

COURSE STRUCTURE – FIFTH SEMESTER

S. No.	Paper Code	Paper Title	L (1)	S (1)	P(0.5)	Credits	Marks	ESE (*)	Duration of exam (HRS)
STUDIO COURSES									
1	BAP 301	Architectural Design – V		10	-	10	100	VV	
2	BAP 303	Building Materials & Construction Technology – V		6	-	6	100	VV	
THEORY COURSES									
3	BAP 305	Sociology and Psychology in Architecture	2	-	-	2	100	WR	3
4	BAP 307	History of Architecture - V	2	-	-	2	100	WR	3
5	BAP 309	Structures - V	2	-	-	2	100	WR	3
6	BAP 311	Building Services - III (HVAC)	2	-	-	2	100	WR	3
PRACTICAL SUBJECTS									
7	BAP 313	Research Methodology	-	-	2	1	100	VV	
ELECTIVE COURSES									
8	BAP 315	Sustainable Development							
9	BAP 317	Architectural conservation	-	-	4	2	100	VV	
10	BAP 319	Architectural Journalism							
Total			8	16	6	27			

(*) Please see below for abbreviations:

VV – Viva Voce
WR – Written Test

ARCHITECTURAL DESIGN-V			
Course Code:	BAP-301	Credits:	10
No. of Studio Hrs/Week:	10	Mid Semester Exams Hours:	--
Total No. of Periods:	160	End Semester Exams Hours:	VV

INTRODUCTION

There is a need to observe inclusion of people belonging to diverse social groups through architectural design and the course focuses on sensitizing the students towards the same.

AIM

To develop sensitivity towards inclusion in architecture which takes into account the diverse needs of people of different ages, abilities, socio cultural context etc.

OBJECTIVES

- To develop understanding about building bye laws
- To sensitize students towards resource conservation through design process.
- To develop understanding on how needs and aspirations of diverse user groups will impact the architectural manifestation of the built environment.

LEARNING OUTCOMES

- Ability to design an institutional project considering the statutory provisions and societal issues in the given context.
- Understanding of sensitive and responsive design for perspective of one or more aspects /issues pertaining to society.

PEDAGOGY

- Case studies along with primary and secondary surveys.
- Site restrictions may be imposed in framing design problem
- Models/sketches /perspectives to be included in key submissions for development of communication skills.
- Students may be encouraged to conduct simulations for passive climatic control as a design tool.
- Role plays/internal jury at key stages of design development process
- Outstation/Local architectural tour/site visits may be conducted.

EVALUATION SCHEME

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

<ul style="list-style-type: none"> • Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation) 	50%
<ul style="list-style-type: none"> • End Semester Viva Voce 	50%

CONTENTS

The studio may be theme based, exploring social inclusion through architecture for people across the cross section of society. User group/s for addressing the theme/s could be architecture paradigms for aged and aging, architecture of care, child friendly architecture, social inclusion and architecture, barrier free architecture – experience, quality and access, architecture for poor, etc.

Design problem

Suggestive projects may be Institutional Buildings like Museums, Hospital, Library, educational Institute, NGO Institute, etc. up to 7000 square meter. The design activity may also include as below (but may not be restricted to only these):

- Study of site context, users, building resources, building systems, building services etc
- Case study- National or International
- Designing of service cores / services in the project.
- The design may also explore/ address conditions arising, if the building is to operate nocturnally.
- Students may be encouraged to demonstrate the theme adopted for design studio through any one of a mode, for example through report, estimation, simulations for passive climatic control, drawing, etc, apart from regular design submission.

REFERENCE BOOKS

1. Rasmusson, S.E., "Experiencing Architecture", Chapman and Hall Ltd., 1964.
2. Licklidan, H., "Architectural Scale", The Architectural Press, 1966
3. Smith, P.F., "Architecture and the Human Dimensions", George Baldwin Ltd., 1979
4. Ching. F.D.K., "A Visual Dictionary of Architecture", Van Nostrand Reinhold, 1997
5. Ching. F.D.K., "Architecture Theoretician", Wiley, 2007
6. Fisher, T., "Architectural Design and Ethics: Tools for Survival", Architectural Press, 2008.

BUILDING MATERIALS AND CONSTRUCTION- V			
Course Code:	BAP-303	Credits:	06
No. of Studio Hrs/Week:	06	Mid Semester Exam Hours:	--
Total No. of Periods:	96	End Semester Exam Hours:	VV

INTRODUCTION

This subject gives insights about construction techniques of building components and material application on building components in Reinforced Concrete Cement

AIM

The aim of this course is to familiarize the student with understanding of Reinforced Concrete Cement its properties, uses, construction techniques, and material application.

OBJECTIVE

- To familiarize students with Reinforced Concrete Cement, its properties, its use and application in building.

LEARNING OUTCOMES

- Understand material properties of Reinforced Concrete Cement
- Understand the technical drawings used for Reinforced Concrete Cement construction.
- Analyze the suitability of different spanning system in building.

PEDAGOGY

Classroom teaching is supported by site visit, market survey, preparation of construction drawings and hands on activity.

EVALUATION SCHEME:

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

<ul style="list-style-type: none"> • Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation) 	50%
<ul style="list-style-type: none"> • End Semester Viva Voce 	50%

CONTENTS

Temporary Construction and equipments

- Centering, shuttering and scaffolding – types, criteria of selection, advantages and disadvantages.
- Tools and equipments: Electric hand tools, Vibrators, Pumps, Compactors/Rollers. Earth Moving & Excavation – Dozers, Scrapers, Graders, Shovels, Backactor, Dragline, Trenchers.

- Transportation – Lorries, Trucks, Dumpers, Hoist, Cranes (mobile, static, tower). Concrete mixers and pumps for ready mix concrete.
- Merits/ demerits, precautions, site planning & management issues of all of the above.

Reinforced Concrete Cement as a building material

- Introduction to Reinforced Concrete Cement, Cement, Aggregate, Water and Reinforcement.
- Preparation of concrete mix, formwork, placement, curing, applications, advantages, disadvantages, construction method, problems and remedies.
- Water cement ratio, Curing of concrete Admixtures
- Ferro cement; its properties, usage, advantages and disadvantages.

Spanning System

- Slab: One way slab, two way slab, and coffer slab, Filler Slab
- Flat roof
- Reinforced brick concrete slab
- Beam: reinforcement details

Distribution System

- Column: Reinforcement Detail, Column and beam joints
- Foundation: shallow and deep foundation, reinforcement details

REFERENCE BOOKS

1. Kumar, S.K., "Building Construction", 19th Ed., Standard Publishers Distributors, 2001
2. Building Construction by B.C. Punmia
3. Rangwala, S.C., "Building Construction", 19 th Ed., Charotar Publishing House. 2001
4. McKay, W.B., Building Construction, Vols. I, Longman. 2005
5. McKay, W.B., Building Construction, Vols. II, Longman. 2005
6. McKay, W.B., Building Construction, Vols. III, Longman. 2005
7. Stulz, Roland and Mukherjee, Kiran, "Appropriate Building Materials" SKAT, 1993.
8. Emmitt, Stephen and Gorse, "Barry's Introduction to Construction of Building", 3rd Edition, Wiley-Blackwell, 2014.
9. Barry, Robbin, "The construction of Buildings", Vol. 1 to 5, Blackwell Science, 1996.
10. Chudley, Roy, "Building Construction Handbook", Routledge; 8 edition, 2010.

