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UNIVERSITY OF MYSORE

Established: 1916

Vishwavidyanilaya Karyasoudha
Crawford Hall, Mysore-570 005

No.AC.2(S)/151/2021-22

Dated: 18.08.2021

NOTIFICATION

Sub: Changes of Syllabus, Curriculum of 3rd year (5th and 6th Semester) (CBCS) of B.Arch for the students admitted during the academic year 2020-21.

Ref: 1. Decision of Board of Studies in Urban & Regional Planning (UG & PG) meeting held on 17.12.2020.
2. Decision of the Faculty of Science & Technology Meeting held on 08.02.2021.
3. Decision of the Academic Council meeting held on 07.04.2021.

*****

The Board of Studies in Urban & Regional Planning (UG & PG) which met on 17.12.2020 has approved the changes of Syllabus, Curriculum of Bachelor of Architecture 3rd year (5th & 6th Semester) (CBCS) of Bachelor of Architecture for the students admitted during the academic year 2020-21.

The Faculty of Science and Technology and Academic Council meeting held on 08.02.2021 and 07.04.2021. respectively have approved the above said proposal and the same is hereby notified.

The detailed Syllabus of this course is annexed. The contents may be downloaded **from the University Website i.e., www.uni-mysore.ac.in**.

DRAFT APPROVED BY THE REGISTRAR

18/8

DEPUTY REGISTRAR (ACADEMIC)
Deputy Registrar (Academic)
University of Mysore
Mysore-570 005

To:

1. The Registrar (Evaluation), University of Mysore, Mysore.
2. The Dean, Faculty of Science & Technology, DoS in Psychology, MGM.
3. The Chairperson, BoS in Architecture (UG & PG), School of Planning and Architecture, Manasagangotri, Mysore.
4. The Director, School of Planning and Architecture, Manasagangotri, Mysore.
5. The Deputy/Assistant Registrar/Superintendent, AB and EB, UOM, Mysore.
6. The P.A. to the Vice-Chancellor/Registrar/Registrar (Evaluation), UOM, Mysore.
7. Office file.

ANNEXURE - I

SCHOOL OF PLANNING AND ARCHITECTURE

UNIVERSITY OF MYSORE,
Manasagangotri, Mysuru.

BACHELOR OF ARCHITECTURE - Five Year Degree Programme

Detailed Syllabus of V & VI Semesters

(Admission Year 2020-21)

UNDER CHOICE BASED CREDIT SYSTEM (CBCS) 2020-21 Batch

Detailed Curriculum and Syllabus of V & VI Semesters

Admission Year 2020-21

B.ARCH. DEGREE PROGRAMME (5 YEAR)
V and VI SEMESTERS CURRICULUM (CBCS)-2020-21

SEMESTER – V

Sl.No	Course Code	Course Title	L	S	P	C	Marks			Mode of Exam
							I	E	Total	
1	ARS501	Architectural Design-IV	0	9	0	9	100	100	200	JURY(Viva Voice)
2	ART502	Building Materials & Construction - V	1	0	6	4	100	50	150	Written (3hrs)
3	ART503	Contemporary Architecture	3	0	0	3	50	50	100	Written (2hrs)
2	ART504	Building Services-III (HVAC, Lift & Fire Safety Services)	2	0	0	2	50	50	100	Written (2hrs)
5	ART505	Design of R.C.C. Structures - II	3	0	0	3	50	50	100	Written (3hrs)
6	ART506	Energy Efficient Architecture	2	0	0	2	50	50	100	Written (2hrs)
7	ARE507	**Elective-II**	2	0	0	2				
		TOTAL NO.OF CREDITS				**25**				

Courses which can be chosen during semester-V in Elective-II

Sl.No	Course Code	Course Title	L	S	P	C	Marks			Mode of Exam
							I	E	Total	
1	ARE507 - 1	Waste Management and Recycling	2	0	0	2	50	50	100	Written (2hrs)
2	ARE507 - 2	Furniture & Product Design	2	0	0	2	50	50	100	Written (2hrs)
3	ARE507 - 3	Architecture Journalism & Photography	2	0	0	2	50	50	100	Written (2hrs)
4	ARE507 - 4	Cost Effective Technology	2	0	0	2	50	50	100	Written (2hrs)

SEMESTER – VI

Sl.No	Course Code	Course Title	L	S	P	C	Marks			Mode of Exam
							I	E	Total	
1	ARS601	Architectural Design-V	0	10	0	10	100	100	200	JURY(Viva Voice)
2	ART602	Working Drawing & Detailing	1	0	6	4	100	-	100	Prog.Marking
3	ART603	Ecology and Landscape	2	0	0	2	50	50	100	Written (2hrs)
4	ART604	Design of steel structures	3	0	0	3	50	50	100	Written (3hrs)
5	ART605	Estimation, Costing & Valuation	3	0	0	3	50	50	100	Written (2hrs)
6	ART606	**Elective-III**	2	0	0	2				
TOTAL NO.OF CREDITS						**25**				

Courses which can be chosen during semester-VI in Elective-III

Sl.No	Course Code	Course Title	L	S	P	C	Marks			Mode of Exam
							I	E	Total	
1	ARE607-1	Sustainable Architecture	2	0	0	2	50	50	100	Written (2hrs)
2	ARE607-2	Constitution of India	2	0	0	2	50	50	100	Written (2hrs)
3	ARE607-3	Theory of Design	2	0	0	2	50	50	100	Written (2hrs)
4	ARE607-4	Structure and Architecture	2	0	0	2	50	50	100	Written (2hrs)

Abbreviation

L - Lecture
S - Studio
P -Practical
C - Credit
I - Internal assessment
E - External assessment

ARS - Architectural Studio

ART - Architectural theory

ARE - Architectural elective

Prog. Marking - Progressive Marking

DETAILED SYLLABUS

YEAR-III SEMESTER-V

Subject: ARCHITECTURAL DESIGN - IV		
Code: ARS501	**Credits: 9**	**Hours / Week: 12 hrs.**
Progressive Marks: 100	**Examination Marks: 100**	**Mode of Exam: Jury**

AIM:

At the intermediate stage to graduate the student further on design of small complexes or buildings involving technology, structural clarity and services in terms of lighting, ventilation, movement pattern, fire safety, security, water supply, sewage etc, Thrust will be also on use of computer for presentation skills and introducing elements and detail for making building barrier free design.

OBJECTIVE:

- To train the student to gather knowledge on the given design project based on books / literature and websites.
- The students are to be exposed to expert lecture from expert architect, for each project or design.
- To make the student understand the complexity, functioning and salient features of the Integration of function: movement, climate, acoustics, structure and services into the building
- Landscaping and site planning.

DESIGN STUDIO:

Small complexes - concept of multi planning and circulation analysis - massing problems involving building technology, - Design and detailing for movement of physically handicapped and elderly persons within and around buildings.
Examples: Shopping centers (Commercial) Home for aged, Health centers, Nursing homes (institutional), Orphanage homes etc.
Introduction to three-dimensional modeling of spaces using Computer. Costruction and manipulation of three-dimensional building databases, Rendering 3 D images and Presentation techniques.

COURSE OUTCOME:

On successful completion of the course, the students will be able to:

- Acquaint with knowledge base on special characteristics of the build environment in an urban context focusing on site planning and landscape having significant architectural feature.
- Understand the complexity in architectural character of the built environment and respond positively through appropriate use of built form, choice of building materials, structural clarity and services, etc.

REFERENCES:

1. Edward D.Mills, Planning, 4 volumes, Newnes, Butterworths, London, 1976.
2. P&D Act 1995.
3. E and O.E. Planning. Lliffee Books Ltd., London, 1973.
4. National Building Code and Bureau of Indian standard publications.
5. Ed.By.Quentin Pickard RIBA - The Architects' Hand Book - Bladewell Science Ltd. – 2002.
6. De Chiara Callender, Time Saver Standard for Building Types, McGraw-Hills Co., 1973.

