**THIRUVALLUVAR UNIVERSITY**

**MASTER OF SCIENCE**

**M.Sc. INTERIOR DESIGN AND DECOR**

**DEGREE COURSE**

**CBCS PATTERN   
(With effect from 2020-2021)**

**The Course of Study and the Scheme of Examinations**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Study Components** | | **Ins. Hrs / week** | **Credit** | **Title of the Paper** | **Maximum Marks** | | |
| **Course Title** | |
|  | **SEMESTER I** | | | | | **CIA** | **Uni. Exam** | **Total** |
|  | CORE | Paper-1 | 5 | 4 | Introduction to Design and Design Techniques | 25 | 75 | 100 |
|  | CORE | Paper- 2 | 6 | 4 | |  | | --- | | Principles of Resource Management | | 25 | 75 | 100 |
|  | CORE | Paper- 3 | 6 | 4 | Advanced landscape design | 25 | 75 | 100 |
|  | CORE PRACTICAL | Practical-1 | 3 | 0 | Advanced landscape design | 0 | 0 | 0 |
| **Internal Elective for same major students** | | | | | | | | |
|  | CORE ELECTIVE | Paper-1 | 5 | 3 | |  | | --- | | **(to choose one out of 3)**  A. Traditional Interiors  B. Renewable Energy Resources  C. Art in Commercial Space | | 25 | 75 | 100 |
| **External Elective for other major students (Inter/multi disciplinary papers)** | | | | | | | | |
|  | OPEN ELECTIVE | Paper-1 | 5 | 3 | **(to choose one out of 3)**  A. Housekeeping and Front Office Management  B. Floriculture and floral art  C. Interior Decoration | 25 | 75 | 100 |
|  | **Sem. Total** |  | **30** | **18** |  | **125** | **375** | **500** |
|  |  |  |  |  |  |  |  |  |
|  | **SEMESTER II** | | | | | **CIA** | **Uni. Exam** | **Total** |
|  | CORE | Paper-4 | 5 | 4 | |  | | --- | | Research Methodology and Statistics | | 25 | 75 | 100 |
|  | CORE | Paper-5 | 4 | 4 | |  | | --- | | Space Planning in Interiors | | 25 | 75 | 100 |
|  | CORE | Paper-6 | 4 | 4 | |  | | --- | | Interior Decoration Perspectives | | 25 | 75 | 100 |
|  | CORE PRACTICAL | Practical- 1 | 3 | 3 | Advanced landscape design | 25 | 75 | 100 |
|  | CORE PRACTICAL | Practical- 2 | 3 | 3 | |  | | --- | | Advanced CAD in Interior Design | | 25 | 75 | 100 |
| **Internal Elective for same major students** | | | | | | | | |
|  | CORE ELECTIVE | Paper - 2 | 5 | 3 | |  | | --- | | **(to choose one out of 3)**  A. Furniture Design  B. Advanced Graphic Design  C. Innovation and Entrepreneurship | | 25 | 75 | 100 |
| **External Elective for other major students (Inter/multi disciplinary papers)** | | | | | | | | |
|  | OPEN ELECTIVE | Paper - 2 | 4 | 3 | **(to choose one out of 3)**  A. Landscape Design  B. Entrepreneurship Development  C. Art in Interiors | 25 | 75 | 100 |
|  | \*FIELD STUDY |  | - | 2 |  | 100 | - | 100 |
|  | Compulsory Paper | | 2 | 2 | Human Rights | 25 | 75 | 100 |
|  | **Sem. Total** |  | **30** | **28** |  | **300** | **600** | **900** |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **SEMESTER III** | | | | | | | **CIA** | | **Uni. Exam** | **Total** |
|  | CORE | | Paper- 7 | 5 | | 5 | Ergonomics in Interior Design | 25 | | 75 | 100 |
|  | CORE | | Paper- 8 | 5 | | 5 | Household Equipment | 25 | | 75 | 100 |
|  | CORE | | Paper- 9 | 5 | | 5 | Building materials and finishes | 25 | | 75 | 100 |
|  | CORE | | Paper- 10 | 4 | | 4 | |  | | --- | | Basics of Architecture | | 25 | | 75 | 100 |
|  | CORE PRACTICAL | | Practical-3 | 3 | | 0 | |  | | --- | | 3 ds max in Interiors | | 0 | | 0 | 0 |
| **Internal Elective for same major students** | | | | | | | | | | | |
|  | CORE ELECTIVE | | Paper-3 | 5 | | 3 | **(to choose one out of 3)**  A. Event Management  B. Interior Environment and Services  C. Organizational Behaviour | 25 | | 75 | 100 |
| **External Elective for other major students (Inter/multi disciplinary papers)** | | | | | | | | | | | |
|  | OPEN ELECTIVE | | Paper- 3 | 3 | | 3 | **(to choose one out of 3)**  A. Accessories in Interiors  B. Commercial interiors  C. Basics of Furniture Design | 25 | | 75 | 100 |
|  | MOOC COURSE | |  | - | | - |  | - | | - | 100 |
|  | **Sem. Total** | |  | **30** | | **25** |  | **150** | | **450** | **700** |
|  |  | |  |  | |  |  |  | |  |  |
|  | **SEMESTER IV** | | | | | | | **CIA** | | **Uni. Exam** | **Total** |
|  | CORE | Paper-11 | | | 5 | 5 | Professional Practice and Estimation | 25 | | 75 | 100 |
|  | CORE PRACTICAL | Practical -3 | | | 3 | 3 | 3 ds max in Interiors | 25 | | 75 | 100 |
|  | CORE | Project / Dissertation | | | 12 | 5 | Project with viva voce (compulsory) | 100 (75 project +25 viva) | | | 100 |
| **Internal Elective for same major students** | | | | | | | | | | | |
|  | CORE ELECTIVE IV | Paper- 4 | | | 5 | 3 | **(to choose one out of 3)**  A. Sustainable interiors  B. Advanced Resource Management  C. Green Consumerism | 25 | 75 | | 100 |
| **External Elective for other major students (Inter/multi disciplinary papers)** | | | | | | | | | | | |
|  | OPEN ELECTIVE IV | Paper- 4 | | |  | 3 | **(to choose one out of 3)**  A. Home Furnishings  B. Green Interiors  C. Alternative Sources of Energy | 25 | 75 | | 100 |
|  | **Sem. Total** |  | | | **30** | **19** |  | **100** | **300** | | **500** |
|  | **Course Total** |  | | |  | **90** |  |  |  | | **2600** |

**\* Field Study**

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registred by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

(i). Head of the respective department

(ii). Mentor

(iii). One faculty from other department

\*\***Mooc Courses**

Inclusion of the Massive Open Online Courses (MOOCs) with zero credits available on SWAYAM, NPTEL and other such portals approved by the University Authorities.