SOCIOLOGY AND PSYCHOLOGY IN ARCHITECTURE

Course Code:	BAP-305	Credits:	02
No. of Lectures Hrs/Week:	02	Mid Semester Exam Hours:	1.5
Total No. of Lectures:	32	End Semester Exam Hours:	03

INTRODUCTION

The course deals with the understanding the interrelationship between the social and psychological behavior of people and the built environment.

AIM

To understand social structure and systems existing in our society along with its psychological behavior of people in order to be able to create a more productive and sociologically and psychologically acceptable built environment.

OBJECTIVES

- To study how social aspects impact the design outcomes.
- To make architectural design more sensitive and sensible from the perspective of end user.
- To understand role of architecture in qualitative development of society.
- To explore design as an product of various inter-woven micro and macro level social issues.

LEARNING OUTCOMES

- Understand how social structure / systems impacts the built environment.
- Understand the society at large as a interdependent system.
- Understand psychology of the end user and be able to use it in design.

PEDAGOGY:

Classroom teaching through mutli-media, supported by case studies and social audits.

EVALUATION SCHEME

Continuous assessment by teacher (based on the following) <ul style="list-style-type: none">• Two Class Tests of 15 marks each (to be conducted after 6 weeks and 12 weeks of teaching in accordance with university academic calendar)• Assignments/Group Discussions/Viva-voce/Additional Test/Quizzes/attendance = 10 marks	40%
End Semester Examination	60%

CONTENTS

Unit 1

Sociology

- What is a society , What is sociology and why is it required to study it,
- Globalization, Social interaction and everyday life
- Family Structure: The Environment, families and relationships

- Rural and Urban life and social structure
- Social Communication

Unit 2

Systems in Society

- General understanding of systems like Health, Education, Gender, Migration, Social Stratification, Religion, Media, Crime, Economics, Politics, War , Organizations, Institutions and Networks and their impact on built environment.

Unit 3

Introduction to Psychology

- Nature and scope of psychology; maturation and development; biological bases of behavior.

Unit 4

Social Audit

- Social survey and Social research –principles of social research. Scope of research, units of study, choice of research topics, sources of information
- Identifying a public place and conduct a social audit of the place from the perspective of an architect.

REFERENCE BOOKS

1. Elgin F. Hunt, David C. Colander “Social Science - An introduction to the Study of Society”, Pub. Macmillan Publishing Company, New York 1984.
2. Giddens, Anthony, “Sociology”, Pub. Polity Press in association with Blackwell Publishers, 1989
3. J. Douglas Porteous, “Environment and Behavior - Planning and Everyday Urban Life”, Pub. Addison Wesley Publishing Co, Branding, Massachusetts, 1977.

HISTORY OF ARCHITECTURE V			
Course Code:	BAP-307	Credits:	02
No. of Lectures (Hrs/Week):	02	Mid Semester Exam Hours:	1.5
Total No. of Periods:	32	End Semester Exam Hours:	03

INTRODUCTION

The modern period of Architecture is characterized by development of many new schools of thought and innovations in building design and detailing. The course will help in making students aware of this era of architectural history and its impact on architecture.

AIM

To understand western architecture during the modern period.

OBJECTIVES

- To study social changes and its impact on architecture.
- To study various schools of thought and philosophies of modern architecture.
- To understand the background, development, concept and practice of modern architecture.
- To understand the work of great masters of modern period.
- To understand new materials and techniques those were introduced during the period, and its impact on architecture.

LEARNING OUTCOMES

- Understand evolution of architecture through times.
- understand the impact of social, economic and political changes on architecture

PEDAGOGY

- Classroom teaching through multi-media may be supported by visit to site of historical importance as per syllabus.

EVALUATION SCHEME

Continuous assessment by teacher (based on the following)	40%
<ul style="list-style-type: none"> • Two Class Tests of 15 marks each (to be conducted after 6 weeks and 12 weeks of teaching in accordance with university academic calendar) • Assignments/Group Discussions/Viva-voce/Additional Test/Quizzes/attendance = 10 marks 	
• End Semester Examination	60%

CONTENTS

Unit 1

Various movements in Architecture

- Modernity, Modernization, Modernism, Culture, Territorial & Technical transformations behind Advent of Modern Architecture, Cultural

Transformation Revolutionary Visionary Architects of the time. Impact of Industrial Revolution in Europe - The Social, economic and political changes effected new requirements of the society, new materials and technology developments.

Unit 2

New Materials

- New Materials, Concrete, Iron & Steel and Glass (Eiffels, Hennebique Auguste Perret, Malliart) The Chicago School, Skyscrapers (Louis Sullivan-form follows function, Adler), Organic Architecture (F L Wright- "form and function are one" eg. Falling Water, Prairie style)

Unit 3

Art and Craft movements

- Art and Craft movement (Augustus Pugin, William Morris). Structure Rationalism (Eugene Viollet le Duc). Art Nouveau (Casa Mila- Antonio Gaudi), Art deco (Chrysler Building by William Van Alen), Pavillon de l'Esprit Nouveau (Le Corbusier). Bauhaus (Walter Gropius). De Stijl movement (Mies van der Rohe, Rietveld Schröder House). Modern concept of space, spatial compositions, abstract masses- Alvar Alto, Louis I Kahn (House of Culture, IIM, Ahmedabad, Jatiyo Sangshad Bhavan) Brief introduction to be also given to the students about other important movements like Futurism, Cubism, Purism, Constructivism, Surrealism, Dadaism, Pluralism etc.

Unit 4

Ideas and works of great masters

- F L Wright, Le Corbusier. Oscar Neimeiyer. (Johnson Wax Headquarters, Guggenheim, Villa Savoye, Chapelle of Notre-Dame-du-Haut in Ronchamp, High Court of Justice, Chandigarh, Secretariat Building, Chandigarh, Palace of AsSemesterbly , Chandigarh, Cathedral of Brasília), Deconstructivism (Frank Gehry - Guggenheim at Bilbao, Rem Koolhas – Seattle Central Library, Zaha Hadid - Contemporary Arts Center, Cincinnati, Ohio)

REFERENCE BOOKS

1. Moffet, M., Fazio, M. and Wodehouse, L., "A World History of Architecture", McGraw-Hill, 2008.
2. Fletcher, B., "A History of Architecture", 20th Ed., Butterworth Heinemann, 1996
3. David Smith Capon, John Wiley & Sons, "Architectural Theory, Vol 2, Principles of Twentieth Century Architectural Theory", Chichester, England 2000, (pp.i-xii, 1-140).
4. Ching, Francis D K, "Architecture - Form, Space and Order", Van Notstrand Reinhold, New York. 1996 (For Graphics).
5. Frampton Kenneth, "Modern Architecture: A Critical History", Thames and Hudson. 1985.

STRUCTURES-V			
Course Code:	BAP-309	Credits:	02
No. of Lectures (Hrs/Week):	02	Mid Semester Exam Hours:	1.5
Total No. of Lectures:	32	End Semester Exam Hours:	03

INTRODUCTION

This subject gives insights about structural behavior of building components used in spanning system with Reinforced Concrete Cement. This subject makes students capable of designing building components used in spanning system with Reinforced Concrete Cement.

AIM

The aim of this course is to familiarize the student with understanding of Reinforced Concrete Cement its properties, uses etc., in spanning system.