Subject: BUILDING MATERIALS & CONSTRUCTION - V		
Code: ART502	**Credits: 4**	**Hours / Week: 6 hrs.**
Progressive Marks: 100	**Examination Marks: 50**	**Duration of Exam: 3 hrs**

AIM:

The aim of the topic is to deals with principles, methods and construction practices of structural steel work

OBJECTIVES:

To introduce and expose students to various aspects involving roof coverings

- To introduce the use of steel for construction activity of buildings and structures

COURSE CONTENT:

UNIT–I: ROOF COVERINGS
Introduction, requirements of roof, technical terms, classification, types of roof coverings for pitched roof. Roofing tiles and roofing with cement products like A.C. sheet roofs, G.I. Sheets roofs, slates.

Miscellaneous Materials and treatments: Properties and uses of Asbestos, cork, felt, mica, adhesive, china clay, fiber glass, leather, canvass, jute, rubber, Asphalt and Bitumen

UNIT–II: MATERIALS FOR SPECIAL TREATMENTS
Facade materials and Insulation materials – thermal and sound insulation materials, acoustical treatment, Plastics such as polycarbonates, acrylics, PVC polymer films, FRP – types, properties and uses.

UNIT–III: STEEL STRUCTURES - Foundation and roofing
Fabrication, erection, fixing of girders, stanchions,
Roofing - Large Span Structure: Steel trusses of different spans, lattice girder, and north light glazing, AC sheet or GI sheet covering. Typical details tubular trusses, basic space frames.

UNIT–IV: INTRODUCTION TO PRE-CAST AND PRE ENGINEERED STRUCTURES
Pre coated corrugated MS sheet roofing-crimping to make different curved roofs. Pre-cast concrete trusses: Advantages over steel trusses, truss with castellated girders, rain water disposal.

UNIT–V: ESCALATORS & ELEVATORS
Introduction to different types of elevators and escalators in structures like apartments, hospitals, shopping malls, airports

COURSE OUTCOME:

On successful completion of the course, the students will be able to:

- To familiarize the method of construction of various roof coverings with different materials, and building components using steel and precast concrete.
- To acquaint themselves with the construction methods of foundation of steel structures and pre-engineered structures
- To gain perspective on the properties of material for special treatments like insulation and acoustic - acrylics, PVC polymer films, FRP.
- To provide knowledge on the selection criteria of elevators and escalators in different building types.

REFERENCE BOOKS

1. Chowdary, K.P. Engineering Materials are used in India, 7th ed. Oxford and IBH Pub. Ltd., New Delhi, 1990.
2. Moxley, R. Mitchell‟s Elementary Building Construction, Technical Press Ltd.
3. W.B. Mackey (vol – II) "Building Construction" ; B.C. Punmia "Engineering Materials"
4. Foster Stround Mitchee "Advanced Building Constructions"
5. Bindera and Arora. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub., New Delhi, 2000.
6. McKay J.K. Building Construction Metric Vol. 4, 4th ed. Orient Longman Pvt. Ltd., Mumbai, 2002.
7. Mitchell. Advanced Structures.
8. Rangwala, S.C. Engineering Materials: Material Science, 31st ed. Charotar Pub. House, Anand, 2004.

Subject: CONTEMPORARY ARCHITECTURE		
Code: ART503	**Credits: 3**	**Hours / Week: 3 hrs.**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 2 hrs.**

AIM:

To provide an understanding and appreciation of Contemporary trends in Indian and Western Architecture in terms of Ideas and directions through the works of outstanding architects.

OBJECTIVES:

- To provide an understanding of architecture from Industrial Revolution to the Modern movement and to study various Movements, Schools, Styles, and Influences.
- To orient the students to various developments in the field of architecture for a greater understanding of trends in contemporary architecture.
- To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.
- To provide an understanding and appreciation of Contemporary trends in Indian and Western Architecture in terms of Ideas and directions through the works of outstanding architects.

COURSE CONTENT:

UNIT-I: INDUSTRIAL REVOLUTION AND ITS IMPACT
Industrial revolution and its impact on the social, economic and political factors, its effects, new requirements of the society. New Materials and Technologies: Emergence of new building typologies - history of steel, glass and concrete.

UNIT-II: MODERN ARCHITECTURE
Historicism, Modernism, Utilitarianism and Functionalism, The Bauhaus, Organic Modernism, Brutalism, Chicago School, Formalism, Structuralism, Expressionism, Minimalism, Futurism, Postmodernism, Deconstructivism. Arts and crafts movement, Art Nouveau, Art Deco, Monumentalism, Expressionism.

UNIT-III: PHILOSOPHIES AND WORKS OF GREAT MASTERS
Le Corbusier, Frank Lloyd Wright, Walter Gropius, Louis Kahn and Mies Van Der Rohe.

UNIT-IV: PHILOSOPHIES AND WORKS OF INDIAN ARCHITECTS
BV Doshi, Charles Correa, Raj Rewal, Achyut Kanvinde, Uttam Jain, Lauire Baker, Anant Raje.

UNIT-V: PHILOSOPHIES AND WORKS OF INTERNATIONAL ARCHITECTS
Oscar Niemeyer, Richard Meier, Charles Moore, Norman Foster, Santiago Calatrava, Renzo Piano, Bernard Tschumi, Frank Gehry, Zaha Hadid, Rem Koolhas, Hassan Fathy, Geoffery Bawa, Richard Rogers, Tadao Ando, I.M. Pei, Kenzo Tange.

Note: Work of Contemporary architects of India and their recent work shall be explored through seminars and assignments.

COURSE OUTCOME:

On successful completion of the course, the students will be able to:

- To study different architectural movements during Modern Architecture Period and study the styles and impact.
- To familiarise the Contemporary trends in Indian and Western Architecture in terms of Ideas and directions through the works of outstanding architects
- To provide in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.

TEXT BOOKS:

1. Sir Banister Fletcher, "A History of Architecture", CBS Publications (Indian Edition), 1999.
2. G.K.Hiraskar, "Great Ages of World Architectur", Dhanpat Rai & Sons, Delhi.
3. Spiro Kostof, "A History of Architecture:Setting and Rituals, Oxford University Press, London, 1985
4. Francis D K Ching "Global History of Architecture"
5. Leland M Roth; "Understanding Architecture: Its Elements, History and Meaning"; Craftsman House; 1994.
6. Emily Cole "Grammar of Architecture"

REFERENCES:

1. Bhatt, Vikram and Scriver, Peter. Contemporary Indian Architecture after the Masters. Mapin Pub. Pvt. Ltd., Ahmedabad, 1990.
2. Curtis, J.R. William. Modern Architecture since 1900. Prentice-Hall, Inc., New Jersey, 2002.
3. Jencks, Charles.The Language of Post-Modern Architecture, 4th ed. Academy Editions, London, 1984.
4. Frampton, K Tad Ando- buildings, Projects Writings, New York Rizzoli, 1984.
5. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London.
6. Sigfried giedion, Space time and Architecture: The Grwoth of a new tradition, Harvard University Press.
7. Manfredo Taferi / Franceso dal co, Modern Architecture, Faber and Faber/ Electa, 1980.
8. Lang, Desai, Architecture & Independence, Oxford University Press, New Delhi.
9. Sarbjit Bahga et all, Modern Architecture in India, Galgotia Publishing Company, New Delhi.
10. Morgan, Ann Lee & Taylor Colin “Contemporary Architecture” by
11. Bahga, Modern Architecture in India: Post Independence Perspective, Galgotia, 1993, New Delhi.
12. Hugh, Pearman, Contemporary World Architecture, Phaidon Press Ltd, 1998, Minneapolis.