**SEMESTER III**

**PAPER - 7**

**ERGONOMICS IN INTERIOR DESIGN**

**Course Objectives**

To enable the students to

1. Become aware of the ergonomic principles for improving work efficiency.
2. Understand environmental comfort and discomfort in the work place.

**UNIT I**

Ergonomics – Concept, Definition, Human Factors, Principles of Ergonomics, Occupational factors affecting the worker. Human body structure and function. Work Station Design – Workplace and work space, Ergonomic Chair, Visual Display Terminal (VDT) - Ergonomic design of the office computer workstation. Work place design problems, General principles for workstation and workplace design.

**UNIT II**

Posture – Definition, Postures and job related postures adopted for different activities. Sitting, Standing, Lying down, Change of posture, Movement – Lifting, Pulling and Pushing, Problems of Posture – Kyphosis, Lordosis, Scoliosis and squatting. Exercises for Postural problems. Musculoskeletal Disorder (MSD) –Tendinitis, Joints, Ligaments. Arthritis, Carpel Tunnel Syndrome, Back, Neck – Structure, problem and its prevention.

**UNIT III**

Anthropometry - Definition, anthropometric dimension of workers at work and rest, normal, maximum vertical and horizontal reaches, Types of data – Static dimensions and Dynamic dimensions, Definition and Applicability of Stature - Eye height, Elbow height, Sitting height, Shoulder and Elbow breadth, Thigh clearance and Popliteal height, Maximum and Minimum Vertical and Horizontal reach.

**UNIT IV**

Work environment spatial requirement - anthropometric dimension of workers at work and rest, elbow room, clearance space for operating equipment, circulation space in rooms, corridors, floor space and work heights when seated and standing. Temperature - air movements, humidity, exchange of heat between human body and surroundings, comfort and discomfort, factors affecting comfortable temperature, ventilation, and requirement of air movement.

**UNIT V**

Lighting and Noise - Adequacy of lighting at work place, physiological requirement, psychological effect of lighting and the work efficiency of the worker. Flooring - thermal properties of flooring and their effects of physical condition at work, accident and safety. Noise - Definition, sources of noise, indoor and outdoor noise level, effects of noise on psychological and intellectual activities, measurement of noise.

**Text Book Reference:**

1. Aaras, A., HArgen, G., Bjorset, HS.Rao and Walsoe, H., (2001) Musculoskeletal, Visual and Psychological Stress in VDU operators before & after multidisciplinary ergonomic Intervention.
2. Barner, R.M. (1980), Motion and time study, Design and measurement of work. New York, John Wiley.
3. Bullock, (1990). Ergonomics – The physiotherapist in the work place, Churchill Livingstone Publishers, United Status.
4. Jhamb, (1991). Work study and Ergonomics At work, John Wiley.

**References:**

1. Julius Panero and Martin Zelnik, (1979). Human Dimension and Interior Space. Watson – Guptill Publications, New York.
2. Khan M.I., (2014). Industrial Ergonomics. PHI Learning Private Limited, New Delhi.
3. Umesh Prasad, (2011). Essential of Ergonomics. Sonali Publications, New Delhi.
4. Martin Helander, (2006). A Guide to Human Factors and Ergonomics. Taylor and Francis.
5. Manjit Kaur Chauhan, (2015). Ergonomics Practical Manual for Beginners. Authorspress, New Delhi.
6. Jan Dul and Bernard Weerdmeester, (2008). Ergonomics for Beginners – A quick reference guide, CRC Press, New York.
7. Tayyari. F and Smith J.L, (1997). Occupational Ergonomics – Principles and Applications, Chapman and Hall, Tokyo.

**E- Materials:**

* + - 1. <https://www.medicalnewstoday.com/articles/324071.php#summary>
      2. <https://www.healthyworkstations.com/resources/ergo/TakingMeasurements.pdf>
      3. <https://biologydictionary.net/anthropometry/>
      4. <https://www.ergonomics.com.au/what-is-ergonomics/>
      5. <http://www.ifad.org/evaluation/public_html/eksyst/doc/lle/pf/l124suse.htm>
      6. <http://www.adirondackdailyenterprise.com/page/blogs.detail/display/1428/Incentives-versus-Subsidies.html>
      7. <https://www.oktra.co.uk/insights/office-design-problems-and-how-to-solve-them/>

**Course outcome:**

After completion of the Course, the student will be able to

1. Use the concept of ergonomics design
2. Applying proper posture to avoid health issues.
3. Perform work space design considering physical space and inter personal space.
4. Design or Redesign Workstation using Ergonomically Knowledge.
5. Design work space considering physical space and inter personal space.

**PAPER - 8**

**HOUSEHOLD EQUIPMENT**

**Course Objectives:**

To enable the students to

1. Learn the uses and maintenance of labour saving devices and equipment in the home.
2. Gain expertise in technologies of energy production and efficient utilization.
3. Comprehend the working principles, use and care of labour appliances.
4. Understand the concept of various forms of renewable energy.

**UNIT I**

Growth and development in household equipment technology. Trends in equipment, kinds of equipment, Design and construction. Influence of household equipment in modern family life. Factors influencing the choice of consumer durables, general and specific factors, Material and construction, saving time and energy, cost, ease of cleaning, safety, warranty and guarantee.

**UNIT II**

Definition of Equipment. Classification of equipment: Major/ minor, Electrical/Non electrical, motorized / electronics, low voltage appliances, heating appliances and white and brown goods, Base materials used in household equipment. Its types, classification, merits and demerits, Finishing materials: types, process of application, merits and demerits, Insulation materials — types, form, usage merits and demerits, Washing and placing kitchen utensils in respective places, Trends in household equipment available in the market

**UNIT III**

Equipments used for preparation : mixer and grinder, food processor, egg beater, coffee maker, blender, Cooking: induction stove, gas stove and microwave oven, Cleaning: vacuum cleaner, electric chimney, dishwasher, Heating : Geyser, immersion water heater, iron box, Storage: Refrigerator , Comforts: Air conditioner, air cooler, Minor Equipment: toaster, roti maker. Role of embedded systems in household equipment design and functional compatability.

Factors affecting selection and use of equipment in the home.

**UNIT IV**

Laundering and Cleaning Equipment – Washing Machines – Parts, types, principle, use and care. Iron – Types, use and care. Floor care equipment – Vacuum cleaner, types, selection, use, care and maintenance. Climate control equipment – Air conditioner, Air purifier. Garden Tools and Equipment – Plough, Plank, Cultivator, Pruning knife, Pruning shear, Hedge shear, grass shear, spade, Garden rake, Garden Hoe, sprayer, watering can, Gloves and cutters.