OBJECTIVE

- To develop quantitative understanding of external forces, internal reaction forces of spanning system
- To develop skill of designing of spanning system using Reinforced Concrete Cement

LEARNING OUTCOMES

- Understand behavior of spanning system in Reinforced Concrete Cement structure.
- Analyze and understand the space and design of building components constructed in Reinforced Concrete Cement
- Analyze the suitability of different spanning system in building.

PEDAGOGY

Classroom teaching is supported by case studies and hand on activity.

EVALUATION SCHEME

Continuous assessment by teacher (based on the following) <ul style="list-style-type: none"> • Two Class Tests of 15 marks each (to be conducted after 6 weeks and 12 weeks of teaching in accordance with university academic calendar) • Assignments/Group Discussions/Viva-voce/Additional Test/Quizzes/attendance = 10 marks 	40%
End Semester Examination	60%

CONTENTS

Unit 1

Design methods

- Introduction to various methods used in Reinforced Concrete Cement analysis design e.g. working stress method, limit state method etc.
- Understanding of Limit state, characteristic strength and characteristic load, partial safety factors, factored loads, Stress strain relationship for concrete & steel, Yield stress, Load & load combination.

Unit 2

Beam analysis

- Introduction, Bending of beam assumption, Modes of failure,
- Maximum depth of neutral axis, moment of resistance of singly reinforced beam, doubly reinforced beam, and flanged beams in Reinforced Concrete Cement using relevant IS codes by working stress method
- Maximum depth of neutral axis, moment of resistance of singly reinforced beam, doubly reinforced beam, and flanged beams in Reinforced Concrete Cement using relevant IS codes by limit state method

Unit 3

Beam design

- Introduction to design of singly reinforced beam and doubly reinforced beam in Reinforced Concrete Cement using relevant IS codes by working stress method
- Introduction to design of singly reinforced beam and doubly reinforced beam in Reinforced Concrete Cement using relevant IS codes by limit state method

Unit 4

Slab and Staircase (Limit State Method)

- Introduction to design of one way slab and two way slab in Reinforced Concrete Cement using relevant IS codes
- Introduction, types of staircase, design of staircase in Reinforced Concrete Cement using relevant IS codes
- Introduction to design of filler slab

REFERENCE BOOKS

1. Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, "Reinforced concrete cement Designs (Reinforced Concrete Structures)", Tenth edition, 2006.
2. S.K.Mallick and A.P.Gupta, "Reinforced Concrete, 6th Edition", Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi, 1996.
3. Dr. Ramchandra and Virendra Gehlot, "Limit State Design of Concrete Structures", Scientific Publishers, 2007.
4. Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi; "Comprehensive RCC Design", Tenth edition, 2006.

BUILDING SERVICES-III (HVAC)			
Course Code:	BAP-311	Credits:	02
No. of Lectures (Hrs/Week):	02	Mid Semester Exam Hours:	1.5
Total No. of Lectures:	32	End Semester Exam Hours:	03

INTRODUCTION

Heating, cooling and ventilation are integral part of any building project and have an impact on thermal comfort of users. The course focuses on understanding of efficient planning and design of heating, cooling and ventilation system in the building.

AIM

To study active and passive modes of heating, cooling and ventilation in buildings, and aspects of energy efficiency related to them.

OBJECTIVES

- To understand conceptual and architectural understanding of mechanical services
- To develop understanding to how to prepare building services drawing.
- To develop understanding of planning of HVAC

LEARNING OUTCOMES

- Understand various HVAC systems and its design.

PEDAGOGY

Classroom teaching is supported by case studies and may be supported by site visits.

EVALUATION SCHEME

Continuous assessment by teacher (based on the following) <ul style="list-style-type: none"> • Two Class Tests of 15 marks each (to be conducted after 6 weeks and 12 weeks of teaching in accordance with university academic calendar) • Assignments/Group Discussions/Viva-voce/Additional Test/Quizzes/attendance = 10 marks 	40%
End Semester Examination	60%

CONTENTS

Unit 1

Envelope Design for Air conditioning

- Introduction, fundamental of psychometric chart and means of heat transfer, physiological effects of air conditioning. Features of Air-conditioning vis-à-vis air cooling. Climate and Requirement of Space Conditioning. Concepts of Adaptive Comfort based Design

- Envelope Design of a Buildings and its various components including walling system including insulation / roofing system including insulation / fenestration design including efficient glazing systems
- Limiting Window-to-wall ratio and appropriate shading

Unit 2

HVAC system

- Air conditioning methods, type and equipments to maintain the atmosphere at required temperature, humidity & cleanliness.
- Means of mechanical ventilation, types of AC's, Blowers and exhaust fans like propeller fan & centrifugal fans system. Relationship of mechanical ventilation system to fire and smoke control.

Unit 3

HVAC designing techniques

- Component of HVAC system, designing, detailing, layout, and space requirements.
- HVAC Plant Room and AHU Design and Planning
- Duct planning and incorporation with other services.

Unit 4

Energy Efficient Air Conditioning Design

- Energy efficient air conditioning systems and technologies. Indoor Air Quality Control, usage of energy simulation software for HVAC systems, say Design Builder
- Active and Passive radiant cooling mechanism, direct and indirect evaporative cooling systems, Air/ water/Ground based cooling systems, Vapor Absorption systems (VAM), Solar based air conditioning, Demand based ventilation.

REFERENCE BOOKS

1. Majumdar, Mili, "Energy efficient Buildings in India", TERI 2001.
2. Manual on Solar Passive Architecture by IIT Bombay, 1999.

RESEARCH METHODOLOGY			
Course Code:	BAP-313	Credits:	01
No. of Practical Hrs/Week:	02	Mid Semester Exam Hours:	--
Total No. of Studio Hrs:	32	End Semester Exam Hours:	VV

INTRODUCTION

Knowledge of architectural research is essential for making informed decisions about architectural processes, design and detailing. It can also help to sharpen the critical thinking and evaluation skills of students.

AIM

To increase the student understands of the role of research in architecture.

OBJECTIVE

- To increase the student's abilities to conduct architecture research.
- To increase the student's abilities to interpret and evaluate research.
- To increase the student's abilities to present research results.
- To increase the student's understands of data, information, and knowledge.

OUTCOMES

- To develop the skill of framing research questions
- To develop the skill of design a simple research, including unit of analysis, sampling, selection of data collection method and development of instruments of research
- To develop the skill to write research reports

PEDAGOGY

Classroom teaching through multi-media supported by case studies.

EVALUATION SCHEME

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

<ul style="list-style-type: none"> • Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation) 	50%
<ul style="list-style-type: none"> • End Semester Viva Voce 	50%

CONTENTS

UNIT 1

Introduction- the need to study research methods

- The nature of science- scientific vs. non scientific questions.
- Scientific evidence, logic and reasoning, logic of scientific reasoning- deductive and inductive reasoning in science.

UNIT 2

Research Design

- Elements of research design- selecting topics for research, units of analysis, Variables, stating problem and hypothesis, stages of research.
- Introduction to Measurement process- conceptualization and operationalisation of variables.
- Introduction to sampling- why sampling, different types of sampling, Sampling design, etc

UNIT 3

Methods of Data Collection

- Methods of data collection, introduction to validity and reliability, qualitative research, quantitative research, multiple methods research, potential and limitations of different types of research.
- Tools and instruments of research, introduction to design of tools and instruments, potential and limitations of different types of tools and instruments.