Subject: BUILDING SERVICES – III (HVAC, LIFTS & FIRE SAFETY SERVICES)		
Code: ART504	**Credits: 2**	**Hours / Week: 3 hrs.**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 2 hrs.**

AIM:

Understand the operations of Lifts & Escalators locations, functions and various equipments used in HVAC and application of Fire fighting NBC norms in complex buildings.

OBJECTIVE:

- To identify the factors responsible for cooling load calculation.
- To classify different types of Air Conditioning systems and their suitability for different psychometric conditions.
- To explain the function of mechanical equipments for vertical transportation (elevators and escalators for buildings).
- To explain the different fire fighting methods to be adopted in buildings.
- To plan buildings as per the fire safety norms.

COURSE CONTENT:

UNIT-I: INTRODUCTION
Scope and impact of Mechanical system- Impact on Building design. Mechanical Services required in Buildings. Role of an Architect regarding mechanical Services

UNIT-II: MECHANICAL EQUIPMENTS FOR VERTICAL TRANSPORTATION

Building design and vertical transportation, Demand for vertical transportation. *Lift and Escalators*: types, uses, functioning, automatic control system, Plans & sections to explain different parts of lifts and escalators. Planning for vertical transportation

UNIT-II: PSYCHOMETRIC PROPERTIES
Psychometric chart & its application summer air conditioning system, winter air conditioning system, and year-round air-conditioning system. Conditions for comfort Control of quality, quantity, temperature and humidity of air.

UNIT-IV: PRINCIPLES OF AIR-CONDITIONING
Refrigeration cycle, Introduction to air conditioning, Indoor Air Quality (IAQ), comfort conditions, A/C equipment, compressor heat exchangers, condenser, evaporators, *Types of Air-conditioning:* single zone, multi zone, window air conditioners, split air conditioners, ductable air conditioners, package system and central air conditioning, all air systems and chilled water systems. A/C plant room, Air Handling Units (AHU's) Building ducting, diffusers and grills, Fan Coil units ASHRAE and ISHRAE standards and guidelines.

UNIT-V: FIRE FIGHTING NORMS (NBC) & EQUIPMENTS

Role and Importance, Fire safety design, planning for fire protection. Fire detection & fire fighting. Different fire fighting methods to be adopted in buildings. I S Codes for fire fighting.

COURSE OUTCOME

On successful completion of this course, the student should be able to:

- To understand fire safety design, planning for fire protection
- To acquaint with knowledge base of function of mechanical equipments for air conditioning, vertical transportation (elevators and escalators for buildings)
- To familiarise the principle of psychometric chart & its application.
- To understand and study the application of these equipments in different types of buildings depending on the size and scale.

REFERENCES:

1. Roger W.Haines: HVAC system design handbook.
2. Ananthanarayanan PN: Refrigeration and Air Conditioning.
3. ISHRAE: HVAC hand book
4. Architectural Graphic Standard (HVAC System)
5. National Building code.
6. William.K.Y.Tao; "*Mechanical and electrical Systems in Buildings"*
7. V.P.Lang*," Principles of air conditioning*"
8. Rodney R.Alder *;"Vertical Transportation for Building"* .
9. Lord, Peter and Templetion, Duncan. The Architecture of Sound: Designing.
10. Places of Assembly. Architectural Press Ltd., London, 1986.
11. Egan, David. Architectural Acoustics, MC Graw-Hill Book Ccompany, New York, 1988.

Subject: DESIGN OF RCC STRUCTURES – II		
Code: ART505	**Credits: 3**	**Hours / Week: 3 hrs**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 3 hrs.**

AIM:

This course focuses on structural design of different elements of RCC buildings.

OBJECTIVE:

- To use limit state design for analysis and design of columns.
- To use limit state method for design of concrete staircase.
- To enable the learning of design of structural elements like footings and retaining walls.
- To understand the principle, methods, advantages and disadvantages of prestressed concrete.
- Case studies and models wherever applicable.

COURSE CONTENT:

UNIT-I: DESIGN OF COLUMNS
8 hrs
General aspects, Loads on columns, Minimum eccentricity, Design of short axially loaded columns, Design of column subject to combined axial load and uniaxial moment, Detailing.

UNIT-II: DESIGN OF STAIR CASE
Introduction, Types of stair case, Loads on stair cases, Design of dog legged stair case, Detailing.

UNIT-III: DESIGN OF FOOTINGS
Introduction, Types of footings, Design of isolated footings for axial load and axial load & uniaxial moment, Detailing.

UNIT-IV: DESIGN OF RETAINING WALL
Types of retaining wall, Stability criteria, Design of cantilever type retaining wall, Detailing.

UNIT-V: INTRODUCTION TO PRESTRESSED CONCRETE
Basic principles of prestressing, Methods of prestressing, Advantages and disadvantages. Introduction to pre-tensioning and post tensioning of concrete.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Familiarize the different concepts in designing footings, columns, retaining walls and dog legged staircase using LSD (limit state design) methods.
- Apply concepts of Pre-stressed concrete in real cases.

TEXT BOOKS:

1. Jain, A.K., Reinforced Concrete: Limit State Design, 5th ed. New Chand and Bros., Roorkee, 1999.
2. Ramamrutham. S. and Narayan, R. Design of RCC Structures, 12th ed. Dhanpat Rai swPub. Co. Pvt. Ltd., Delhi, 1998.
3. Punmia, B.C., "Reinforced Concrete Structures", Vol. 1 & 2, Laxmi Publications, Delhi, 2004.
4. Varghese, P.C., Limit State Design of Reinforced Concrete, Prentice-Hall of India Private Limited, New Delhi, India

REFERENCES:

1. P. Dayaratnam, "Design of Reinforced Concrete Structures", Oxford and IBH Publishing CO., 1983.
2. N.C.Sinha and S.K.Roy, "Fundamentals of Reinforced Concrete", S.Chand and Co., New Delhi, 1983.
3. Krishna Raj, "Prestressed Concrete Structures", 3rd Edition, Tata McGraw Hill, 2005.

Subject: ENERGY EFFICIENT ARCHITECTURE		
Code: ART506	**Credits: 2**	**Hours / Week: 3 hrs.**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 2 hrs.**

AIM:

To make the student understand the traditional techniques of construction for different climatic zones to make the building energy efficient

OBJECTIVES:

- To trace out evolution of energy conscious buildings and techniques from historic period based on climatic zone of the world.
- To enable students, understand solar geometry and heat transfer mechanism in buildings and energy conservation.
- To familiarize the students with simple techniques for design considerations.

COURSE CONTENT:

UNIT-I: CLIMATE AND SHELTER
Historic buildings - pre-industrial, post-industrial and modern architecture - examples from different climatic zones

UNIT-II: SITE PLANNING AND DEVELOPMENT
Landform - vegetation type and pattern - water bodies open spaces and built spaces – urban scape - design strategies. Significance of Energy Efficiency in the contemporary context, Simple passive design considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope - Heat transfer and thermal performance of walls and roofs

UNIT-III: ADVANCED PASSIVE ARCHITECTURE- PASSIVE HEATING
Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium - Isolated Gain

UNIT-IV: PASSIVE COOLING
Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling – Induced
Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels

UNIT-V: RENEWABLE ENERGIES
Innovation technologies for energy efficiency such as Photo Voltaic Cells, Battery Technology and renewable resources techniques such as solar energy, wind energy etc.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- To acquaint with knowledge on traditional techniques of construction for different climatic zones to make the building energy efficient
- To understand climate responsive historic buildings of pre-industrial, post-industrial and modern architecture from different climatic zones
- Define and apply advanced passive architecture, energy efficiency in the contemporary context and passive design considerations involving Site Conditions

TEXT BOOKS:

1. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi, 1999.
2. Arvind Krishnan & Others, "Climate Responsive Architecture", A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001.
3. Majumdar M, "Energy-efficient Building in India", TERI Press, 2000.
4. Givoni .B, "Passive and Low Energy Cooling of Buildings", Van Nostrand Reinhold, New York, 1994.

