercise 4 - Introduction of available templates and design center – 2bhk	Application of blocks and templates available in design center.	5
6	Extracting data, Plotting (Layouts, Viewports) Office standards & preparation of presentation drawings	Exercise 5 – Create different output files (PDF, JPEG, Direct printing) plotted with the use of Layouts and viewports.	Basics of layouts and plotting	5
7	Introduction to 3D software – SKETCH UP	Software basics	Understanding the basics	5
8	3D Modelling: Using 3D visualization software Viewing the model in different ways	Exercise 6 - Trying to draft simple floor plans from 2D to 3D. Inserting doors and windows, Modeling stairs, Adding a roof.	Learning to use various commands on the given drawing	5
9		Exercise 7 - Introduction to styles, working with light & shadow, components, section planes, Working with material, colors and material selection and settings.		5

10	Creating 3D compositions Modelling with photographs, Plugins and extensions	Exercise 8 - Importing Other software files and modeling over it. (PDF, CAD, Images). Downloading the available models from warehouse.	Learning to use various commands on the given drawing	5
11	Rendering & Animation	Exercise 9 - Scenes and animation for the model created. Understanding rendering techniques using advanced software (V-ray)	Choosing appropriate materials and textures used for rendering	5
12	EXAM – AutoCAD and Sketch up			5
13	Photoshop – introduction and basics of Photoshop, image adjustments, color correction, text, filter and effects	Exercise 10 – Rendering the previously worked plan on Photoshop. Understanding the composition of sheets	Importing the plan, scaling, Using templates, drag and drop photos, etc.	5
14	Basic drawing with the pen tool, layers, palettes		Rendering the given plan defining spaces, materials, textures and opening, furniture. Composing	5

Faculty.

Section A - Preethi.B - *Preethi.B* 09/08/16
Siddarth.T -

Section B - Monika.T - *Monika* 09/08/16
Surabhi.H - *Surabhi.H* 09/8/16

Section C - Nishkala.N - *Nishkala* 09/8/16
Rithu.S -

Section D - Kailas.M - *Kailas.M* 09/8/16
Jincy.G -

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COURSE PLAN

Subject : **ARC - 14 - 207: Building Services II**

Semester & Branch : **3rd Semester, B. ARCH**

Name of the faculty : **ACK, RS, JBJ, UC**

No of contact hours/week : **3 Hours/Week**

Marks Distribution Details:

1.	ASSIGNMENTS	Weightage
	ASSIGNMENT 1, 2, 3	15%
2	TUTORIALS	10%
3.	SESSIONALS	
	SESSIONAL I (INTERACTIVE SESSIONAL - GROUP WORK)	20%
	SESSIONALS II (END SEMESTER EXAMINATION PATTERN)	30%
4.	INTEGRATION	
	DESIGN RELATED BUILDING SERVICES DETAIL	25%

Assignment Details:

No.	Assignments	Introduction	Intermediate discussion	Submission	Weightage (%)
1.	Illumination (Case Study Analysis & Market Survey)	1 st Week	3 rd Week	4 th Week	5
2	Building Electrification (Case Study Analysis)	6 th Week	8 th Week	10 th Week	5
3.	Mechanical Transport Systems (Case Study Analysis)	11 th Week	-	14 th Week	5
4.	Tutorials	To be given after completion of each unit.		Week after	10
5.	Integration Sheets	14 th Week	15 th Week	18 th Week	25

Submitted by:

ACK

RS

JBJ

UC

Date : 7th July, 2016

Approved by:

Prof. Nishant H. Manapure,
Director, FOA, MU.

Course Objectives:

To understand the working of electrical, illumination, mechanical transportation systems and fire fighting services in buildings and their integration in design.

Course Contents:

UNIT I - Artificial Lighting: Fundamentals; Behavior of light; Quality, light quantity; Lamps & luminaires - characteristics, selection criteria, lumen method; Interior & exterior lighting; Preparation of lighting schemes; Best practices, codes; Case studies.

UNIT II - Building Electrification I: Power generation & transmission; Characteristics; Basics of electrical circuit - lighting & power circuit; Conductor, cables, controls & other components; Wiring methods; Accessories - switches, meters, fuses, circuit breakers, distribution boards.