UNIT 4

Data Processing and Analysis

- Introduction to data processing and elementary data analysis, introduction to research ethics
- Writing Research reports- Indexes and abstracts, major headings, referencing techniques etc

REFERENCE BOOKS

1. C. Hawkins & M. Sorigi, "Research: How to Plan, Speak and Write about it", Springer-Verlag, 1985.
2. Rajagopalan, Mathews and Ramamurthy, "Research Methodology", Indian Institute of Technology Kanpur, 1995.
3. Linda N. Groat, David Eang, "Architectural Research Methods", Pub. Wiley, 2013.

ELECTIVE 1- SUSTAINABLE DEVELOPMENT

Course Code:	BAP-315	Credits:	02
No. of Practical Hrs/Week:	04	Mid Semester Exam Hours:	-
Total No. of Periods:	64	End Semester Exam Hours:	VV

INTRODUCTION

Sustainable development gives an understanding towards adopting a holistic approach while framing out the strategies for present and future. Hence it is important for architecture students who play a major role in creating/ designing a built environment.

AIM

To familiarize students with the basic concepts and need for Sustainable Development and role of an architect in creating sustainable built environment

OBJECTIVE

- To sensitize students towards a holistic definition of sustainability
- To sensitize students towards the global environmental conditions across the globe
- To explore, how to create a built environment in a sustainable manner

LEARNING OUTCOMES

- The students would have understanding of various dimensions of sustainability
- The students would be aware of efforts being taken up at global scale to protect the environment
- The students would be able to understand role of an architect in sustainable development

PEDAGOGY

Classroom teaching through multi-media supported by case studies and may be supported by site visits.

EVALUATION SCHEME

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

• Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation)	50%
• End Semester Viva Voce	50%

CONTENTS

Concept of Sustainable Development

- Sustainability and its dimensions, sustainable development , cradle to cradle design, waste conservation, resource conservation, energy conservation, Embodied Energy
- Understanding climate, elements constituting climate, factors affecting climate, climate change, global warming, GHG, Brundtlands Report.

International Efforts for Sustainable Development

- Role of UNFCC : Millennium Declarations, MDG's, 2005 World Summit, Overview of elements of Kyoto Protocol (including DOHA Amendments) and Paris Agreement, SDG's

Sustainable Ecosystem

- Understanding the impact of built environment on variables like livelihood, poverty, food security, gender empowerment, etc.
- Identifying and working with sustainable design features like local resource and materials, local techniques/technology, site and ecology, community and culture, health, energy (including embodied energy), etc.
- Understanding green building and its constituents, interrelationship between built and open environment, Concept of Environmental Impact Analysis (EIA), etc.
- Cost effective building techniques, construction etc.

Practical application of aspect of sustainability in built environment

- Sustainability audit of a building from the aspect of sustainability and propose alternatives in design to make it sustainable through cost effective solutions. Proposals may be in form of drawings/reports/sketches etc.

REFERENCE BOOKS

1. "An Inconvenient Truth", A documentary Film by Al Gore, Ex Vice President of USA
2. Sassi, Paola, "Strategies for Sustainable Architecture", Taylor and Francis, 2006
3. Majumdar, Mili, "Energy Efficient Buildings in India", TERI Press, 2009
4. Correa Charles, "A Place in Shade", Penguin India, 2010
5. Deulgaonkar, Atul, "Laurie Baker: Truth in Architecture", Jyotsna Prakashan, 2015

ELECTIVE 1- ARCHITECTURAL CONSERVATION			
Course Code:	BAP-317	Credits:	02
No. of Practical Hrs/Week:	04	Mid Semester Exam Hours:	--
Total No. of Periods:	64	End Semester Exam Hours:	VV

INTRODUCTION

This subject offers insights into the importance of establishing identity (like cultural and place identity, etc.). It also introduces students to the ideas of regeneration and renewing buildings, urban areas and cultural landscapes through architectural intervention.

AIM

To help student understand the importance to establish connects between communities and built environment.

OBJECTIVES

- To develop sensitivity towards the built and un-built heritage
- To promote sense of identity and its relevance to architecture
- To equip them with architectural conservation techniques and its application while framing out

LEARNING OUTCOMES

- An holistic understanding of the development & its implication on society
- An enhanced understanding of the need to conserve the built and un-built space
- Better understanding of local architecture, construction techniques, materials, etc.

PEDAGOGY

Classroom teaching through multi-media supported by case studies and may be supported by site visits.

EVALUATION SCHEME

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

<ul style="list-style-type: none"> • Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation) 	50%
<ul style="list-style-type: none"> • End Semester Viva Voce 	50%

CONTENTS

Introduction

- An Introduction to conservation, preservation, restoration, reconstruction and adaptation;
- Understanding the Objectives, Principles and concepts of conservation and its application
- Importance of heritage in contemporary cities; exploring the linkages between heritage & communities

Movements & Theory

- History of conservation movements in the world and Indian response to the movement Development of theory of conservation
- Various charters of international importance
- Values and Ethics in Conservation and degrees of intervention in historic buildings and monuments and why to conserve issue.

Causes, Remedies & Techniques

- Causes of decay and deterioration of cultural property: External causes of decay, Biological and botanical Causes, Natural disasters and man-made causes.
- Inspection: The context of inspecting building-Inventory initial inspections of buildings, continued documentation and analysis. Preparation of inspection report.
- An overview of various techniques for conservation, restoration, preservation, reconstruction and adaptation.

Planning, Management & Legislation

- Concepts of historic towns, quarters and area concepts of heritage Zone and concept of integrated conservation. Planning and management aspects in architectural conservation techniques for buildings and areas.
- Introduction to policies, legislations, organizations, etc. pertaining to architectural conservation.
- Archaeological Survey of India ASI rules such as ancient monuments and archaeological sites and remains rules.

REFERENCE READINGS

1. Bernard M Feilden, "The conservation of Historic Buildings", Butterworth Architecture, Oxford, 1995.
2. Peter J Larkham, "Conservation and the City", Routledge, London & New York, 1996.
3. Graeme Aplin, "Heritage Identification, Conservation and Management", Oxford University Press, 2002.

ELECTIVE 1- ARCHITECTURAL JOURNALISM			
Course Code:	BAP-319	Credits:	2
No. of Practical Hrs/Week:	04	Mid Semester Exam Hours:	--
Total No. of Periods:	64	End Semester Exam Hours:	VV

INTRODUCTION

The need of making Architecture relevant for the society in which we live is most important now than ever. Referring Architecture to be a Science of Living, this subject intends to develop a critique in a student and at the same time equip the student with various trades by which this science is understood, simplified and then shared with the society.

AIM

To enable the students develop various skill sets to understand & explain the Architectural Language.

OBJECTIVES

- To prepare the students to understand the need for the subject
- To expose students to the current trends and modern practices in Industry and develop them as an architectural critique.

LEARNING OUTCOMES

- An ability to interpret and analyze the know-how of the subject
- Student would be able to enhance the skills like writing skills, photography skills, documentation, etc.
- An ability to see a bigger picture while analyzing and making conclusions.
- Ability to communicate effectively through both written and verbal modes.

PEDAGOGY

Apart from regular teaching; use of various interactive techniques like case studies, debates, assignments, discussions, mock panel discussions, documentation, may be ascertained through class exercises. The students may also be encouraged to publish articles/ research papers in the leading newspapers, journals, etc. and organize panel discussions with experts from various fraternities.

EVALUATION SCHEME:

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

<ul style="list-style-type: none"> • Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation)) 	50%
<ul style="list-style-type: none"> • End Semester Viva Voce/ Practical 	50%

CONTENTS

Introduction to Architectural Journalism

- What is Journalism, Architectural Journalism, Mediums of Journalism, and Role & Need of Architectural Journalism in present times, etc.
- Introduction to Structure of Architecture Journals; Writing Descriptive and Analytical Reports; Editing Write-ups, Photo Journalism, Book Reviews etc.