**UNIT V**

Equipment using Renewable source of energy – Energy crisis, factors, Leading to energy conservation techniques, Application of alternate source of energy, Solar energy – merits and limitation – solar cooker, solar dryer, water heater, Wind energy – wind mills, types, principles, strength and limitation. Bio gas plant – Types, principles and strength and limitation.

**Text Book Reference:**

1. Senthi M. (2004). Institutional Food Management (2004). New Age International Publishers, NewDelhi.
2. Wilson P. (1996). Household Equipment and Management, Selection and Management, Houghton Miffin, London.
3. Shashi Bhushan Sinha, (2017). Handbook of Repair and maintenance of Domestic Electronics Appliances, BPB Publications.
4. Paul R. Wonning, (2016). Gardeners Guide to Gardening Tools. Print Edition.

# Khurmi R.S.and Gupta J.K (2006). Textbook of Refrigeration and Air-conditioning Chand Publications.

**E- Materials:**

1. <https://files.eric.ed.gov/fulltext/ED318920.pdf>
2. <http://navttc.org/wp-content/uploads/2019/07/Curriculum-for-EHA.pdf>
3. <https://www.voorburggroup.org/Documents/2013%20Tokyo/Papers/1006.pdf>
4. <http://ncert.nic.in/vocational/pdf/kegr104.pdf>
5. <https://www.slideshare.net/hongvu5855/washing-machine-54220492>

**Course outcome:**

After completion of the Course, the student will be able to

1. Identify factors influencing the choice of consumer durables.
2. Design base materials used in the construction of utensils and major equipment and finishes applied.
3. Manage small electrical appliances for food preparation.
4. Operate the major equipment with proper usage.
5. Apply the knowledge of using Renewable energy Equipments.

**PAPER - 9**

**BUILDING MATERIALS AND FINISHES**

**Course Objectives**

To enable the students to

1. Gain knowledge on concepts, types and use of building materials and selection tactics.
2. Learn use of materials at different levels or stages of a building construction and aesthetic concepts of using finishes in buildings.
3. Differentiate ideologies: traditional Vs recent building materials and their usage.

**UNIT I**

Building materials –Meaning, Concept of building materials, Classification of building materials. Components of a building – Sub structure and superstructure and use of specific building materials. Purpose and relevance of surface application on exteriors and interiors, its uses in various fields.

**UNIT II**

Materials used at various levels of building – foundation, basement, plinth, wall, roof, ceiling, flooring, beams and columns, etc., Use, types, characteristics, advantages and disadvantages of -brick, stone, sand, cement, wood, metals, glass and plastic.

**UNIT III**

Finishing materials. Wall finishes – plastering, white washing, paint, wood paneling, metal wall covers, tiles - use, selection, merits and demerits. Wall paper - kinds of wall paper, selection of wall paper, advantages and disadvantages of wall paper, care and maintenance.

Floor finishes –Hard finishes - cement, mosaic, marble, tiles, wood. Resilient materials - asphalt tiles, vinyl, cork, rubber, asbestos, linoleum - use, selection, merits and demerits.

**UNIT IV**

Ceilings - Treatment of ceilings - False Ceiling: plaster of paris, metal, glass, wood, acoustical ceiling materials, light ceiling – thermocol; use, selection, merits and demerits. Other innovative materials. Roof – wood, metal, slate, tile, asphalt shingles, glass fibre shingles.

**UNIT V**

Recent advances in building materials and finishes. Construction materials, interior finishes and exterior finishes, partition materials. Approximate cost of building materials and finishes. Concept of green building materials. Physical and behavioural properties, application in the construction of floors, walls, ceilings, doors, windows, staircase, built in furniture, partitions and other interior design components.

**Text Book References:**

1. Arora, S.P and Binddra, S.P., (2013) A Text book of building Construction. New Delhi: DhanpatRaiPublications,India.
2. Rangwala, S.C., (2008). Engineering Materials. Gujarat: Charotar Publishing House,India.
3. Rangwala, S.C, (2009). Building Construction. Gujarat: Charotar Publishing House,India.
4. Francis D.Ching, Design Drawing, Wiley publishers · John.F.Pile, Interior Design, 2nd edition, illustrated.
5. H.N.Abrams, 1995. · Maureen Mitton, Interior Design Visual Presentation: A Guide to graphics, models and presentation techniques, 3rd edition, wiley publishers, 2007.
6. Francis D.Ching, Design Drawing, Wiley publishers

**References:**

1. Stewart and Walton, S (2000). Paint Recipes for surfaces. New York: Anness Publishing Ltd., London.
2. Verma, B.P., (2003).Civil Engineering Drawing. Drawing and House Planning; New Delhi : Khanna Publishers,India.
3. Projects and Repairs using Concrete, Brick, Block and Stone (2000). Creative Publishing International.
4. John.F.Pile, Interior Design, 2nd edition, illustrated, H.N.Abrams, 1995.
5. Maureen Mitton, Interior Design Visual Presentation: A Guide to graphics, models and presentation techniques, 3rd edition, wiley publishers, 2007

**E – Materials:**

1. http://www.ca.uky.edu/agc/pubs/fcs4/fcs4402/fcs4402.pdf ·
2. http://en.wikipedia.org/wiki/Flooring ·
3. http://www.ehow.com/list\_7595438\_types-floors-floor-coverings.html ·
4. <http://www.diyadvice.com/diy/painting/interior/>

**Course outcome:**

Aftercompletion of the Course, the students will be able to

1. Identify and select proper construction materials and finishes for building construction.
2. Demonstrate knowledge of properties of various building materials.
3. Describe usage and characteristics of building materials and finishes for strength, durability and aesthetics.
4. Explain the components of a building and analyse the availability of materials for building construction.
5. Interpret construction materials Vs finishes and interior Vs exterior materials.