UNIT III - Building Electrification II: Basic quantification; Electrical drawing, symbols; Power requirement of building - low, medium & high rise buildings; Load estimation; Building substation, transformer, HT, LT units - space requirements, safety measures; Earthing, lightning arrestors; Stand-by power, alternate power; Regulation as per - NBC & other IS codes.

UNIT IV - Mechanical Transport Systems: Elevators - passenger & service, parking; Escalators - basic components, working & operation, types; Travelators; Conveyer belts; Elevator planning fundamentals; Performance indicator, location & arrangement; Installation related civil works; NBC regulations; Current trends; Illustrations & drawings; Case studies.

UNIT V - Fire Fighting & Life Safety: Basic principles, elements & terminologies; Fire-fighting in different building typologies - prevention, evacuation strategies, suppression measures; Fire-fighting services & planning; NBC standards - Fire safety codes & regulation; Primary & secondary case studies.

SITE VISITS:

Adequate site visits/case studies related to the above mentioned topics, nearby.

INTERACTIONS:

Interactions with well qualified and experienced professionals/experts from the concerned fields.

References:

- Stein/Raynolds and Mc Guinness. (1996). Mechanical and Electrical Equipment for Buildings, Vol. 1. John Wiley and sons, MY.
- Egan, David M. (1983). Concepts in Architectural Lighting. McGraw Hill Book Company.
- Dagostino, F. R. (1978). Mechanical and Electrical Systems in Construction in Architecture. Reston Publishing Company, Prentice Hill Co., Virginia.

SCHEDULE OF WORK

Week	Units	Topics
1	Unit – I Illumination	Introduction to course content. Illumination: Lighting Fundamentals; Functional and Architectural Considerations in Illumination Design for Built Environment; Behaviour of light & light quantity.
2		Artificial Lighting: Concepts (brief about Comparative Assessment of day lighting & artificial lighting), considerations for artificial lighting; Different types of indoor and outdoor lighting; Lamps & luminaires – Definitions, classification systems, Lamp sources. Types – Operation characteristics and application; Selection criteria.
3		Lumen method; Interior & exterior lighting; Concept of Illumination Requirement For Various Building Types- Residence, Office, Schools, Hospitals, Commercial Spaces, Restaurants Etc., Energy Efficient Systems And Components Of Lighting (Smart Homes), Preparation of lighting schemes; Best practices, codes; Case studies.
4	Unit – II Building Electrification I	Building Electrification I: Electrical Services: Sources of electrical energy supplied to buildings, scope and requirements. Electrical Power – Electrical distribution systems, Electrical wiring systems - Cable Selection Criteria, Conduits – Rigid ,Flexible , Raceways Bus Ways
5		ADD Tour
6		Power generation & transmission; Characteristics; Basics of electrical circuit - lighting & power circuit; Conductor, cables, conduits, controls, insulators & other components;.
7		Wiring methods; Accessories - switches, meters, fuses, circuit breakers, distribution boards
		Sessional – I
8	Unit – III Building Electrification II	Building Electrification II: Service Equipments: Transformers, Switch gear, Safety equipment (Circuit breakers, ELCB, MCB etc.). Fire Safety consideration in electrical design and installation; Safety measures.
9		Basic quantification; Electrical drawing, symbols; Power requirement of building - low, medium & high rise buildings; Load estimation; Building substation, transformer, HT, LT units - space requirements, safety measures; Earthing, lightning arrestors; Stand-by power, alternate power; Regulation as per - NBC & other IS codes.
10		Spatial consideration for transformers, generators; Energy Management in buildings – Electrical wiring diagrams, preliminary cost estimation.
11	Unit – IV Mechanical Transport Systems	Mechanical Transport Systems: Concept of mechanised transportation systems; Study and design considerations of elevators. - Elevators – Types, basic components, working & operation, Detailing Spatial requirements for elevator shafts and lobby; Design considerations, Code and standards; machine room
12		Escalators - basic components, working & operation, types, spatial requirements, Detailing Travelators; Conveyer belts; Elevator planning fundamentals; Performance indicator, location & arrangement; Installation related

		civil works; NBC regulations; Current trends; Illustrations & drawings; Detailing, Case studies.
13	Unit – V Fire Fighting & Life Safety	Fire Fighting & Life Safety: Basic principles, elements & terminologies; Fire-fighting in different building typologies - prevention, evacuation strategies, suppression measures; Fire-fighting services & planning; NBC standards – Fire safety codes & regulation; Primary & secondary case studies.
14	Design related building services details - Discussion	
15	Design related building services details - Discussion	
16	Drawing Subject Submission	
17	ADD Week	
18	Submission of Integrated Sheets	

References:

- Stein/Raynolds and Mc Guinness. (1996). Mechanical and Electrical Equipment for Buildings, Vol. 1. John Wiley and sons, MY.
- Egan, David M. (1983). Concepts in Architectural Lighting. McGraw Hill Book Company.
- Dagostino, F. R. (1978). Mechanical and Electrical Systems in Construction in Architecture. Reston Publishing Company, Prentice Hill Co., Virginia.