An Overview

- Brief history- photographs as social documentaries. Visual awareness and Visual Survey.
- Analysis of recent historical and contemporary examples of written and journalistic criticism of architecture, including selected writings by Indian and overseas critics; discursive techniques, analysis of major critical themes, comparison between various styles, Editing Practices, etc.
- Structuring the content- how to build up a case, establishing sequences, etc.

Learning the techniques

- Usage of language and vocabulary- introduction to methodology of writing essays, news writing, précis writing, writing in Architectural blogs, listening comprehension, analysis talks and gathering information, etc.
- To edit gathered information to build an article/ write up, promoting the originality of the topic. Collecting clippings from articles, blogs, books, etc.
- Photography- Various types regular, advance, amateurs photography, art photography; photo journalism –an overview and approach to photo journalism; news papers and magazine design elements, page make up; layout; colour scheme; Documentary of places; rural-urban public relations, etc.
- Case study of existing urban or rural set up, interpretation and analysis of the same.

Application of learned skills

- This may be ascertained by giving assignments to students in the form of Debates, Radio Programmes, Panel Discussion (concluded by a report, article, publication, etc)., Write-ups, documentary (video/ photo/ print), theme based portfolios, etc. as deemed suitable for the project undertaken.

REFERENCE BOOKS

1. Bender, Thomas, "Architecture and the Journalism of Ideas" Design Book Review: DBR no. 15, (fall 1988): 47-49.
2. Mohd.,Al- Asad and Majd Musa, "Architectural criticism and Journalism: Global Perspectives"- Umberto Allemandi & C., 2007.

COURSE STRUCTURE – SIXTH SEMESTER

S. No.	Paper Code	Paper Title	L (1)	S (1)	P(0.5)	Credits	Marks	ESE (*)	Duration of exam (HRS)
STUDIO COURSE									
1	BAP 302	Architectural Design – VI	-	10		10	100	VV	
PRACTICAL COURSE									
2	BAP 304	Building Materials & Construction Technology – VI	-	-	8	4	100	VV	
THEORY COURSES									
3	BAP 306	History of Architecture - VI	2	-	-	2	100	WR	3
4	BAP 308	Theory of Structures - VI	2	-	-	2	100	WR	3
5	BAP 310	Settlement Design	2	-	-	2	100	WR	3
6	BAP 312	Building Services -IV	3	-	-	3	100	WR	3
ELECTIVE COURSES									
7	BAP 314	Design Management							
8	BAP 316	Introduction to Healthcare Design	-	-	4	2	100	VV	
9	BAP 318	Architectural Model Making Techniques							
Total			09	10	12	25			

(*) Please see below for abbreviations:

VV – Viva Voce
WR – Written Exam

ARCHITECTURAL DESIGN-VI			
Course Code:	BAP-302	Credits:	10
No. of Studio Hrs/Week:	10	Mid Semester Exam Hours:	--
Total No. of Studio Hrs:	160	End Semester Exam Hours:	VV

INTRODUCTION

Sustainability is not merely observed in physical dimensions but is also reflected in lifestyle of people and architecture has a major role leading towards it.

AIM

To empower students to make informed decisions, which have a major impact on creating a sustainable built environment, through architecture.

OBJECTIVES

- To develop sensitivity towards architects' role in Sustainable Development, this encompasses not just environmental variables, but also issues of livelihood, poverty, resource conservation etc.
- To develop understanding of appropriate building services as per context
- To develop understanding in students about their role in creating a sustainable world.

LEARNING OUTCOMES

- Ability to design a project considering the statutory provisions and sustainable issues in a given context.
- To understand the constraints of a mixed use/ commercial typology in the given context, with respect to social norms, climate and client's expectations.

PEDAGOGY

- Case studies along with primary and secondary surveys.
- Site restrictions may be imposed in framing design problem
- Models/sketches/perspectives to be included in key submissions for development of communication skills.
- Students may be encouraged to conduct simulations for passive climatic control as a design tool.
- Role plays/ internal jury at key stages of design development process
- Architectural tour/site visits may be conducted.

EVALUATION SCHEME

The work will be presented as portfolio and will be evaluated through Viva Voce by a jury.

<ul style="list-style-type: none"> • Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation)) 	50%
<ul style="list-style-type: none"> • End Semester Viva Voce 	50%

CONTENTS

Exploring the opportunities for Sustainable Development through architectural solutions in mixed use/commercial building in the given context.

Design problem

The studio may be themed based on exploring sustainable development. The concept of sustainability encompasses not just environmental variables, but also issues of livelihood, poverty, migration, food security, democracy, human rights and peace. Suggestive themes could be resource conservation, area optimization, solar passive architecture, strengthening local economy through architecture etc.

Suggestive design projects may be a mixed use/commercial etc. The size of the project may be up to 12000 square meters. The design activity may also include as below (but may not be restricted to only these):

- Exploring the social fabric and social setting
- Study of site context, users/ user group, building resources, building systems, building services etc
- Case study- National or International
- Detailing of service cores / services in the project.
- Students may be encouraged to demonstrate the theme adopted for design studio through any one mode, for example report, estimation, simulations for passive/active climatic control, drawing, etc, apart from regular design submission.

REFERENCE BOOKS

1. Agkathidis, A., Hudert, M. and Schillig, G., "Form Defining Strategies: Experimental Architectural Design", Wasmuth, 2007.
2. Relevant Master Plan and Schemes/Missions/Reports of Govt. of India/Govt of State where study area/ site is located.
3. Majumdar, Mili, "Energy Efficient Buildings in India", TERI Press, 2009.
4. Papanek, Victor, "Design for the real World", Academy Chicago Publishers; 2nd edition, 1985.

BUILDING MATERIALS AND CONSTRUCTION- VI

Course Code:	BAP-304	Credits:	04
No. of Practical Hrs/Week:	08	Mid Semester Exam Hours:	--
Total No. of Studio Hrs:	128	End Semester Exam Hours:	VV

INTRODUCTION

This subject gives insights about drawings which are prepared for actual execution of work on site. This subject makes students capable of prepare working drawings.

AIM

The aim of this course is to familiarize the student with understanding of working drawing.

OBJECTIVE

- To familiarize students with working drawing
- To make students understand how to prepare working drawing.

LEARNING OUTCOMES

Having successfully completed this course, the student will be able to

- Understand the proper system of dimensioning in a working drawing in a working drawing.
- Understand various constituents of a working drawing.
- Understand how to prepare plans, sections, etc. and architectural details for buildings for execution on site.

PEDAGOGY

Classroom teaching is supported by preparation of working drawings

EVALUATION SCHEME

The work will be presented as portfolio and will be evaluated through Viva Voce by a jury.

• Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation)	50%
• End Semester Viva Voce	50%

CONTENTS

Working Drawing

- Working drawing of floor plans, elevations and sections. Drawings shall include: plan/s, foundation plan/s, layout plan showing different buildings, internal roads, water supply, sewage including area drainage plan. Elevations: Elevations of all sides (front, back, and both sides), sections: Transverse and longitudinal sections, sections through staircase, lifts and sanitary units.

Architectural Detailing

Working drawing of services

- Drawings of Architectural Details, includes scheduling of different finishes, doors, windows including hardware fixtures. Preparation of roof drainage system layout, layout of sanitary plumbing lines and scheduling the fixtures in toilets and kitchens etc. Layout of electrical lines and fixtures.