**PAPER - 10**

**BASICS OF** **ARCHITECTURE**

**Course Objectives**

To enable the students to

1. Understand the scope and development of architecture
2. Identify architectural features of period styles
3. Comprehend the elements and components of architecture

**UNIT I**

Development of architecture (Prehistoric) - Definition and conceptual meaning, Prehistoric Architecture – Mesolithic, Neolithic through Mesopotamia and Egypt – An overview

General influences on architecture, Elementary forms of construction, architectural elements – free forms, toroids, domes, coves, vaults, space frames

Classification of permanent architecture: based on structure - in antis and prostyle; based on use – domestic, religious and secular with examples

Supporting elements: classical orders, pillars, piers, cofferdams, cantilever, pendentives and squinches

Supported elements: architrave, entablature, roofing types, ceilings, domes, vaults, truss

Innovativeness or functional forms of structural systems: flying buttress, scaffolding and centering, lintels, pyramids, aqueducts, vaults and domes

**UNIT II**

Overview of architecture **-** Precedents in architecture, their historic contributions and salient features – an overview of masterpieces in Egypt, Greek- Acropolis, Propylaea, Parthenon, Agora and Erechtheum, Roman-Forum of Trajan, Colosseum, Baths of Trajan, Pantheon, Aqueducts and Apartment houses, Gothic-Chartres Cathedral, Indian, Buddhist and Islamic. Concepts of Organic architecture

Components of building; Methods of construction – Framed Vs Load bearing walls. Levels of construction.

**UNIT II**

Indian Architecture - Indus valley civilization – Harappa and Mohenjodaro;

Religious architecture – First rock cut and stone built temples

Buddhist architecture

Pallavas contribution – Mahabalipuram – five Rathas and stone templ; Kailasanatha temple and Caves of Ellora.

Midieval temples; Brahadiswara temple – Thanjavur

**UNIT III**

The towers of Bhuvaneswar- Lingaraja temple, Sun temple at Konark,

Khajuraho-Kandariya,Mahadeva temple; New architecture

Use of sandstone by Hoysalas, Temples of Deccan-Belur and Halebid;

Vijayanagara period, Srirangam temple, Madurai - Understanding the importance of Kudu, Kutas, Salas and Bodigaye

Secular architecture – Bahai temples, Lotus temple, Domestic architecture – Islamic contributions in India – Master pieces – tombs, mosque, domestic buildings, Tajmahal.

**UNIT IV**

Modern trends in architecture **-** Interactive architecture: concept, meaning, and examples

Responsive architecture: concept, meaning, and examples: Blur building

Kinetic architecture: concept, meaning, and examples: Millennium stadium, Burke Brise soleil, revolving house, sliding house, Arup’s bridge, Pamban bridge, tower bridge (London).

**UNIT V**

Modernism and future trends in architecture - Influence of corporate culture and multi nationalism – malls, new ways of entertainment

Future trends in architecture – influence of technology, materials (eco friendly and technical textiles), methods, personal environments, creating tangible and virtual products, 3D printing

Building automation – trends and acceptance by consumers.

**References:**

1. Asher, F.M. 2003, Art in India – Prehistory to the Present, Encyclopaedia Britannica, Inc.
2. Michell, G. 2000, Architecture and Art of Southern India. In: The New Cambridge History of India, Replika Press Pvt. Ltd., Delhi.
3. Parikh, A., Robertson, D., Lane,T., Hilliard, E. and Paine, M. 2000, The Ultimate Home Design Source book, Conran Octopus ltd., London.
4. Sharma, G. and Khanna, G, Advance Interior Designing incorporating Vastu and Feng-shui, India Publishers, Delhi.

**E – Materials:**

1. <https://azulevgrupo.com/en/blog/architecture-trends-2019-2020>
2. <https://en.m.wikipedia.org/wiki/Architecture_of_India>
3. <https://medium.com/studiotmd/emerging-trends-that-will-shape-the-future-of-architecture-356ba3e7f910>

**Course outcome:**

After completion of the Course, the students will be able to

1. Locate the influence of man’s desire for comfort and convenience over and above functionality.
2. Learn the features of temple architecture of India.
3. Understand trends created in capitalizing the advancements in science and technology in use of materials and methods used for construction.
4. Visualize futuristic concepts in the field of architecture and building construction.
5. Envisage challenges for modern day architects and civil engineers.

**CORE PRACTICAL - 3**

**3ds max IN INTERIORS**

**Course Objectives**

To enable the students to

1. To expose the students to 3ds max software.
2. To introduce 2D modifier for generating objects.
3. To apply materials for realistic texture to the objects.
4. To illuminate the scenes in the project.
5. To set viewports to display the camera’s point of view.

**UNIT – I**

**Introduction to 3ds max:**  Understanding the 3d max interface elements - Navigate the 3DS Max User Interface and Workspace,Command Panel, Time Slider and Track Bar, File Management. Customizing View port, navigation and configuration, Object creation, defining object, name and colour, transforms (move, rotate and scale with short-cut keys) and all the tools. **Exercise -** To comprehend the use of 3ds max interface.

**UNIT – II**

2D Modifiers - edit spline modifier, lathe, extrude, bevel, bevel profile, sweep, and fillet/chamfer, normalize spline, compound objects- Boolean, AEC extended objects – foliage, railing, wall, staircase, doors and windows. Copying objects- clone, instance, reference, array, space tool, normal align, align view and align camera, working with shape Boolean, edit - spline, compound object - loft, deforming loft objects - scale, twist, teeter, bevel, fit - modifying objects. Sub object selections, extrude, bevel, inset and connect modelling using loftmulti/sub object materials. **Exercise -** Generate different views of the plan used in design studio.

**UNIT – III**

**Introduction to the Materials:** Principles of materials and surfaces, Introduction to material editor interface, Tools in Material editor, different types of material – compact and slate material editor,Physical, Compound, Matte/Shadow, Ink and paint, Morpher material, Shell material for texture baking, XRef material.

**Exercise -** Using 2D maps, Introduction to UVW a mapping. Editing UVW map coordinates,

**UNIT – IV**

**Introduction to Lighting:** Interior Lighting, Three-Point Lighting, 3DS Max Lights, Lighting the Still Life in the Interior Space, Selecting a Shadow Type, Atmospheres and Effects, Light Lister.

Standard lights - Omni target spot and free spot target direct, free direct, sky light, place highlight photometric light - target point, free point, target linear, free linear, target area, free area. **Exercise -** Apply appropriate lighting to the project generated

**UNIT – V**

**Cameras and Rendering:** Creating Camera Object & a Camera View - Camera Viewport Controls & Setting Camera Parameters, Physical cameras, Target and free cameras parameters.

**Rendering**: Output image sizes, exports as jpeg, file handling- save, save as, save copy as, save selected, archive, summary info, view image file, hold, fetch, and undo/redo. Render scenes dialog, Scene states and batch render. **Exercise -** Create different views through camera positioning, Render the project with animation and save the file.