Assignment Plan

ASSIGNMENT 1: Case Study & Market Study for Illumination (Area of the case study – 50 sqm)

GROUPS: Maximum 4 Students in a group

FORMAT:

- Compiled Report (Any size, innovative ideas by students are appreciated)
- Representation - 75 % Sketches, 10% Photographs, 15% Writing

TYPES: (one per group)

1. Residence
2. Office
3. Schools
4. Hospitals
5. Commercial Spaces
6. Restaurants
7. Gym/ Sports Complex

ASPECTS TO BE STUDIED IN EACH CASE STUDY:

- Basic concept/ characteristic of illumination.
 - Study of different spaces and its illumination requirement (quantity and quality of illumination)
 - Study of the illumination standards.
 - Critical Analysis wrt illumination.
 - Market Study and latest innovations available in market (collection of samples, brochure, cost of installation etc.)
-

ASSIGNMENT 2: Case Study for Building Electrification System

GROUPS: Maximum 5 Students in a group

FORMAT:

- A1 sheets/ model (innovative ideas by students are appreciated)
- Representation - 75 % Sketches, 10% Photographs, 15% Writing

TYPES:

1. Institutional complex
2. Residential complex
3. Hotels
4. Hospitals
5. Shopping Mall

ASPECTS TO BE STUDIED IN EACH CASE STUDY:

- Study from substation level to building level
- Details of the Service Equipment
- Space requirement

- Fire Safety consideration in electrical design
 - Important points from NBC & other IS codes
 - Electrical Layout of one floor as per BIS
 - Basic calculation of Load Estimation
-

ASSIGNMENT 3: Study of Elevator & Escalator System in a building

GROUPS: Maximum 5 Students in a group

FORMAT: A1 sheets (innovative ideas by students are appreciated)

a. Case Study of Elevators

(Select any high-rise building having elevators – example: FOA building, AB5, MARENA etc.)

Aspects to be studied:

- Type
- Basic Components
- Working & Operation
- Detailings
- Spatial Requirements & Design Considerations
- Code And Standards
- Load Estimation

b. Case Study of Escalators

(Select any building having escalators – example: Big Bazar Complex etc)

Aspects to be studied:

- Basic Components
 - Working & Operation
 - Types
 - Spatial Requirements
 - Detailings
-



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COURSE PLAN FOR THEORY SUBJECTS

Subject : History of Built Environment-III [ARC -14-209]
Semester & branch : 3rd SEMESTER, B.ARCH
Name of the faculty : Shalini Singh, B Sneha Singh, Kailas M, Shriharsh Dixit
No of contact hours/week: 2 hrs. (TWO HOURS) EACH SECTION

ASSESSMENT CRITERIA	
ASSIGNMENTS	3 ASSIGNMENTS OF 5 MARKS EACH(15 MARKS)
SESSIONAL -1	10 MARKS
SESSIONAL -2	25 MARKS

Submitted by:

Shalini Singh

B Sneha Singh

Kailas M

Shriharsh Dixit

(Signature of the faculty)

Date: 19.08.16

Approved by:

(Signature of HOD)

Date: 20.8.16

Syllabus

UNIT I - Ancient India: Indus Valley Civilization - residences & various public buildings; Vedic villages - e.g. Kaushambi; Mauryan Period - e.g. Pataliputra; Establishment of Buddhist school, its significance & contribution; Ashokan Architecture & edicts; Beginning of cave architecture - e.g. Barabar hills

UNIT II - Buddhist Architecture & Rock Cut Architecture: Stupas - e.g. Sanchi & Amaravathi; Rock cut Temples; Chaityas & Viharas - e.g. Bhaja, Karle, Kanheri, Ajanta & Ellora.