REFERENCE BOOKS

1. Rasmusson, S.E., "Experience Architecture", Chapman and Hall Ltd., 1964.
2. Frank, D.K. Ching, "Drawing: A Creative Process", Van Nostrand Reinhold, 1990.
3. Frank, D.K. Ching, "Design Drawing", Van Nostrand Reinhold, 1998.
4. "DETAIL", professional journal, Detail publishers.

HISTORY OF ARCHITECTURE - VI			
Course Code:	BAP-306	Credits:	02
No. of Studio Hrs/Week:	02	Mid Semester Exam Hours:	1.5
Total No. of Studio Hrs:	32	End Semester Exam Hours:	03

INTRODUCTION

India witnessed development of distinctive architectural styles seventeenth century onwards. The course focuses on sensitization of students towards genesis of architecture through this time.

AIM

To understand evolution of Indian architecture from late Mughal period to post Independence era.

OBJECTIVES

- To understand western architecture during the modern periods.
- To study social changes and its impact on architecture
- To study various schools of thought and philosophies of modern architecture.
- To understand the background, development, concept and practice of modern architecture.

LEARNING OUTCOMES:

- Having successfully completed this course, the student will be able to understand evolution of architecture through times
- The student will be able to understand the impact of social, economic and political changes on architecture

PEDAGOGY

Classroom teaching through multi-media, may be supported by site visit to heritage/historical site as per syllabus.

EVALUATION SCHEME

Continuous assessment by teacher (based on the following) <ul style="list-style-type: none"> • Two Class Tests of 15 marks each (to be conducted after 6 weeks and 12 weeks of teaching in accordance with university academic calendar) • Assignments/Group Discussions/Viva-voce/Additional Test/Quizzes/attendance = 10 marks 	40%
End Semester Examination	60%

CONTENTS

Unit 1

Late Mughal and Indo-Sarsenic Architectural style

- Late Mughal, Lucknow Nawabi style of Architecture. Early European/ Colonial period Architecture in India – introduction to different colonial rules in India. Colonial Architecture: Portuguese (typical residence and Basilica of Bom Jesus, Goa), Dutch (typical residence/bungalow , Mattancherry Palace), French (typical villas, Bisilica of Sacred Heart of Jesus, Pondicherry), Indo Sarsenic architecture in India (Secretariat Building at New Delhi, Victoria Memorial at Kolkata)

Unit 2

Modernism in India

- Beginning and development- J.J. School of Architecture, Indian Institute of Architects, Nationalist Architecture. Influence of the masters- Le Corbusier, Louis I Kahn. Modern Indian architects- Achyut Kanvinde(IIT Kanpur, National Science Centre, Delhi), Joseph Allen Stein (India Habitat Centre, Triveni Kala Sangam), Charles Correa (Gandhi Smarak, Jawahar Kala Kendra, Kala Academy, Goa, Cidade Di Goa), B V Doshi (IIM Bangalore, NIFT Delhi, CEPT Ahmedabad, Amdavad ni Gufa), Raj Rewal (Hall of Nations, Asiad Village), U C Jain (Jodhpur University)

Unit 3

Post Independence Architecture in India

- Regional influence, appropriate technology, sustainability. Impact on late works of architects like Charles Correa and B V Doshi and Geoffrey Bawa, Laurie Baker, HUDCO. In this unit importance is to be given on the design philosophies in particular.

Unit 4

Globalization and its impact on Indian Architecture

- Globalization- Indian and Multi-National Companies. New typology- malls, offices, multiplex, star hotels, satellite towns (Gurgaon), the new urban residence. Introduction to rural housing, Indira Awas Yojana

REFERENCE BOOKS

1. Moffet, M., Fazio, M. and Wodehouse, L., "A World History of Architecture", McGraw-Hill., 2008
2. Watkin, D., "A History of Western Architecture", Thames and Hudson., 1986
3. Fletcher, B., "A History of Architecture", 20th Ed., Butterworth Heinemann., 1996
4. Frampton Kenneth, "Modern Architecture: A Critical History", Thames and Hudson., 1985
5. Lang Jon, Desai Madhavi and Desai Miki, "Architecture and Independence", Oxford University Press, 1997.

STRUCTURES - VI			
Course Code:	BAP-308	Credits:	02
No. of Studio Hrs/Week:	02	Mid Semester Exam Hours:	1.5
Total No. of Studio Hrs:	32	End Semester Exam Hours:	03

INTRODUCTION

This subject gives insights about structural behavior of building components used in distribution system with Reinforced Concrete Cement. This subject makes students capable of designing building components used in distribution system with Reinforced Concrete Cement.

AIM

The aim of this course is to familiarize the student with understanding of Reinforced Concrete Cement; its properties, uses etc. in distribution system

OBJECTIVE

- To develop quantitative understanding of external forces, internal reaction forces of spanning system.
- To develop skill of designing spanning system using Reinforced Concrete Cement

OUTCOMES

- Understand behavior of distribution system in Reinforced Concrete Cement structure.
- Analyze and understand the space and design of building components constructed in Reinforced Concrete Cement.
- Analyze the suitability of different distribution system in building.

PEDAGOGY

Classroom teaching may be supported by case studies, hand on activity and site visits.

EVALUATION SCHEME

Continuous assessment by teacher (based on the following) <ul style="list-style-type: none"> • Two Class Tests of 15 marks each (to be conducted after 6 weeks and 12 weeks of teaching in accordance with university academic calendar) • Assignments/Group Discussions/Viva-voce/Additional Test/Quizzes/attendance = 10 marks 	40%
End Semester Examination	60%

CONTENTS

Unit 1

Column

- Introduction to design of column in Reinforced Concrete Cement using relevant IS codes by limit state method

Unit 2

Foundation

- Introduction, Type of foundation, Depth of foundation, Theory & design of axially loaded isolated square footing and detailing of its reinforcement in Reinforced Concrete Cement using relevant IS codes by limit state method

Unit 3

Retaining wall

- Introduction, Type of retaining walls, Analysis & Design of Cantilever retaining walls and detailing of its reinforcement using relevant IS codes by limit state method.

Unit 4

Shear and development length

- Introduction to Shear and Development Length in Beams. Understanding of Shear stress, Diagonal tension, Shear reinforcement, Spacing of shear reinforcement, Problems of shear reinforcement, Development length, Anchorage bond, Flexural bond.

REFERENCE BOOKS

1. Kumar, A., "Stability Theory of Structures", Tata McGraw Hill Co. Ltd., 1985.
2. Prakash Rao, D.S., "Structural Analysis", University Press, 2007
3. Jain, A.K., "Strength of Materials and Structural Analysis", 2nd Ed., Nem Chand & Bros., 2008
4. Tung, Au. And Christano, P., "Structural Analysis", Prentice Hall International, 1987.
5. S. Ramamrutham, "Theory of Structures", Dhanpat Rai Publishing Company Private Limited-New Delhi; Ninth edition, 2014.
6. Indian Standard Plain and Reinforced Concrete, Code of practice - B.I.S. Code – IS 456: 2000.

SETTLEMENT DESIGN			
Course Code:	BAP-310	Credits:	02
No. of Lectures Hrs/Week:	02	Mid Semester Exam Hours:	1.5
Total No. of Lectures:	32	End Semester Exam Hours:	03

INTRODUCTION

Settlement design is the study and analysis of design elements/components/systems at a settlement scale.