**Submission of record**

**References:**

1. Hussain S.K, T.B of water supply and sanitary engineering, 3rd ed, Oxford and IBH pub. Ltd., New Delhi, 1994
2. Kshirsagar, S. R, Water supply engineering, 6th ed, Roorkee publications, 1980.
3. Rangwala, S.C. water supply and Sanitary Engineering: Environmental Engineering, 19th ed, Charotar pub house, Anand, 2004.
4. Electrical wiring and contracting (vol. 1 to vol.4), London.The New era publishing Company.
5. Dr Frith Abnwos and others, Electrical Engineering hand book.
6. William. J. Guinness, Mechanical and Electrical Systems for Buildings, New York: McGraw Hill.
7. Faber, Oscar and Kell, J.R. Heating and Air conditioning of Building.Architectural Press, surrey, 1945.
8. Prasad Manohar, Refrigeration and air-conditioning. 5th ed, New Age Intl. pub, New Delhi, 1996. 53
9. Derek Clements-Croome, Derek J. Croome, Intelligent buildings: Design, Management and Operation, Thomas Telford Books, London, 2004.
10. Albert Ting-pat So, WaiLok Chan, Intelligent Building Systems, Kluwer Academic Publishers, 1999.

**E – Materials:**

1. <https://www.youtube.com/watch?v=2d0qODBRAVA>
2. <https://www.youtube.com/watch?v=933LIbNhcWM>
3. <https://3dtotal.com/tutorials/t/know-the-basics-3ds-max-part-3-material-editor-paul-hatton-tutorial-basics>.

**Course Outcome:**

After completion of the Course, the students will be able to

1. Become familiar with the 3ds max window interface.
2. Generate objects/ interiors with precise measurements.
3. Produce realistic texture to any given surface.
4. Enhance the clarity and three-dimensionality of a scene.
5. Create stimulation of still images and animation of the finished project.

**CORE ELECTIVE**

**PAPER - 3**

**(to choose one out of 3)**

**A. EVENT MANAGEMENT**

**Course Objectives**

To enable the students to

1. Understand the importance of Event Management.

2. Acquire knowledge in recent event concept and designing.

3. Learn principles and protocols of Event Management.

**UNIT I**

Principles of Event Management **-** Historical Perspective, Introduction to event Management, Size and type of event, Event Team, Code of ethics, Principles of event Management, concept and designing, Analysis of concept, Logistics of concept, Feasibility, Keys to success, SWOT Analysis.

**UNIT II**

Event Planning and Team Management **-** Aim of event, Develop a mission, Establish Objectives, Preparing event proposal, Use of planning tools, Protocols, Dress codes, staging, staffing, Leadership, Traits and characteristics.

**UNIT III**

Event Logistics, Production and Sponsorship **-** Logistic policy, procedures, performance standards, functional areas, motivation and leadership of logistics. Concept, theme, Fabrication, light and sound, handling vendors, proposal, event flow, team delegation, Sponsorship principles, terms and condition, branding and coordination.

**UNIT IV**

Event Concept and Designing **-** Developing the concept, analysis of concept, Types and categories, Designing the event , logistics of concept, case studies.

**UNIT V**

Event management as an enterprise - objectives and types**,** Planning and arrangement of various functions-award ceremonies, product launch, theme parties, wedding and institutional events, Indentifying resources for conduct of events and their proper use, estimating resource requirements. Event at commercial centres - trade fairs, exhibitions expositions and festivals.

**References**:

1. Walters, Raj & Rashid, (2009) Event management, an integrated & practical approach, SAGE publication.
2. Chaturvedi,(2009) Event management, a professional and development approach,Global India publication.
3. LynnVanDerWagen&BrendaRCarlos (2005), Event Management, Pearson.
4. AntonShone&BrynParry, (2010) Successful Event Management, Cengage Learning EMEA publications.

**E - Materials:**

1. http://brandhights.com/event-management/
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3. https://www.slideshare.net/mobile/123rokea/principles-of-event-management
4. https://institute-of-event-management.com/what-is-event-planning
5. https://www.visitmonmouthshire.com/events-management/concept.aspx
6. https://www.eventplanner.net/news/9382\_how-to-design-a-creative-event-concept.html
7. https://www.slideshare.net/mobile/johnpadua/events-management-chapter-2-event-concepts.

**Course outcome:**

After completion of the Course, the students will be able to

1. Understand the principles of event management.
2. Learn to prepare event proposal.
3. Know about event logistics and sponsorship.
4. Learn to enhance the skill in designing event.
5. Identify the types of events and use of resources.

**CORE ELECTIVE**

**PAPER - 3**

**B. INTERIOR ENVIRONMENT AND SERVICES**

**Course Objectives**

To enable the students to

1. Understand the basic principles of drainage and water supply in buildings.

2. Learn calculations and connections for water supply and sanitation.

3. Identify the need for fire protection equipments in buildings.

4. Understand the importance of conveyance systems.

**UNIT I**

Interior environment – meaning. . Environment control–importance of environment control, advantages, Elements to be controlled in the interiors – Temperature, Humidity and moisture, Wind, air movement and quality,

Day lighting and illumination – daylight factor, recommended daylight factors for interiors, importance of natural and artificial lighting in interior; Use of eco lighting.

Sound and Acoustics, sanitation, movement and accessibility

**UNIT II**

HVAC – Meaning , Heating–Need for room heating, types of heating systems –central, radiant, forced air; Active solar system and passive solar systems.

Ventilation–Definition, importance, Types of ventilation –Natural and mechanical, Guidelines for natural ventilation, types of natural ventilation and its application, Calculation of openings for natural ventilation and its benefits. Mechanical ventilation - ventilation with fans, ventilation with ducts, recommended fresh air supply.

**UNIT III**

Air conditioning – Meaning, Atmospheric conditions for human comfort, Principles of air conditioning, Need for air conditioning, Air conditioning applications, Humidity control, Duct table system along with its types and application, , process of air conditioning, types of air conditioning system and window units, packaged air conditioner, vertical air cooled packaged unit, horizontal package unit, central plant systems, ducts grills and diffusers

**UNIT IV**

Water supply systems – Introduction to water supply, types of water supply systems, calculation of water supply requirements and storage of water. Quality and distribution of water supply in multi storey building – application and its benefits, hot water supply and retaining rain water.

Sanitation, - types of sanitation, introduction to drainage system, types of drainage system, traps - different types used. Septic tank, two types of plumbing systems - ventilation systems, inspection chambers/manholes.

**UNIT V**

Fire protection,-causes of fire and preventive measures. Fire resistant construction, responsibility of designer towards fire resistance specification and requirements.