UNIT III - Evolution of Temple Architecture: Early Gupta & Chalukyan temples - rock cut, shrines, defined temple form; Early Gupta - Udaygiri caves, early temples at Sanchi & Tigawa, temples at Deogarh & Bhattargao; Early Chalukyan: Temple form at Aihole - e.g. Lad Khan & Durga temples; Elements of Indo Aryan (Nagara) temples; Basic elements of a Hindu temple & different temple styles such as Latina, Valabhi, Shekhari, Phamsana & Bhumiya.

UNIT IV - Nagara Temples of Kalinga (Odisha) & Chandela (Madhya Pradesh) Dynasties: Kalinga - Types of Deulas - e.g. Mukteshwara, Lingraj, Jagannath & Sun temple at Konark; Chandela - Principles of shikhara & urushringa; Overview of Khajuraho group of temples; Kandariya Mahadev at Khajuraho.

UNIT V - Solanki & Jain Architecture: Solanki (Gujarat, Rajasthan & parts of Central India) - e.g. Saas Bahu temple at Gwalior & Sun Temple at Modhera; Jain Temples - e.g. temples at Ranakpur & Mt. Abu; Gujarat - Adalaj, Palitana, Somnathpur; Architecture of Rajasthan - Jaipur, Udaipur, Jodhpur, Jaisalmer, Bikaner; Forts, palaces, public buildings & town planning.

Week	Topics to be covered	Assignments for learning	Intended Outcome	Units	No. of Hours
	TIME LINE OF INDIAN ARCHITECTURE				
	INDUS VALLEY CIVILISATION				
1	• Introduction • Influences • Characteristics • Settlement pattern • Examples such as The great bath, The granary	Sketches (Class Work)	Knowledge base: Be able to demonstrate familiarity with timeline and parallel history. Evolution of major concepts, theories and their relevance to geographical context.	1	2
	VEDIC CIVILISATION				
2	• Vedic culture • Vedic village • Primitive forms of Chaitya & Vedika • Wooden architecture	Sketches (Class Work)		1	2
	MAURYAN DYNASTY				
3	• Introduction • Early Mauryan Architecture • Advanced Wooden Architecture • City of Pataliputra & Kaushambi • Ashokan Architecture, Beginning of cave architecture - e.g. Barabar hills	Model (Class Work)	Understand and Analyze the work of architecture in relationship with time, society, functionality and arts.	1	2
	BUDDHIST ARCHITECTURE				
4	• Introduction-Establishment of Buddhist school • Overview of Stupas, Chaityas & Viharas • Introduction to Hinayana & Mahayana • Buddhist architecture under Sungas & Andhras	Sketches (Class Work)		II	2
5	Sessional I Design Study Trip				
	BUDDHIST ARCHITECTURE				
6	• Stupas At Sanchi, Amaravati, Sarnath • Overview Of Rock Cut Architecture • Evolution Of Chaitya Halls • Chaitya Halls At Karli, Bhaja & Kondane	Sketches (Class Work)	Understand the construction Techniques and Systems, Craftsmanship and its characteristics. Understand the relevance of daily routine practices to spatial configurations.	II	2
	BUDDHIST ARCHITECTURE				
7	• Buddhist Viharas • Ajanta & Ellora caves	Sketches (Class Work) + Model		II	2
	EVOLUTION OF TEMPLE ARCHITECTURE				
8	• Introduction-Need for temples, Concepts like aedicules etc. • Gupta Period • Badami, Aihole • Early Chalukyan Temples	Sketches (Class Work)	Understand the vocabulary varying regionally, understand the construction system, Understand the traditions identities attached with temples which should be brought forward to contemporary temple construction practices.	III	2
	EVOLUTION OF TEMPLE ARCHITECTURE				
9	• Development of Architectural Features & Styles accordingly • Vocabulary For temples and their cultural identities	Sketches (Class Work)		III	2
	INDO ARYAN STYLE , ORISSA				
10	• Introduction • Characteristics • Examples of Mukteshwar, Vittal, Lingraj, Puri Jagannath & Konark	Sketches (Class Work) + Model	Understanding the related traditional knowledge systems. Understand the generic characteristics and variations in context of their location and cultural identity.	IV	2
	INDO ARYAN TEMPLES AT KHAJURAHO				
11	• Introduction • Influences • Characteristics, philosophies involved.	Sketches (Class Work)		IV	2
	INDO ARYAN TEMPLES AT GURJAT				
12	• Introduction • Influences • Characteristics • Temple At Modhera	Sketches (Class Work)	Understand and Analyze the work of architecture in relationship to time, society, functionality and arts.	V	2
	INTRODUCTION TO JAIN ARCHITECTURE				
13	• Introduction • Temples at Mount Abu • Temples at Ranakpur	Sketches (Class Work) + Model		V	2
14					
15	ADD Week				
16					
17	Sessional II				
18	Submission Week (Drawing subjects)				