REFERENCES:

1. Fuller Moore, "Environmental Control Systems", McGraw Hill INC, New Delhi – 1993.
2. Sophia and Stefan Behling, Solpower, "The Evolution of Solar Architecture", Prestel, NewYork, 1996.
3. Patrick Waterfield, "The Energy Efficient Home: A Complete Guide", Crowood press ltd, 2011.
4. Dean Hawkes, "Energy Efficient Buildings: Architecture, Engineering and Environment", W.W. Norton & Company, 2002.
5. David Johnson, Scott Gibson, "Green from the Ground Up: Sustainable, Healthy and Energy efficient home construction", Taunton Press, 2008.

ELECTIVE – II

Subject: WASTE MANAGEMENT AND RECYCLING		
Code: ARE507-1	**Credits: 2**	**Hours / Week: 2 Hrs.**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 2 Hrs.**

AIM:

To convey waste management practices with a strong reclination towards environment and its alternative applications in the industry.

OBJECTIVES:

To provide knowledge about present practice and current scenario of different types of waste management

- To know about the segregations process and need for recycling
- To provide knowledge about sustainability and its approach
- To study about environment laws, rainwater harvesting, techniques, and alternative energy options

COURSE CONTENT:

UNIT-I: INTRODUCTION
Waste in built environment – Traditional practices of waste Management Current Scenario in India – Categorizations to solid, liquid and gaseous wastes – sectors responsible for waste generation.

UNIT-II: WASTE AND BUILT ENVIRONMENT
Solid and Liquid waste from residential and commercial buildings – Environmental significance – segregation and treatment of wastes – Industrial case studies – Experiments in construction industry – demolition – Role of NGOS in waste management.

UNIT-III: ALTERNATIVE BUILDING MATERIALS
Need for recycling industrial – byproducts as alternative building materials – use of fly ash, Furnace slag, Quarry dust, silica fume, waste lime and gypsum – Technology required for manufacturing – specification and application in construction industry.

UNIT-IV: RECYCING OF WASTES
Meaning of sustainable approach – Identification and workability of waste - Concept of recycling Solid and Liquid wastes in building industry – Solid waste recycling, Vermi Composting, Biogas production – Liquid waste recycling methods and practices

UNIT-V: ENVIRONMENTAL MANAGEMENT AND ENERGY OPTIONS

Degradation of environment due to waste – Salient features of environmental laws – Rain water harvesting techniques - Biological and Thermal energy options – Refuse derived fuel and other options.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- To acquaint with knowledge on present practices and current scenario of different types of waste management in India.
- To understand sustainable approaches in waste management
- To apply environmental laws which helps in adopting sustainable design techniques to control degradation of environment.

REFERENCES:

1. Ravindrarajah, R.S, Tam. T.C. Properties of concrete made with crushed concrete a coarse aggregate, - Magazine of concrete Research, Vol-37, and March 1985.
2. Arceivala. S.J., "Wastewater Treatment for pollution Control"- Tata-McGraw Hill, New Delhi, 1986.
3. ERM.UK Municipal Solid waste Management, Study for the MMA-Vol-1 Interim Report, August-1995.
4. R.Ambalavanan and A.Roja "Feasibility Studies on Utilisation of Wastelime, Gypsum with Fly Ash - The Indian concrete Journal – Vol. – 70 Nov-1996.

Subject: FURNITURE AND PRODUCT DESIGN		
Code : ARE507-2	**Credits : 2**	**Hours / Week : 2**
Progressive Marks : 50	**Examination Marks : 50**	**Duration of Exam: 2 hrs.**

AIM:

The course provides a framework in understanding the Theoretical, historical functional and human issues of the subject.

OBJECTIVE:

To impart a comprehensive understanding of the general theory and practice of the subject. To inculcate in student a natural curiosity in allied discipline of design.

COURSE CONTENT:

UNIT–I
Understanding of the functional and formal issues in design – study and evaluation of popular dictums such as "Form follows function", form and function are one", "Less is more", "God is in details" etc. Evaluation of visual design for functional objects. Gestalt theory of design: Law of closure, law of proximity, law of continuity etc.

UNIT–II
Human factors engineering and Ergonomic considerations; Principles of Universal Design and their application in furniture and product design.

UNIT–III
An introduction of various manufacturing processes most frequently adopted in furniture and product design such as, Injection Moulding; investment casting, sheet metal work, die-casting, blow- moulding, vaccum – forming etc

UNIT – IV
Signage and Graphics – Environmental graphics: signage categories and materials.

UNIT – V
A detailed study involving the design aspects of any one of the following: Lifestyle accessories, Luminaire design, a piece of furniture, Point of Purchase design, Signage.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- To acquaint with knowledge on various materials and manufacturing process which helps them in developing creative and convenient furniture designs.
- To understand Principles of Universal Design and their application in furniture and product design.
- To apply ergonomics in designing products with maximum comfort, safety and health
- To acquaint with knowledge on advantage of emerging technologies in the field of interiors and architecture.

REFERENCES

1. Héctor Roqueta. Product design, London: te Neues, 2002.
2. Morley, John. The history of furniture: twenty-five centuries of style and design in the Western tradition, Boston: Little, Brown and Company, 1999.
3. Aronson, Joseph. The Encyclopedia of Furniture, 6thprinting, New York: Crown Pub. 1944.
4. Saville, Laurel. Design secrets: furniture, Gloucester, Mass.: Rockport Publishers, 2006.
5. Datschefski, Edwin. The total beauty of sustainable products, Hove: Rotovision, 2001.
6. Papanek, Victor J. The green imperative: natural design for the real world, New York: Thames and Hudson, 1995.

Subject: ARCHITECTURAL JOURNALISM AND PHOTOGRAPHY		
Code: ARE507-3	**Credits: 2**	**Hours / Week: 2hrs**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 2 hrs**

AIM:

The Course prepares ground for the students to develop critical thinking and analyzing about the effects of architecture on society as well as the tools to enable recording of the same and develop the skill to create articles/presentation capturing the essence through the photographs.

OBJECTIVES:

- To provide basic introduction to the skills relevant to the practice of professional journalism.
- It introduces students to the fundamentals of writing, explaining of various strategies and their criticism.
- Introduction to Photo journalism and the contributions of photography to the professional practice of architecture and develop proficiency in this art using modern photography techniques.

COURSE CONTENT:

UNIT–I: INTRODUCTION

Introduction to journalism, key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism - Journalism skills: research, reporting, writing, editing, photography, columnists, public relationships, criticism. Issues such as copyright, public art policy, the arts and urban redevelopment. Introduction to local culture scene.

UNIT–II: TECHNOLOGIES IN JOURNALS

Environment, Social Change, Persuasion- Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking. Introduction to software needed in journalism and photography, video coverage, walk-through of buildings, production of contemporary architectural journalism. Understanding the individual demands in the context of newspapers, radio, film, and television.

UNIT–III: CONTEMPORARY ARCHITECTURAL JOURNALISM

Role of the Editor - Editing of Articles, Features and other stories - Editing for online newspaper and magazines - Text preparation, Mode of presentation, Standards and Guidelines for documentation, Code of ethics, Basic knowledge on Press laws, Press Council of India, Multimedia/online journalism and digital developments.