AIM

To understand the city as a large system composed of physical components. The understanding of city and its components, the modern planning process as applied to a settlement is studied.

OUTCOMES

Having successfully completed this course, the student will be able to

- Understand various factors & parameters for settlement design
- Understand and develop sensitivity for planning of cities
- Understand various city planning done in the past.

PEDAGOGY

Classroom teaching through multi-media supported by case studies and may be supported by site visits.

EVALUATION SCHEME

Continuous assessment by teacher (based on the following) <ul style="list-style-type: none"> • Two Class Tests of 15 marks each (to be conducted after 6 weeks and 12 weeks of teaching in accordance with university academic calendar) • Assignments/Group Discussions/Viva-voce/Additional Test/Quizzes/attendance = 10 marks 	40%
End Semester Examination	60%

CONTENTS

Unit 1

History and components of city

- Overview to Historical perspective of city design.
- Introduction to Contemporary City as a Physical system & Components of City.
- Image structure of city of Kevin Lynch

Unit 2

Circulation Network

- Traffic and circulation: hierarchy of roads in Delhi Master Plan as a case.

- Circulation network as structuring element in a settlement.
- Transit Hubs as a public space, for example metro stations having much other commercial/office space within itself.
- Understanding a street and street design.

Unit 3

Statutory Norms and their impact on city design

- Basic Understanding of elements of Master Plan, Unified Building Byelaws (UBBL), NBC, Fire prevention norms, ECBC for their impact on settlements (Master Plan, UBBL, fire prevention norms as applicable to city of Delhi may be used for this purpose).
- Impact of contemporary policies/development models like Mixed Use, transit oriented development, on city design.

Unit 4

Site Level Design Issues

- Site planning, analysis and design; Off-site and One-site factors;
- Basic understanding of Urban Renewal, Re-development, Revitalization.
- Concept of inclusive and smart city

REFERENCE BOOKS

1. Kostof Spiro, "The City As Assembled- The Elements of Urban Form Through History", A Bulfinch Press Book Little, Brown and Company, Boston, New York, London , 1992.
2. Gallion Arthur B., Eisner S., "The Urban Pattern: City Planning and Design", CBS Pub. And Distributors, Delhi, 1984.
3. Rossi Aldo, "The Architecture of the City", the MIT Press , Cambridge , 1982.
4. Jacobs Jane, "the Death and Life of Great American Cities", Vintage Books, A Division of Random House, New York, 1961.
5. Lynch Kevin A., " The Image of the City", MIT Press, Cambridge, USA, 1960
6. Lynch Kevin A., "What Time is this Place", MIT Press, Cambridge, USA, 1972
7. Whyte William H., "The Social Life of Small Urban Spaces", Conservation Foundation, 1980.

BUILDING SERVICES – IV (Illumination, Acoustics, Fire Fighting & Lift)

Course Code:	BAP-312	Credits:	03
No. of Lectures Hrs/Week:	03	Mid Semester Exam Hours:	1.5
Total No. of Lectures:	48	End Semester Exam Hours:	03

INTRODUCTION

The course discusses various building services as an important component of building design.

AIM

To understand how and why various building services are incorporated in building design.

OBJECTIVES

- To understand conceptual and architectural understanding of Illumination Design and Acoustics
- To develop understanding to how to prepare relevant building services drawings.
- To develop understanding of planning Acoustical Treatment.

LEARNING OUTCOMES

Having successfully completed this course, the student will be able to

- Understand and apply various aspects of Illumination Design in tandem with day lighting.
- Understand Parameters & various techniques for Acoustical design of a building..

PEDAGOGY

Classroom teaching through multi-media and may be supported by site visits.

EVALUATION SCHEME

Continuous assessment by teacher (based on the following) <ul style="list-style-type: none">• Two Class Tests of 15 marks each (to be conducted after 6 weeks and 12 weeks of teaching in accordance with university academic calendar)• Assignments/Group Discussions/Viva-voce/Additional Test/Quizzes/attendance = 10 marks	40%
End Semester Examination	60%

CONTENTS

Unit 1

Illumination Design & Luminance Calculations

- Illumination Design in tandem with Day lighting. Indian Design Sky and Calculations thereon. Requirement of Artificial Lighting, Luminance and Glare.
- Units of Illuminance and usage of electrical energy for illuminance. Comparative Lighting systems efficiency through units of Lumens / watt. Lighting Power

Densities as per ECBC, Daylighting and Artificial Lighting design software, eg. Radiance

Unit 2

Acoustics & acoustical designing techniques

- Need of study of acoustics, Development of acoustics through different periods including the historical development of amphitheatres and concert halls, auditoria
- Fundamental characteristics of sound, behavior of sound in enclosed space, sound intensity, sound pressure, sound level meter, Factor influencing hearing.
- Noise, echo, reverberation, resonance with solution, Sabine's formula.
- Constructional and planning measures for good acoustical design. Acoustical materials, panel absorber, absorption coefficient of different materials from various sound absorbing materials.
- Case studies of acoustical sensitive interior space e.g. auditorium, recording studio etc.
- Acoustical designing, detailing, layout and space requirements.
- Control of noise pollution by landscape, buffer zone etc in Urban area, control of traffic noise.

Unit 3

Fire Fighting

- Causes and Spread of Fire
- Combustibility of Materials and Safety Norms
- Fire prevention, detection and firefighting equipment- smoke detectors, monitoring devices, alarm systems, etc.
- Fire Fighting Systems & Controls
- Design of Fire escapes for high rise buildings

Unit 4

Lifts

- Types of lifts, their control, installation and operation
- Definition of average lift carrying capacity, rated load, rated speed, RTT, etc.
- Details of lift section, machine room, equipment, lift well and lift pit
- Design standards for lifts lobby, lift cars size etc from building codes
- Escalators and Conveyors

REFERENCE BOOKS

1. "Fundamentals of Acoustics", Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens and James V. Sanders, John Wiley & Sons; 4th Edition, 2000.
2. "Acoustics in the Built Environment: Advice for the Design Team", Peter Mapp, Peter Sacre, David Saunders and Duncan Templeton, Architectural Press, 1993.
3. National Building Codes 2016 – Bureau of Indian Standards.

ELECTIVE 2- DESIGN MANAGEMENT			
Course Code:	BAP-314	Credits:	2
No. of Practical Hrs/Week:	04	Mid Semester Exam Hours:	--
Total No. of Periods:	64	End Semester Exam Hours:	VV

INTRODUCTION

An architect needs to understand the business environment in which s/he is supposed to work. There exist different types of project and stakeholders. In order to broaden the perspective of students and give them better understanding of the project ecosystem, this subject is thus being introduced to help explore various possibilities/ roles that exist for architects.

AIM

To inculcate the principles of responsible design in students by understanding various roles of an architect in a project life cycle.

OBJECTIVES

- To develop greater understanding towards project ecosystem
- To expose the students to the desired requirements of the construction industry from architects
- To enhance the leadership and management qualities

LEARNING OUTCOMES

- An holistic understanding of the project & its technicalities
- An enhanced skill set
- Better preparedness to the demands of the Construction Industry

PEDAGOGY

Apart from regular lectures; various industry visits, architect's interview, etc. may be conducted/ undertaken for/ by students to get a firsthand experience.