ASSIGNMENT PLAN : Subject Name						SEM:
Week	Assignment Brief	Assignment Deliverables	Work Space (class hours/ after class hours)	Medium of Presentation	Weightage (%)	Submission Date / Week
1	Introductory exercise on planning principles brief on parallel history	Sketches		Sketchbook		
2	Assignment to illustrate the building typologies of the time period (Vedic Civilization)	Sketches		Sketchbook		
3	Construction techniques involved with wooden	Sketches + Model		Physical Model	5%	4th Week
4	Sketches (Buddhist Architecture)	Sketches		Sketchbook		
5	Sessional I					
	Design Study Trip					
6	Sketches (Buddhist Architecture)	Sketches		Sketchbook		
7	Sketches (Buddhist Architecture)	Sketches + Model		Physical Model	5%	8th Week
8	Sketches (Temple Architecture)	Sketches		Sketchbook		
9	Sketches (Temple Architecture)	Sketches		Sketchbook		
10	Sketches (Temple Architecture) + Model	Sketches + Model		Physical Model		
11	Sketches (Class Work)	Sketches		Sketchbook		
12	Sketches (Class Work)	Sketches		Sketchbook		
13	Sketches (Class Work) + Model	Sketches + Model		Physical Model	5%	14th Week
14						
15	ADD Week					
16						
17						
18						
	Submission Week (Drawing subjects)					
Kindly note for theory subjects:	Highlight the week which has assignments scheduled and show the others as Nil					
	The Sessionals and Assignments should comprise of all the units as per syllabus.					
	Total of Three Assignments of 5 marks each					
	Sessional-I (Interactive sessional - group work) - 10 marks					
	Sessional-II (End semester examination pattern) - 25 marks					
Kindly note for studio subjects:	Highlight the week which has assignments scheduled and show the others as Nil					
	The details of assignments should be formulated as per the detailed course plan					
	Submission of assignments for all drawing subjects should be completed and submitted on the same day of the class					
	SCS /BCM time test (during class hours) for eg: model making, theory application, sheet work etc					
	AR time test (during class hours) for eg: sheet work, models, compositions etc.					
Kindly note for drawing subjects:	Highlight the week which has assignments scheduled and show the others as Nil					
	The details of assignments should be formulated as per the detailed course plan					
	ADD time test (during class hours) for eg : developing sections/ elevations, double line plan etc					



DEPT. OF DESIGN
FACULTY OF ARCHITECTURE
Constituent Institute of Manipal University, Manipal

COURSE PLAN

Subject : ARC -14-211: PRINCIPLES OF CLIMATIC DESIGN
Semester & branch : III Sem. B. Arch.
Name of the faculty : SHRUTI M. AIHOLLI (A SEC), KALA CMK (B SEC),
SURABHI HEBBAR (C SEC), JINCY GEORGE K (D SEC)
No of contact hours/week : 2 Hrs/Week

Sl. No.	TOPICS	WEIGHTAGE
1.	Internal examination weightage	50%
2.	External examination weightage	50%
INTERNAL ASSIGNMENT PORTION		
Assignment no.	TOPICS	
1.	Assignment on low energy projects in India	5%
2.	Assignment on energy simulation software	5%
3.	Integration with ADD-3	15%
TEST PORTION		
Test no.	TOPICS	
1	Sessional -1(Interactive sessional - group work)	10%
2	Sessional -2 (End semester examination pattern)	15%

Submitted by:

SHRUTI M. AIHOLLI

KALA CMK

SURABHI HEBBAR

JINCY GEORGE K

Date: 16/07/2016

Approved by:

(Signature of Director)

Date:

ARC - 14 - 211 : Principles of Climatic Design : [2-0-0-2/ 30 hours]

Course Contents:-

UNIT I- Introduction to climatic design: Energy use & its implications. Introduction to various elements of climate & their impact on global, local, site & building context. Introduction to Micro (site) climate – effects of local factors, Landscape elements & any other elements in site. Introduction to urban heat island effect.