UNIT–IV: INTRODUCTION TO ARCHITECTURAL PHOTOGRAPHY

Introduction to architectural photography, history of architectural photography and role of the photographic image in the global world– basic instruction in Architectural Photography Equipment: cameras and lenses – techniques: film speed, exposure measurement, gray scale–photo- finishing and editing digital images. Perspectives: Single Point, Two- Point, Three- Point and methods of correcting distortions –Lighting: External and Interior. Photographic Practices – Realization, Light and Lighting, Exposure Metering and introduction to RAW format.

UNIT-V: PHOTO JOURNALISM

Definition of Photo Journalism - Brief History - Photographs as social Documentaries - Birth of modern Photo Journalism since 1950s - visual awareness – visual survey - EDFAT methods in using the camera - Equipment required for Photo Journalism. Photo Journalism in perspective - Snap shots - Advance amateur Photography - Art Photography - Photo Journalism - Approach to Photo Journalism – News Papers and Magazine Design elements: Page make -up - Layout - color scheme - Font - Blurb - Pictures – Ads - Other magazines - Documenting of Places - Rural- Urban - Public relations.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- To acquaint with knowledge on different techniques and processes used in documentation in terms of photography, exploration and research.
- To develop skills in design interpretation, perceptional thinking, and creative writing.

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TEXT BOOKS:

1. De Mare, Eric Samuel. Architectural photography, London: Batsford, 1975.
2. Edward Jay Friedlander and John Lee, “Feature Writing for Newspapers and Magazines”, 4th edition, Longman, 2000.
3. Kopelow, Gerry. How to photograph buildings and interiors, 3rd ed. New York: Princeton Architectural Press, 2002.
4. Fuller, David & Waugh, Patricia eds., “The Arts and Sciences of Criticism”, Oxford: Oxford University Press, 1999.
5. Mohd, Al Asad. Architectural Criticism and Journalism Sommer, Robert. Tom Wolfe on Modern Architecture.
6. Foust, James, Online Journalism, “Principles and Practices of News for the Web”, Holcomb Hathaway Publishers, Scottsdale, AZ, 2005.
7. M. Harris, “Professional Architectural Photography”, Focal Press, 2001.
8. M. Harris, “Professional Interior Photography”, Focal Press, 2002.

REFERENCES:

1. Huckerby, Martin., The Net for Journalists: A Practical Guide to the Internet for Journalists in Developing Countries. UNESCO/Thomson Foundation/ Common wealth Broadcasting Association, 2005.
2. Ward, S. J. A. “Philosophical Foundations of Global Journalism Ethics.” Journal of Mass Media Ethics., Vol. 20, No. 1, 3-21, 2005.
3. M. Heinrich, “Basics Architectural photography”, Bikhauser Verlag AG, 2008.
4. Gerry Kopelow, “Architectural Photography: the professional way”, 2007Busch, Akiko. The photography of architecture: twelve views, New York: Van Nostrand Reinhold Co., 1987.

Subject: COST EFFECTIVE TECHNOLOGY		
Code: ARE507-4	**Credits: 2**	**Hours / Week: 2**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 2 hrs.**

AIM:

To expose students into the cost-effective materials and construction techniques.

OBJECTIVE:

To make the students aware of the use of conventional and non-conventional resources for cost effective construction techniques.

COURSE CONTENT:

UNIT–I: INTRODUCTION
Introduction to cost effective buildings construction, techniques, system. Case study of cost-effective building project.

UNIT–II: BUILDING TECHNIQUES
An introduction to the subject to understand the various building techniques adopted in different climatic zones of the country, which resulting in varied vernacular expressions. Use of cost-effective technologies through the use of local materials, up gradation of traditional technologies, prefabrication etc.

UNIT–III: COST EFFECTIVE CONSTRUCTION
Need for cost effective construction, both in the rural and the urban sectors. Innovations of building techniques for cost effective construction. Analysis of space norms for cost effective buildings.

UNIT–IV: COST EFFECTIVE MATERIALS
Concepts of cost-effective materials Soil, Fly ash, Ferro cement, Lime, Fibres, Stone Dust, Boulders and oversize metal, Bitumen etc.

Cost effective building material products: - (a) Walls – Stabilised and sun dried, soil blocks & bricks, Hollow concrete blocks, stone masonry blocks, Ferrocement partitions. (b) Roofs – Precast R.C. Plank & Joists roof, precast channel roof, Precast L-panel roof, Precast Funicular shells, Ferrocement shells, Filler Slab, Seasal Fibre roof, improved country tiles, Thatch roof.

UNIT–V: COST EFFECTIVE CONSTRUCTION TECHNIQUES AND EQUIPMENT
(a) Techniques: - Rat trap bond construction, Precast R.C. and Ferro cement technique, Mud Technology. (b) Equipments: Brick moulding machine, Stablilised soil block making machine and plants for the manufacturing of concrete blocks. (c) Cost effective Roads.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Acquaint with knowledge on cost reduction by using improved skills and technologies without sacrificing quality of structure.
- Gain insight on reduction of energy consumption using different techniques.
- Understand principles of sustainable construction practices by using green / sustainable and locally available materials

REFERENCES:

1. Building System for Low Income Housing - A.K. Jain
2. Low Cost Housing in Developing Countries- G.C. Mathur
3. Alternative Building Materials and Technologies – By K S Jagadeesh, B V Venkatta Rama Reddy & K S Nanjunda Rao – New Age International Publishers
4. Integrated Life Cycle Design of Structures – By Asko Sarja – SPON Press
5. Non-conventional Energy Resources – By D S Chauhan and S K Sreevasthava – New Age International Publishers.
6. Buildings How to Reduce Cost – Laurie Backer - Cost Ford

YEAR III SEMESTER - VI

Subject: ARCHITECTURAL DESIGN - V		
Code: ARS601	**Credits: 10**	**Hours / Week: 12 hrs**
Progressive Marks: 100	**Examination Marks: 1000**	**Mode of Exam: Jury**

AIM:

To enable student to confidently design large complex buildings and campuses, which involves structural synthesis, effective movement systems, within and around buildings, complying with all rules and regulations demonstrated in at least two large projects. Stress also shall be on making such buildings barrier free in terms of movement and details.

OBJECTIVES:

- Understand the design principle of campus planning and large scale projects
- Designs have to respond to climate environmental and ecological factors. Site planning, landscape details, circulation and services, structural viability and interiors have to be addressed.
- To make the student understand the complexity, functioning and salient features of the design project through organizing field visit, train them to document and present the findings.

DESIGN STUDIO:

Design of large structures - Multiuser, multi-span, multilevel (six to eight floors) - building types involving technology and services – Design and detailing for movement and use by physically handicapped people within and around building.

Examples: Institutional, Resorts, IT hubs, Recreational - Mixed use Developments etc.
-Working drawings for any one design Using Computer for presentation Skills

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Acquaint with knowledge on the basic functional aspect of designing complex building types, its relevant site planning and spatial organization.
- Understand different building byelaws, standards and apply the same in designing.
- Gain insight on vertical planning and services of high-rise buildings

REFERENCES:

1. Ed.By.Quentin Pickard RIBA - The Architects' Hand Book - Bladewell Science Ltd. – 2002.
2. De Chiara Callender, Time Saver Standard for Building Types, McGraw-Hills Co., 1973.
3. Edward D.Mills, Planning, 4 volumes, Newnes, Butterworths, London, 1976. P&D Act 1995.
4. E and O.E. Planning. Lliffee Books Ltd., London, 1973.
5. National Building Code and Bureau of Indian standard publication

Subject: Working Drawing & Detailing		
Code: ART602	**Credits: 4**	**Hours / Week: 6 hrs**
Progressive Marks: 100		

AIM:

The aim is to impart skills related to the preparation of drawings meant for construction work on the site and to improve the students' ability of detailing.

OBJECTIVES:

- To impart training in the preparation of working drawings for buildings with specific reference to code of practice as per IS Code No. 962 of 1969 and incorporating specifications as complementary to the working drawings.
- To sensitize the students in preparing finer design details required for buildings.