Access and movement systems - Elevators and escalators - Types and applications, Estimating the load, and size requirements, special and custom elevators - domestic elevators, chair lifts. Ramps and accessibility, Recommended ramp slopes for accessibility in interiors

**References:**

1. Pratap R.M (1988) Interior design principles and practice, Standard publishers distribution, Delhi,

2. Corky Binggeli, Building Systems for Interior Designers, Wiley; 2 edition (2009)

3. Lisa M. Tucker, Sustainable Building Systems and Construction for Designers, Fairchild Books; 2 edition (2014)

4. Faulkner, S., and Faulkner. R, (1987), Inside Today‟s Home, Rinehart publishing company, New York

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8. Purnima, B.C., ‘Environmental Engineering-I-Water Supply Engineering”, Laxmi Publications (P) Ltd, New Delhi, 2005

9. Rangwala, S.C., “Water Supply and Sanitary Engineering”, Charotar Publishing House, Gujarat, 1988

10. Singh, Gurcharan, “Water Supply and Sanitation Engineering (Environmental Engineering)”, Standard Publishers Distributors, 2007

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1. <https://medium.com/@ECONYL/5-principles-of-sustainable-interior-design-b390503a5176>
2. <https://www.sepco-solarlighting.com/blog/bid/145611/the-advantages-of-led-lights-for-the-environment>
3. <https://maintenx.com/natural-light-vs-artificial-light-pros-cons/>
4. <https://www.thespruce.com/types-of-home-heating-systems-1824772>
5. <https://en.wikipedia.org/wiki/Fire_safety>
6. <https://www.elevators.com/types-elevators-used/>
7. <https://en.wikipedia.org/wiki/Air_conditioning>
8. <https://gharpedia.com/blog/different-types-traps/>

**Course outcome:** After completion of the Course, the student will be able to

1. Understand the importance of human comfort and environment control.
2. Analyse the role of heating and ventilation in interiors.
3. Examine the types and uses of air conditioning.
4. Understand the different types of plumbing systems in buildings.
5. Learn the fire protection and access systems in buildings.

**CORE ELECTIVE**

**PAPER - 3**

**C. ORGANIZATIONAL BEHAVIOUR**

**Course Objectives**

To enable the students to

1. Learn Organizational psychology and personality of people working in a firm.

2. Understand about belief, values and human motivation, idea generation for problem solving and innovation.

3. Understand job satisfaction measurement, nourishing employee talent, scope and expansion in a job.

4. Know the importance of group, conflict identification and resolution.

**UNIT I**

Organizational Behaviour – Definition, Scope and Application in Management. Organizational structure and design: strategy and goals of organizations; basic attributes of organizations, organizing and co-coordinating work, - different types of organizational design based on nature of business. Forces reshaping organization, Life cycles in organization.

**UNIT II**

Personality - Meaning - Determinants of Personality - Biological factors - Cultural factors - Family and Social Factors - Situational factors -Personality attributes influencing organizational behaviour, Interactive Behaviour and Interpersonal Conflict.

Perception - Meaning - Need - Perceptual Process – Perceptual Mechanism - Factors influencing perception.

Attitude - Meaning of Attitude - Characteristics of Attitude – Components of Attitude - Attitude and Behaviour – Attitude formation, change in attitude and barriers to attitude.

Motivation - Financial and non-financial motivation - techniques of motivation - Transactional Analysis - Brain storming.

**UNIT III**

Group dynamics and teamwork - Meaning, types of groups in organizations, stages of group, foundations of group performance, decision making in groups.

Teams and teamwork, team building, improving team processes, teams in the high performance workplace.

**UNIT IV**

Leadership – Types, theories and practice - trait, behavioral, Fiedler’s contingency theories. Transformational leadership. Power and politics: power and influence, power - formal authority and obedience empowerment, organizational politics – political behavior in organization.

Counseling - meaning - Importance of counselor - types of counseling - merits of counseling..

**UNIT V**

Organizational culture - understanding organizational cultures, managing organizational culture.

Organizational Change: Meaning - Nature of work change - Pressure for change - Change process - Types of change – Factors influencing change - Resistance to change - Overcoming resistance.

Organizational Development –Meaning and different types of organizational development interventions.

**Text Book:**

L.M. Prasad – Organisational Behaviour

**References:**

1. Stephen P. Robbins, Timothy A. Judge, NeharikaVohra - Organizational Behavior 14th Edition, Pearson 2011

2. Kavita Singh - Organizational Behavior: Text and cases, Pearson, 2010

3.K. Aswathappa, Organizational Behaviour, HPH.

4. Appanniah, Management and Behavioural Process, HPH.

5. Rekha and Vibha – Organizational Behavioural, VBH. 20

6. Robbins, Organizational Behaviour, International Book House.

7. John W. Newstrom and Kieth Davis, Organizational Behaviour, McGraw Hill.

8. M. Gangadhar. V.S.P.Rao and P.S.Narayan, Organizational Behaviour

9. M.N.Mishra: Organisational Behaviour and Corporate Development, HPH.

10. Karamapl : Business Management and Organizational Behavioral I.K. International

11. N.S. Gupta, Organizational Behaviour, HPH.

12. Sharma R.K and Gupta S.K, Management and Behaviour Process, Kalyani Publishers.

**E – Materials:**

1. <https://en.wikipedia.org/wiki/Organizational_life_cycle>
2. <https://www.tuturself.com/posts/view?menuId=136&postId=1027>
3. <https://www.achievers.com/blog/organizational-culture-definition/>
4. <https://www.economicsdiscussion.net/organisation/what-is-organisational-change/31897>
5. <https://www.indeed.com/career-advice/career-development/leadership-styles-and-theories>
6. <https://www.tlu.ee/~sirvir/Leadership/Leadership%20Models/contingency_theory.html>
7. <https://www.managementstudyhq.com/types-of-groups.html>
8. <https://www.yourarticlelibrary.com/personality/personality-meaning-and-determinants-of-personality/24336>
9. <https://www.iedunote.com/perception>

**Course outcome:**

After completion of the Course, the students will be able to

1. Analyze the individual and group behavior; and understand the implications of organizational behaviour on the process of management.
2. Identify various theories of motivation from the past the and evaluate motivational strategies used in a variety of organizational settings.
3. Enhance productivity of the organization by ensuring required job satisfaction and employee attitude.
4. Understand the supervisory effects on performance and to train supervisors by understanding different supervision styles.
5. Evaluate the appropriateness of various leadership styles and counseling methods.

**OPEN ELECTIVE**

**PAPER - 3**

**(to choose one out of 3)**

**A. ACCESSORIES IN INTERIORS**

**Course Objectives**

To enable the students to

1. Apply, create and study the functional and decorative values of accessories in interiors.
2. Arrange flowers with basic principles and take care of the accessories.
3. Gain knowledge on different arts and craft items and their use in interiors.

**UNIT I**

Accessories - Definition and importance in interiors, Classification – functional, decorative and both accessories. Factors influencing the selection of accessories, Placement, location and background for accessories.