UNIT II- Impact of climate on design: Climate classifications in India. Study of climate conditions on a macro & micro level. Understanding climate zones & their influence over design guidelines for Warm & humid climate, Hot & dry climate, Composite climate & Cold climate.

UNIT III- Bioclimatic & low-energy design: Understanding the sun path & shading devices, orientation of building, openings- sizes, position. Study of Bioclimatic design & Low-energy design. Examples of Low-energy projects & discussion on solar architecture.

UNIT IV- Integrated passive design: Cooling & Heating: Understanding the psychometric chart. Daylighting & envelope design; Study of different passive cooling & heating strategies in buildings; Ventilation, courtyards, wind towers, stack effect & chimney.

UNIT V- Introduction to simulation software: Introduction to computer simulation for climatic design, software like Climate Consultant, HEED, Ecotect or related advanced software. Design of a space using simulation software with the application of principles of climatic design.

Objectives of the Course:-

- To understand climatic elements as the building context so as to understand the use of surrounding environment as a strategic design parameter with respect to human comfort and energy conservation.

REFERENCE BOOKS:

1. Koenigsberger, et. al. (1975). *Manual of Tropical Housing and Building (Part-II)*. Climate Design, Orient Longman Ltd, Hyderabad
2. Brown, G. Z. (1985). *Sun, Wind and Light: Architectural Design Strategies*. John Wiley & Sons, New York.
3. Evans, Martin. (1980). *Housing, climate and comfort*. Architectural Press, London.
4. Mani, A. (1980). *Handbook of Solar Radiation Data for India*. Allied Publishers, New Delhi.
5. Olgyay, A. and Olgyay, V. (1957). *Solar Control and Shading Devices*. Princeton University Press, New Jersey.
6. Robbins, C. L. (1986). *Daylighting: Design and Analysis*. Van Nostrand Reinhold Co.

ARC 214 – PRINCIPLES OF CLIMATIC DESIGN				SEMESTER III		
Week	Topics to be covered	Assignments for learning	Assignment Deliverables	Intended Outcome	Unit	No. of Hrs
1	Introduction to subject and course plan. Introduction to climatic design: Energy use & its implications.	NIL			1	2
2	Introduction to various elements of climate & their impact on global, local, site & building context.	NIL			1	2
3	Introduction to Micro (site) climate – effects of local factors, Landscape elements & any other elements in site. Introduction to urban heat island effect.	NIL			1	2
4	Impact of climate on design: Climate classifications in India. Study of climate conditions on a macro & micro level.	NIL			2	2
5	Understanding climate zones & their influence over design guidelines for Warm & humid climate, Hot & dry climate.	NIL			2	2
6	DESIGN TOUR					
7	Understanding climate zones & their influence over design guidelines for Composite climate & Cold climate.	NIL			2	2
8	Bioclimatic & low-energy design: Understanding the sun path & shading devices, orientation of building, openings- sizes, position.	NIL			3	2
	SESSIONAL I					
9	Study of Bioclimatic design & Low-energy design. Examples of Lowenergy projects & discussion on solar architecture.	NIL			3	2

(Contd.)						
Week	Topics to be covered	Assignments for learning	Assignment Deliverables	Intended Outcome	Unit	No. of Hrs.
10	Integrated passive design: Cooling & Heating: Understanding the psychometric chart. Daylighting & envelope design	NIL			4	2
		To analyze the low energy projects in India(Group)	Sun path, shading devices, orientation of building, openings-sizes & position, psychometric chart, Daylighting, envelope design, Ventilation, and other energy saving	To analyze the strategies used in low energy projects		
11	Study of different passive cooling & heating strategies in buildings	NIL			4	2
12	Ventilation, courtyards, wind towers, stack effect & chimney.	NIL			4	2
13	Introduction to simulation software: Introduction to computer simulation for climatic design, Study of software like Climate Consultant, HEED, Ecotect or related advanced	NIL			5	2
SESSIONAL II						
14	Study of software like Climate Consultant, HEED, Ecotect or related advanced software.	Calculate the energy consumption of a space using energy simulation software	Detailed report about Energy consumption of a building	To use the simulation software as a tool in designing energy efficient building	5	2
15	INTEGRATION WITH ADD					
16						