COURSE CONTENT:

UNIT–I: FLOOR PLANS
Preparation of working drawings: Suitable scales of drawings, methods of giving dimensions: on plans, sections, elevations and other standards. Preparation of Plans Building marking plan, centerline plan, foundation plan, column centerlines drawings, floor plans, terrace floor plan.

UNIT–II: ELEVATIONS AND SECTIONS
Elevation and Sections, Detailed elevations, detailed sections, at least one through staircase and one through toilet, typical wall profile sections and elevations

UNIT–III: LAYOUTS
Furniture Layout, Electrical Layout, Sanitation and Water supply Layout

UNIT–IV: BUILDING COMPONENT DETAILS
Detailing of architectural elements such as staircase, balcony and verandah, shading devices vertical and horizontal components of the building

UNIT-V: DETAILS
Detailing of Doors, windows, and detailed plans, staircases, toilets and kitchens other fixing details, Compound walls, Grills and Balcony railing

NOTE: The above drawings need to be prepared for one design project of any semester handled in an earlier Architectural design studio.
The drawings need to be prepared using any of the CAD techniques and final presentation to be submitted as a hardcopy.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Familiarize with the drawings which are prepared for the actual construction/ execution of the buildings.
- Gain insight on types of technical drawings which are used in the construction and architecture process.
- Produce architectural drawings with the appropriate standards, symbols and conventions for building construction.

REFERENCES

1. Lerrs, Jack. Engineering Construction Specification.
2. Liebing, W. Ralph and Raul, Ford Mimi. Architectural Working Drawings, 2nd ed. John Wiley and Sons, New York, 1983.
3. Macey, W. Frank. Specification in Detail, 5th ed. Technical Press ltd, London, 1955.
4. Shah, M.G., and Others. Building Drawing: with an integrated approach to build environment, 3rd ed. Tata McGraw Hill Pub., co. Ltd, New Delhi,1996.
5. Lewis, R. Jack. Building Construction Specifications. Prentice-Hall, Inc., New Jersey, 1975.
6. Govt. of Maharashtra. Standard Specifications, Government Press, Nagpur, 1972.
7. Datta, B.N. Estimating and Costing in Civil Engineering: Theory and Practice, 23rd ed. UBS Pub. New Delhi, 1993.
8. Wakita, Osamu A. & Linde, Richard M. The professional practice of architectural detailing, 2nd ed. New York: Wiley, 1987.
9. Robert, C. Mc Hugh. Working Drawing Hand Book, New York: VNR, 1977.

Subject: Ecology and Landscape		
Code: ART603	**Credits: 2**	**Hours / Week: 3 hrs**
Progressive Marks: 50	**Examination Marks: 50**	**Mode of Exam: 2 Hrs**

AIM:

This course introduces students to landscape design and site planning and relate it to design and planning of built environments. It provides an overview of development of landscape design, site studies, plant studies and application of the knowledge at various levels of design.

OBJECTIVES:

- To develop a conceptual understanding of landscape design and site planning principles.
- To develop skills in integrating landscape design with built environments.

COURSE CONTENT:

UNIT–I: INTRODUCTION & EVOLUTION OF LANDSCAPE ARCHITECTURE

Landscape as a broad terminology, Natural and Man-modified landscapes.
Brief history and the growth of landscape architecture as a design and planning profession from gardens to regional landscapes. Evolution of concepts in landscape design after the industrial revolution leading to new theories in integrating built spaces to open spaces. Scope and nature of professional work in contemporary landscape architecture, changing priorities of disciplinary approach: ecology, biodiversity and sustainability.

UNIT-II: ARCHITECTURE AND LANDSCAPE, SITE ANALYSIS AND SITE PLANNING

Study of architectural response to landscapes and understanding the relation between architecture and landscape through case examples. The idea of site as part of whole/larger landscape, Site inventory and analysis: physical, biological, social contextual studies and layers of site analysis, site suitability analysis, inferences and response for architectural interventions. Design considerations and approaches to site planning, site program, siting of buildings and open spaces, introduction to grading and land modifications, working with sloping sites. Demonstration of understanding of site analysis and site planning through studio exercise.

UNIT-III: PLANTS & DESIGN

Plants and Design - Introduction to study of plants in relation to landscape design and architecture. An overview of use of plants in history. Study of Plant material – Botanical Nomenclature anatomy and physiology of plant growth study of trees, shrubs, ground cover, indoor plants in Indian context.

Design with plants – Basic principles of designs. The physical attribute of plants and relation to design. Appearance, functional and visual effects of plants in landscape design and built environment, Selection and management of plant material in relation to built environment.

UNIT–IV: ELEMENTS OF LANDSCAPE DESIGN

Elements in Landscape Design - Use of landform, water and vegetation in landscape design. Hard landscapes: design of paths, roadways streets, terraces etc and use of land form effectively. Soft landscapes: design of lawns, shrubs, hedges, trees – in relation to buildings and other landscape elements.

Design concepts related to use of sculpture, outdoor lightings, Architectural feature, street furniture and grouping them into meaningful compositions for visual and functional effects.

UNIT–V: LANDSCAPE CONSTRUCTION & SERVICES

Landscape construction and engineering details, preparation of landscape Schemes. Landscape Construction and Services - Study of landform its technical expression through grading plan, sections and earthwork computations. Construction of structure in landscape circulation roads, parking, paths, level changes – walls, steps lamps, construction of screens, trellis, wall fences gales decks, pools etc.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Acquaint with knowledge on elements of landscape and the scope of landscape architecture in practice
- Understand the impact of human activities on the environment and the role of architect in mitigating it
- Develop and strengthen the competence in dealing with the analytic, artistic and technical aspects of designing open spaces at different scales..
- To develop design integrating landscape design with built environments with large scale projects and master planning

EXERCISES:

Exercise on ‘relating architecture and landscape’ may be undertaken as a literature study exercise.

Each unit can entail a small design studio exercise so that the students can get better understanding of the topics or any other relevant exercises appropriately framed by the subject faculty.

For example:

Unit I – Study the different influences of historical gardens in modern day landscapes
Unit II – Document the site analysis for a large-scale project like an institution or office building and propose a master plan.
Unit III – Design a garden only using plant material in various climatic conditions and zones
Unit IV – Design a terrace garden or roof garden using the various elements only
Unit V – Grading exercise to create a natural looking water body.

REFERENCES:

1. Michael Laurie, *an Introduction to Landscape Architecture*, Elsevier, 1986.
2. Geoffrey and Susan Jellicoe, *the Landscape of Man,* Thames and Hudson, 1987.
3. TSS for *Landscape Architecture*, Mc Graw Hill, Inc, 1995
4. Grant W Reid, From Concept to Form in *Landscape Design*, Van Nostrand Reinhold Company, 1993.
5. Brian Hacket, *Planting Design*
6. T.K. Bose and Chowdhury, *Tropical Garden Plants in Colour*, Horticulture and Allied Publishers, Calcutta, 1991.
7. Ian McHarg, *Design with Nature*, 1996

Subject: DESIGN OF STEEL STRUCTURES		
Code: ART604	**Credits: 3**	**Hours / Week: 3 hrs**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 3 hrs**

AIM:

To understand the Structural Design of different elements of Industrial Building in Steel

OBJECTIVES:

- To learn the behavior and properties of structural steel
- To introduce analysis and design of structural steel connections and their detailing
- To introduce design of axially loaded and flexural steel members and their detailing as per IS:800-2007
- Case studies and models wherever applicable.

COURSE CONTENT:

UNIT-I: Structural Steel and Sections:

Engineering properties and characteristics, Types of sections, Rolling process – necessity and importance, Specifications, Advantages and disadvantages. Loads and loading standards.