**UNIT II**

Kinds of accessories - Decorative - mural, photographs, pictures, artifacts, drawings, antiques. Functional accessories - books, mirror, clock, accent furniture.

**UNIT III**

Indoor plants – Need and importance of indoor plants, selection of placement of indoor plants. Care and maintenance.

Sculpture – types, uses in interior and exterior.

**UNIT IV**

Flower arrangement – Role of flower arrangement as accessories. Types of flower arrangements – line, mass, line and mass, miniature, floating, foliage and dry arrangements, Japanese styles of arrangements, Basic principles and Color application.

**UNIT V**

Art and Crafts – definition, kinds of art and crafts-pot painting, glass painting, wall art, wall hanging, pillows, cushions, origami, models, lamps and vases, bamboo crafts, folk arts and crafts of India, Application of arts and crafts in interiors.

**Text Book Reference:**

Premavathy Seetharaman and Parveen Banu, (2001). Interior Design and Decoration.CBS publishers.

1. Andal. A and Parimalam.P, (2008). A Text Book of Interior Decoration. Satish Serial Publishing House.

**References:**

1. Anna Hong Rutt (Second edition, 1991). Home Furnishing. John Wiley & Sons, Inc.
2. Martha Vaughan & Phoebe Vaughan, (1993). Simply The Best Home Decorating Book, Fashion Apparel, Accessories & Home Furnishings. Jay Diamond & Ellen Diamond, Pearson Education, Inc.
3. Book Club Associates, (1990). Good House Keeping’s Home Encyclopedia.
4. Eaglemoss Publications Ltd, (1996). Creating your Home, Creative Flowers & Plants for Your Home.
5. Eve Harlow, (1995). The Book of Handicrafts for all the Family. Hennerwood Publishing Limited.
6. The Practical Encyclopaedia of Good Decorating and Home Improvement, Vol I.
7. Creative Home Owner, (First Edition 2006). Design Ideas of Home Decorating. New Jersey.

**E- Materials:**

1. <http://www.home-designing.com/category/accessories>
2. <https://wbdg.org/ccb/AF/AFDG/interior.pdf>
3. <https://en.wikipedia.org/wiki/Sculpture>
4. <https://origami.me/paper/>
5. <https://hmhub.me/indoor-plants-selection-care/>
6. <https://www.bookmyflowers.com/blog/7-different-types-of-flower-arrangements-for-various-occasions/>
7. <https://www.dgreetings.com/fragrance-flowers/type-of-flower-arrangement.html>

**Course outcome:**

After completion of the Course, the students will be able to

1. Classify accessories and analyze the importance, selection and arrangement of accessories in relation to background.
2. Criticize various kinds of art forms used as accessories.
3. Arrange flowers with principles.
4. Take care of accessories with proper maintenance.
5. Appraise the folk art styles in interiors.

**OPEN ELECTIVE**

**PAPER - 3**

**B. COMMERCIAL INTERIORS**

**Course Objectives**

To enable the students to

1. Learn the importance of Merchandizing.
2. Distinguish display techniques.
3. Study psychology of window display.
4. Acquire knowledge on retail space.

**UNIT I**

Commercial Art - Meaning and definition of commercial art and its importance in Merchandising. Development of commercial art. New trends, Steps in Merchandising and art display. Role of commercial art in Merchandising**.**

**UNIT II**

Commercial display and Techniques – Interior Display – general Arrangement, principles and factors, types and merchandise display, types of lighting arrangements in commercial buildings.

**UNIT III**

Window Display **-**Meaning, basic principles, factors of window display, window arrangement-window art, psychology of window display, Techniques and importance. Types of window display- Closed, Open, Island, Elevated, Shadow box, Corner and Semi-Closed displays.

**UNIT IV**

Definition of commercial space, types of commercial space-Office Space, Retail space, Hospitality space, Health care, Education, Entertainment and Relaxation, Religious, Banks and Financial Institutions – their functions and need, Factors to be considered in Commercial space design, Recent trends in commercial space design.

**UNIT V**

Retail Space **-**Introduction to Retail space, Types of Retail Layout-Straight plans, Angular plans, Geometrical plans and Diagonal plans. Principles of Retail store design -Eye catching Visual Merchandising, Slowing the customer journey in the store, Customer pathway, Steering the customer to the right of the store, Creativity and Innovation, Aerating the store design, Optimize space. Elements of Store Design-Exterior, Interior, Atmosphere, Fixture, Merchandise, People.

**References:**

1. 1.Gupta, C.B., Dr. Nair, Rajan 2003, Marketing Management, Sultan Chand &Som, New Delhi.
2. Joseph, D.C., Julies, P. and Martiv, Z. 1992, Time Saver Standards for Interior Design and Space Planning, New York.
3. Nair, R. 2002, Marketing, Sultan Chand and Sons Publisher, New Delhi.
4. Pattanchetti, C.C. Reddy, P.N. 1995, Marketing, Rainbow publishers, Coimbatore.

**E Materials**:

1. <https://www.smartsheet.com/retail-merchandising>
2. <https://sinalite.com/printersuccess/visual-merchandising-7-steps-to-revitalize-your-print-shop/>
3. <https://www.digitalvidya.com/blog/display-advertising/>
4. <https://www.warehouse-lighting.com/blogs/lighting-application-suggestions/different-types-of-office-lighting>
5. <https://www.unibox.co.uk/news-inspiration/types-importance-of-window-displays>
6. <https://smallbusiness.chron.com/psychology-visual-merchandising-66054.html>
7. <https://timesofstartups.com/more/factors-consider-planning-office-design-layout/>
8. <https://accountlearning.com/selection-of-office-building-important-factors-to-be-considered/>

**Course outcome:**

After completion of the course the student will be able to

1. Recognize the role of art in merchandising.
2. Identify techniques of display.
3. Make various types of window display.
4. Design commercial space for various uses.
5. Create retail space for different requirements of customers.

**OPEN ELECTIVE**

**PAPER - 3**

**C. BASICS OF FURNITURE DESIGN**

**Course Objectives**

To enable the students to

1. Familiarize with the basic considerations in furniture design, aesthetics and appropriate structure.
2. Comprehend the socio- economic and cultural factors that influence the design of furniture.
3. Understand the role of fabric in interior decoration.
4. Develop ability to design fabulous window treatments

**UNIT I**

Furniture - Meaning and importance, Styles of furniture – traditional, contemporary and modern design. Classification- Furniture for comfort, rest and relaxation, work and storage, built-in and portable, Factors influencing furniture decisions – family needs, preferences, availability, principles of design and financial limit. Factors to be considered in furniture selection.