EVALUATION SCHEME

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

<ul style="list-style-type: none"> • Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation) 	50%
<ul style="list-style-type: none"> • End Semester Viva Voce/ Practical 	50%

CONTENTS

Introduction to Design Management

- Project and its Stakeholders
- Operative and Management Framework

- The Responsibilities of Design Managers in different Roles
- The relevance & Need of Design Management
- Design Management as a tool to establish link with the end-user.

An Overview

- Project Examples where Design Management has been effectively used. Students may be encouraged to interact with Design Managers in the Industry to understand the challenges associated with the profile.
- Analysis of a case study to understand the matrix of Design Management

Learning & Applying Design Management Techniques

- Understanding the project life cycle like Project Planning, Financing, Execution, Commissioning, etc.
- Implementing Efficient Design Management Framework, Matrix for Design Management, etc.
- Document Administration and Management; Types, Need & Importance & Current Practices of Document Management in the Field, etc.
- Project Coordination- in various stages of project like Pre-Design, During Design Development, During Execution stage & Post Execution stage, etc.
- Controlling the Site and keeping a track on Site Development; plus resolution of site issues, etc.
- Technical Writing- Types and Process, etc.
- Communication- What is communication & how efficient and effective communication is done, etc.
- Project Marketing and Architect

Application of learned skills

- This may be ascertained by giving assignments to students in the form of Case Study, Debates, Panel Discussion, Write-ups, documentary, etc. as deemed suitable for the project undertaken.

REFERENCE BOOKS

1. Kathryn Best, "Design Management: Managing Design Strategy, Process and Implementation", AVA Publishing SA, 2006
2. Kathryn Best, "The Fundamentals of Design Management", AVA Publishing SA, 2010.

ELECTIVE-1: INTRODUCTION TO HEALTHCARE DESIGN

Course Code:	BAP-316	Credits:	02
No. of Studio (Hrs/Week):	04	Mid Semester Exam Hours:	-
Total No. of Studio hours:	64	End Semester Exam Hours:	VV

INTRODUCTION

With advancements in health care industry, there has been a great need of architects to understand the technicalities involved in the establishment of health care infrastructure. This course is an attempt to expose them to these requirements.

AIM

To introduce students to healthcare design and its socio-economic impact on the health of the concerned population.

LEARNING OUTCOMES

- Understanding how Public health, Healthcare facilities and Healthcare Design are interrelated to each other.
- Hierarchy and Type of Healthcare Facilities, emphasis on epidemiology, Nomenclature and Accreditation.
- Comparative analysis of Healthcare development in Developed, developing and under developed countries. Understanding designing for classes and masses with emphasis on patient to doctor ratio.
- Understanding the parameters that govern the design of a healthcare facility and its impact on the concerned population.
- Understanding what is evidence base design and energy efficiency in healthcare facilities.

PEDAGOGY

Role model activities, Primary and Secondary studies and documentations, Expert lectures by Professional Healthcare Architects, workshops and hands on classroom activities.

EVALUATION SCHEME

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

• Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation)	50%
• End Semester Viva Voce	50%

CONTENTS

Introduction

- Introduction to World healthcare programs, Government initiatives in India and Abroad and scope of healthcare development in the present scenario. The importance of Epidemiology study, population demographics and Public health. Introduction to Urban and rural healthcare needs. Analysis of demand and supply in developed, Developing and under developed countries.

Public Health and Healthcare Facilities

- Study and analysis of healthcare demands of concerned population, projected needs and estimated healthcare requirement in future. Visits to a healthcare facility in Urban/ neighboring rural area may be conducted. Documentary of issues and healthcare related problems and need. Type of healthcare facility with respect to population density, regional parameters, land resource and other aspects.

Healthcare facilities and Healthcare Design

- Primary and secondary case studies to understand the functioning of a teaching and non-teaching healthcare facility. The hierarchy of Healthcare facilities in terms of services provided and their governing parameters. Accreditation of healthcare facilities and its impact on public trust. Evidence based design and importance of energy efficiency.

Design Parameters

- Understanding the basic parameters leading to a good functional design. Study and analysis of flow of thought processes, segregation of spaces, services and other governing parameters. Understanding basic nomenclature, terms and flow paths. Design concerns and impact of health indicators on healthcare design. Understanding Drawing and drafting symbols, techniques and presentation skills.

REFERENCE BOOKS

1. Andrea Boeke, "Architecture for Healthcare Book", Images Publishing Group Pty Ltd; 01 edition 2007
2. Chris Wright and Julius Sim, "Research in Health Care: Concepts, Designs and Methods Book", Nelson Thornes Ltd,, 2006.
3. G D Kunders, "HOSPITALS: Facilities Planning And Management Book", McGraw Hill Education; 1 edition, 2004.
4. Richard L. Kobus , Ronald L. Skaggs, Michael Borrow, Julia Thomas, Thomas M. Payette and Sho-Ping Chin, "Building Type Basics for Healthcare Facilities Book" Wiley, 2008.
5. Richard L. Miller and Earl S. Swensson,"New Directions in Hospital and Healthcare Facility Design", McGraw-Hill Inc.,US , 1995
6. Richard L. Kobus and Ronald L. Skaggs, "Building Type Basics for Healthcare Facilities", Wiley, 2000.

ELECTIVE 2: ARCHITECTURAL MODEL MAKING TECHNIQUES

Course Code:	BAP-318	Credits:	2
No. of Studio (Hrs/Week):	04	Mid Semester Exam Hours:	-
Total No. of Studio hours:	64	End Semester Exam Hours:	VV

INTRODUCTION

Model making is an effective tool for visualizing the spaces in three dimensions for architects and designers. This subject exposes students to various techniques associated with the model making.

AIM

This elective aims at Understanding the ways that architects and designers use models to explain their concepts in the third dimension.

OBJECTIVES

- Use model as a design tool.
- To use model making as a visualization tool for space making.

LEARNING OUTCOMES

- To explore the work of professional model makers using professional techniques, with guidance and direction given by specialist tutor.
- An enhanced understanding for working with simple materials like resins, silicones, plastics and polymer clays the course.
- A greater insight into an inspiring, creative and sometimes overlooked career option.

PEDAGOGY

Workshop based teaching with exposure to various model making tools and materials. Hands on learning and teaching techniques. Audiovisual classes to understand National and international model making methods. Field visits to professional model making workshops and tools and material shops may be conducted/ organized.

EVALUATION SCHEME:

The work will be presented as portfolio and will be evaluated through Viva voce by a jury.

• Continuous evaluation by teacher(to be based on performance in studio/workshop/lab, attendance, assignments/projects, quizzes etc. (50 marks multi- stage evaluation)	50%
• End Semester Viva Voce/ Practical	50%

CONTENT

Introduction

- Introduction to the importance of three dimensional visual representations of Architectural projects.
- Introduction to basic materials used in model making, their construction techniques and Model making tools.

3D Representation Techniques

- Study and Analysis of type of model desired at various stages of design ranging from study models to professional model making, which helps in design exploration and space creation. Hands on work experience of using materials like thermocol (Usual and compressed), Photographic mount boards etc and 3D printing.

Complementary Appendages

- Study and Analysis of various additional objects required to scale a model like trees, cars, lampposts, human figures etc. Understanding their various types, material and construction methodology and storage techniques.

REFERENCE BOOKS

1. Nick Dun, "Architectural model making", Laurence King, 2010.
2. Arjan Karssen, Bernard Otte, "Model Making: Conceive, Create, Convince", Thames and Hudson, 2014.
3. Wolfgang Knoll and Martin Hechinger, "Architectural models, Construction techniques", second edition, Ross Publishing, 2007.