UNIT-II: Connections:

Bolted connections – Types of bolts, specifications, Strength, Pitch, Gauge and edge distances, Bolt value, Analysis and design of bolted connections subjected to direct axial loadings, Detailing

Welded connections – Types of welds, specifications, strength, continuous and intermittent welds, Design of welded connections subjected to direct axial loadings, Detailing

UNIT-III: Tension Members

Types of tension members, sectional areas, types of failure, design strength, Design of tension members, Detailing, Introduction to lug angles and splices

UNIT-IV: Design of Axially Loaded Compression Member and Slab Base:

Types of section, Section classification, Column formulae, Buckling classification. Design of axial compression members, Design of column slab base and concrete foundation, Detailing

UNIT-V: Design of Flexural Members

Concept of lateral restraint, Laterally supported and unsupported beams, Section classification, Elastic and plastic sections modulus, IS criteria for design, Design of simple laterally restrained beams, Detailing, Introduction to plate girder.

Note:

Use of IS: 800 and Steel Tables are permitted in examination.

COURSE OUTCOME:

The student has the

- knowledge of the behavior of steel as structural material and analysis of various loads and design philosophies as applied to structural steel.
- ability to analyze and design tension members and their connections

- ability to analyze and design axially loaded compression members including bases & foundations.
- ability to analyze and design flexural members.

TEXT BOOKS:

1. Limit State Design of Steel Structures S. K. Duggal, Tata McGraw Hill Education Private Limited, New Delhi, India, 2015.
2. Design of Steel Structures By Limit State Method by S. S. Bhavikatti, as Per IS: 800—2007, Second Edition, I K International Publishing House, India, 2010.

REFERENCES:

1. Design of Steel Structures by N. Subramanyam, Oxford University Press, New Delhi, india, 2008.
2. Design of steel structures-1 by Rama Chandra and Virendra Gehlot, Scientific Publishers, india , 2009
3. Design of Steel Structures by P. Dayarathnam, Prentice Hall India, New Delhi, india, 2011
4. IS: 800-2007- General Construction in Steel – Code of Practice, (Third Revision).
5. IS: 875, steel tables and other relevant codes.

Subject: ESTIMATION, COSTING & VALUATION		
Code: ART605	**Credits: 3**	**Hours / Week: 3Hrs.**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 2 hrs**

AIM:

To provide the in-depth knowledge about various methods of quality surveying, rates analysis of building and valuation and specifications for different materials used.

OBJECTIVES:

- To provide the knowledge about importance of specification, how to write specification – important aspects of the design of a specification.
- To know the concept of abstract and detailed estimates based on measurement of materials and works.
- To provide knowledge about cost control and about valuation and depreciation
- Writing feasibility report of a project.

COURSE CONTENT:

UNIT-I: SPECIFICATION
Definition, purpose and importance of specifications, General or brief specifications, Detailed specifications, writing of specifications, for items like earthwork excavations, foundation, CRS masonry, DPC, PCC, RCC, brickwork, doors and windows (wooden), mortars, plaster, painting, flooring like terrazzo flooring and tiles, ceramic tiles, marble, granite, distemper, snowem, glazing, specification, writing to include materials, tests pre and post installation, modes of measurements.

UNIT-II: ESTIMATION
Types & purpose, approximate estimate of buildings – Bill of quality, factors to be considered, Principles of measurement and billing, contingencies, measurement of basic materials like brick, Wood, concrete and unit of measurement for various items of work – abstract of an estimate.

UNIT-III: DETAILED ESTIMATE
Deriving detailed quantity estimates for various items of work of a building. Like earthwork excavation, brick work, plain cement concrete, Reinforced cement concrete works, wood work, iron works, plastering, painting, flooring, weathering course for a single storied building.

UNIT-IV: RATE ANALYSIS
Cost of materials and labour for various works, data sheet for different items of works, different methods of execution i.e. piece work, daily basis, lump sum, labour rates and percentage etc.

UNIT-V: VALUATION

Introduction- state the purposes of valuation of building explain the terms, market value, book value, capital cost, capitalized cost, years of purchase, list out various methods of estimating the depreciation of building properties, calculate the value of the property by different methods. Methods of contracting and its link to specification drafting - the Business Environment and the Structure in practice.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Prepare detailed material specification for building construction.
- Prepare detailed /approximate estimate for small scale building projects and affordable housing.
- Acquaint with knowledge on rate analysis of materials, labour for various works, valuation and depreciation.

TEXT BOOK:

1. S.C. Rangwala, "Estimating, Costing and Valuation(Professional practice)", 1984
2. B.W. Dutta, "Estimating & Costing" (Revised by S. Dutta), UBS Publishers Distribution P.Ltd. India, 1983
3. M. Chakraborti, "Estimating Costing and Specification", 1984
4. Gurcharan singh & Jagdish singh, "Estimating Costing and Valuation", Standard Publishers Distributors, 2012

REFERENCES:

1. T.N. Building practice, Vol:1 Civil Govt Publication.
2. PWD Standard Specifications. Govt Publication, 2012.

ELECTIVE-III

Subject: Sustainable Architecture		
Code: ARE606-1	**Credits: 2**	**Hours / Week: 2 hrs**
Progressive Marks: 50	**Examination Marks: 50**	**Mode of Exam: 2 Hrs**

AIM:

To make the student understand the challenges, strategies of sustainability, materials to use and future trend for sustainable development.

OBJECTIVES:

- To inform the need to use alternative sources of energy in view of the depleting resources and climate change.
- To familiarize the students with simple and passive design considerations
- To inform about the importance of day lighting and natural ventilation in building design
- To make the students aware of the future trends in creating sustainable built environment.

UNIT-I: INTRODUCTION TO SUSTAINABLE ARCHITECTURE

Definition of sustainable architecture, need, scope & study of, Natural resources & their interrelationship, Historical Perspective: Natural & Physiological factors influencing human civilizations & Settlements

UNIT-II: CHALLENGE OF SUSTAINABLE DEVELOPMENT

Introduction to sustainability, its historical precedence global & local relevance - its correlation to population growth & consumption patterns Human Impact on Earth sustainability: Impact of human civilization on the earth's major ecosystem forests, oceans, & atmosphere;

UNIT-III: STRATEGIES FOR SUSTAINABILITY

Principles of conservation & efficiency as applied to space, energy and material resources; Global treaties & action plans; sustainable role models such as eco-villages; environmental education

UNIT-IV: SUSTAINABILITY APPLICATIONS TO ARCHITECTURE AND PLANNING

Sustainable Architecture and Planning. Preserving and improving the human settlement in harmony with nature. Conservation of natural resource for improving the quality of life on earth and attempting to ensure its continuity for the future of humanity. Eco cities, eco-communities and eco buildings: Archeology. Designing settlements and other man-made eco-systems. Ecological and environmental cities for sustainable future.

UNIT-V: USE OF SUSTAINABLE MATERIALS

Interior materials Green materials and Construction Technology Insulation, paint, wiring; Smart building systems, Technical Standards & Certifications systems: Types of certification systems worldwide – LEEDS, BREEAM, ECOTEL, GREEN GLOBE, ENERGY STAR etc.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Expose to alternative sources of energy and to passive design considerations
- Familiarize principles of day lighting and natural ventilation in building design
- Acquaint with knowledge of sustainable architecture examples of various local, national and global project through case studies.

REFERENCES:

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

WEBSITES

www.terin.org/
http://solstice.crest.org/efficiency/index.shtml
http://www.envinst.conu.edu/~envinst/research/built.html

Subject: CONSTITUTION OF INDIA		
Code: ARE606-2	**Credits: 2**	**Hours / Week: 2 hrs.**
Progressive Marks: 50	**Examination Marks: 50**	**Duration of Exam: 2 hrs.**

AIM:
To make students to understand the constitution of Indian- various functions and role of important authorities

OBJECTIVE:
Introduction to the Constitution of India

COURSE CONTENT:

UNIT-I: EVOLUTION OF CONSTITUTION OF INDIA
Preamble to the Constitution of India – Evolution of Constitutional Law. Scope and Extent of Fundamental Rights under Part III – Details of Exercises of Rights, Limitations and Important Cases
UNIT-II: DIRECTIVE PRINCIPLES OF STATE POLICY
Relevance of Directive Principles of State Policy under Part IV.
Significance of Fundamental Duties under part IV (a)
UNIT-III: ROLES AND FUNCTIONS OF AUTHORITIES
Union Executive, President, Vice-President, Prime Minister, Council of Ministers, Parliament and Supreme Court of India. State Executive, Governor, Chief Minister, Council of Ministers, Legislature and High Courts. Constitutional provisions for scheduled castes and tribes; women and children and backward classes.
UNIT-IV:
Emergency Powers, Major Constitutional Amendments.
UNIT-V:
Electoral Process

COURSE OUTCOME:
. On successful completion of this course, the student should be able to:

- Understand the constitutional laws of India enabling the students to enhance the knowledge of fundamental rights of citizen

- Distinguish the role and importance of different authorities.
- Acquaint the significance of Fundamental Duties.

REFERENCE BOOKS:

1. "Introduction to the Constitution of India (Student Edition)" by Durga Das Basu
2. "Constitution of India – Latest Edition" by VN Shukla

Subject : Theory of Design		
Code : ARE606-3	**Credits : 2**	**Hours / Week: 2 hrs**
Progressive Marks : 50	**Examination Marks : 50**	**Mode of Exam : 2 Hrs**

AIM:

The courses in design theory aim to evolve a conceptual framework for intelligent appreciation of Architecture and to develop a vocabulary for discussing design ideas.

OBJECTIVES:

- To understand design and the role of the designer in changing society.
- To familiarize the students with methodologies, theories and models of the design process.
- To inform students about the term creativity and introduce techniques which will enable creative thinking.
- To inform the approaches to generate ideas for architectural design and the importance of the participatory approach to design.

COURSE CONTENT:

UNIT-I: INTRODUCTION TO DESIGN
Definition and understanding of design- design in history - changing role of designer on society -different classifications of design according to scale, process, mode of production, etc.

UNIT-II: DESIGN METHODOLOGY MOVEMENTS
Context for the rise of the design methodology movement- theories of the first generation and the second-generation design methodologists- various models of the design process- focus on the design problem: ideas of escalation/regression and wicked problem.

UNIT-III: CREATIVE THINKING
Understanding the term creativity- theories on thinking: left brain/ right brain, convergent and divergent thinking, lateral and vertical thinking- design spectrum from the logical to chance - Blocks in creative thinking- various techniques to generate creativity

UNIT-IV: ARCHITECTURAL CREATIVITY
Design puzzles and traps - approaches to generate ideas for architectural design - types of Concepts - personal philosophies and strategies of individual designers - channels to creativity in architecture. Value judgments in design. Appreciation of designer skills, theories of perception and variability of perception

UNIT-V: DESIGN AND PEOPLE
Concept of pattern language- participatory approach to design - design as process

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Acquaint with methodologies, theories and models of the design process.
- Address contemporary issues in an independent and creative way.
- Acquaint with the techniques of creative thinking

TEXT BOOKS:

1. Geoffrey Broadbent, "Design in Architecture, Architecture and the Human sciences", John Wiley & Sons, New York, 1981.
2. Bryan Lawson, "How Designers Think", Architectural Press Ltd., London, 1980.
3. Anthony Antoniades, "Poetics of architecture", Theory of design, John Wiley & sons, 1992.
4. Paul - Alan Johnson, "Theory of Architecture: Concepts, Themes", Wiley 2008 VNR, 1994
5. Christopher Alexander, "Pattern Language", Oxford University Press, 1977

REFERENCES

1. Edward De Bono, "Lateral Thinking", Penguin, 1990.
2. Christopher Jones "Design methods", Wiley, 1980.
3. Tom Heath, "Method in Architecture, John Wiley & Sons, New York, 1984.
4. Nigel Cross, "Developments in Design Methodology", John Wiley & Sons, 1984.
5. Helen Marie Evans, Dumesnil, Carla Davis, "An Invitation to Design", Macmillan Publishing Co., New York, 1982.

Subject: Structure and Architecture		
Code: ARE606-4	**Credits: 2**	**Hours / Week: 2 hrs**
Progressive Marks: 50	**Examination Marks: 50**	**Mode of Exam : 2 Hrs**

AIM:

To study the structural construction methods during industrial era, present and future trends in different regions of world.

OBJECTIVES:

- To study evolution of structural systems through history.
- To familiarize the students with concepts of structural design through works of architects/ engineers.
- To study architectural expression through relevant case studied.
- To evaluate the understanding of the relationship between form & structure through a seminar.

COURSE CONTENT:

UNIT-I: HISTORY OF STRUCTURAL DESIGN IN THE PRE-INDUSTRIAL ERA

Development of monolithic and rock cut structures- trabeated construction-arcuate construction Vaults and flying buttresses- tents and masted structures and bridges through ancient and medieval history.

UNIT-II: HISTORY OF STRUCTURAL DESIGN IN THE POST-INDUSTRIAL PERIOD

Post Industrial modular construction of large span and suspension structures in steel and concrete- projects of Pier Nuigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen.

UNIT-III: CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – I

The select case studies could include KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park, Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Normal Foster and Standsted Airport Terminal, London, UK by Fosters/Arup British Pavilion EXPO 1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw

UNIT-IV: CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – II

The select case studies could include Inmos Microchip Factory, Centre Commercial St. Herbtain, PA Technology, Princeton and Fleetguard, Quimper UK by Richard Rogers Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen , Railway Station, Lyon, France and Stadelhofen Railway station, Zurich Schweiz by Santiago Calatrava Kansai International Airport, UNESCO Workshop, the Jean-Marie Tjibaou Cultural Center, Menil Museum, Thomson Optronics Factory, IBM Traveling Exhibition Pavilion, Columbus International Exposition, Genoa Italy and Lowara Officers, Montecchio Maggiore Italia by Reno Piano Building Workshop

UNIT-V: SEMINAR

Seminar to present a study of architectural form and structural expression through select cases which will aid understanding of structural philosophy and analysis, building envelope and services and construction sequence.

COURSE OUTCOME:

On successful completion of this course, the student should be able to:

- Acquaint with knowledge principles of building envelope design and construction sequence.
- Understand and familiarize the concepts of structural design and its impact/ functional dimension in the architectural design of the historic and contemporary buildings.
- Acquaint with the architectural expression, its relation between form and structure through relevant case studies.

TEXT BOOKS:

1. Shigeru Ban,McQuaid, Matilda, Engineering and Architecture: Building the Japan Pavilion, Phaidon Press Ltd, UK, 2008
2. Cox Architects, The images publishing group, Australia, 2000
3. Masted structures in architecture, James B Harris, architect. Kevin Pui-K Li, Oxford; Boston: Architectural Press, 2003

REFERENCES:

1. Martorell, Bohigas & Mackay, Pavilion of the Future, Expo 92, Seville (MBM), 1992.
2. P. COX, Daring Harbour Expo Center, Sydney Australia
3. Enric Miralle & Carme Pinos, Olympic Archery Building, 857072 COH
4. Prada Aoyama Tokyo Herzog & De Meuron. Milan,IT: Progetto Prada Arte Srl, 2003
5. Christopher Beorkrem, Material Strategies in Digital Fabrication, Routledge,Taylor & Francis Group, 2013