**UNIT II**

Materials used in furniture construction -Familiar furniture materials – Wood – teak, rose wood, walnut, cedar, mahogany, pine, birch, sal, ply wood, veneers bamboo, cane, metals, plastics, leathers, fabrics, glass.

**UNIT III**

Steps involved in furniture construction- Shaping, carving, turning, fluting, reeding and joining of furniture. Types of joints.

Upholstered furniture – meaning and method of construction.

**UNIT IV**

Selection and Arrangement of furniture - Factors to be considered in the selection of furniture, arrangement of furniture for various rooms – Living room, dining room, bedroom, kitchen and study room.

**UNIT V**

Care and maintenance of different types of furniture – wood, metals, plastic, and cane. Furniture polishes – types, natural and synthetic varnishes**,** other types of furniture finishes.

**References:**

1. [Gandotra V, Shukul M and Jaiswal](https://www.abebooks.com/servlet/SearchResults?an=Veena%2BGandotra%2BManeesha%2BShukul%2Band%2BNeerja%2BJaiswal&amp;cm_sp=det-_-bdp-_-author)N ,(2011). Introduction to Interior Design and Decoration, New Delhi: Dominant publishers,India.
2. [Premavathy .S](https://www.google.co.in/search?tbo=p&amp;tbm=bks&amp;q=inauthor%3A%22Premavathy%2BSeetharaman%22),(2005) Interior Design and Decoration, New Delhi: CBS Publishers and Distributors,India.
3. Stuart. L,(2013) Furniture Design: An Introduction to Development, Materialsand Manufacturing, Laurence King Publishing,London.
4. Stepat, D.D, (1971), Introduction to Home furnishings, The Mac Millan Co,NewYork.
5. Wilhide, E and Cope stick, I. (2000) contemporary decorating, conron octopus Ltd., London.
6. Levine M (1998), Living rooms, Rockport publishers,USA.
7. Faulkner. R and Faulkner. S, (1987), Inside today’s home, Rinehart Winston, New York.
8. Mullick.P, (2000), Textbook of Home science, Kalyani publishers, NewDelhi.

**E- Materials :**

1. <https://www.pinterest.com/freehandarch/living-room-references/>
2. <https://tympanus.net/codrops/2010/04/27/60-interior-design-and-furniture-websites-for-your-inspiration-2/>
3. <https://www.luxdeco.com/blogs/styleguide/popular-interior-design-styles>
4. <https://www.decoraid.com/blog/interior-design-history>
5. <https://www.dezeen.com/interiors/offices-interiors/>
6. <https://www.researchgate.net/figure/Materials-and-finishes-proposed-for-selected-furniture-design_tbl1_228933679>
7. <https://www.sciencedirect.com/science/article/pii/S0261306905002736>
8. <https://www.slideshare.net/Diwakarkushwaha5/types-of-materials-using-to-make-furnitures-interior-design-vi-sem-2017>
9. <https://www.idec.org/files/M_Anderson&J_Pengilly_2.pdf>
10. <https://mondecasa.com.sg/5-popular-materials-used-for-outdoor-furniture-manufacturing/>

**Course outcome:**

Aftercompletion of the Course, students will be able to

1. Identify and select furniture for different areas of a residence.
2. Analyse the furniture for the process involved, joineries used and finishes applied in furniture construction.
3. Differentiate or interpret the styles in furniture.
4. Analyse the trends in furniture usage.
5. Care and maintain furniture used in a given area.

**SEMESTER IV**

**PAPER - 11**

**PROFESSIONAL PRACTICE AND ESTIMATION**

**Course Objectives**

To enable the students to

1. Impart awareness on approach to work by designer**.**
2. Introduce to issues related with the interior designer’s profession.
3. Working out quantities of different materials and their costs to prepare an estimate of the project before execution.
4. Prepare of Estimation and Specification for executing projects.

**UNIT I**

Interior Designers approach to works:ways of getting works: types of works, works partly executed by other Interior Designers. Various precautions to be taken before taking up the work, conditions of engagement between interior Designer and client: commencement of work.

Preliminary knowledge of Consumer protection Act and other related acts as applicable to Interior Designers.

**UNIT II**

Issues of professional practice: Professional behaviour, Ethics, Types of clients, Contracts, Tenders, Arbitration as defined in terms of Interior Design field and current day context. Career opportunities, styles of interior design practice, relationship between client and professional, type of fees, process of fees negotiations, billing methods, tax liabilities, contracts – types of contracts – item rate, labour, lump sum, cost plus percentage, etc.,

**UNIT III**

Interior Designer’s duties: drawings to be prepared: Interior Designer’s relation with other parties connected with works such as client, contractor, sub-contractors, consultants and authorities. IIID Code of professional conduct: scale of charges: units and mode of measurements, clerk of work and his duties, inspection of work, certificate of payment to contractor, bill of quantities, schedule of rates, tenders, public, limited and negotiated tender documents and allied formalities.

**UNIT IV**

Rate Analysis and Estimation Format: Rate Analysis – definition, method of preparation, quantity and labour estimate for woodwork, steel work, aluminium work, glass and its rate for different thickness and sections, finishing (enamel paint, melamine, DU coats, Hand polishing, veneering and laminating) for walls and ceilings. Electrical and plumbing products, wiring, ducting, and laying of tiles and wall paneling in the estimate format of the project.

**UNIT V**

Estimation and Specification: Detailed Estimate – Estimating interior items manually and through spreadsheet programmes, abstract of Estimate, contingencies, labour charges, bill of quantities, different methods of estimate for interior design works, methods of measurement of works. Specification – Definition, purpose, procedure for writing specification for the purpose of calling tenders, types of specification. Specification for different item related to interior design project.

**References:**

1. S. C. Rangwala, Elements of Estimating and costing, Charoter publishing House, Anand, India, 1984.
2. The interior designers guide: to pricing, estimating budgeting. By Theo Susan
3. M. Chakrabarti. Estimation, Costing, Specification and Valuation in Civil Engineering.
4. Dutta, Estimating and Costing, S. Dutta and Co., Lucknow 1983
5. Carol Simpson, Estimating for Interior Designers, Watson Guptill, Rev. Sub edition,2001.
6. Indian Institute of Architects. H.B. Professional Practice, The Architects pub. Bombay.
7. Namavati. H. Roshan. Professional Practice. 8th ed, Lakshani Book Depot, Bombay, 2001.
8. Christine .M. Piotrowski, Professional practice for Interior Designers, 3rd edition, Wiley and sons, 2001.
9. Cindy Coleman,Interior Design Handbook practice, McGraw Hill professional, isted, 2001
10. Ronald Veitch, Professional practice for Interior Designers, Penguin Publishers, Limited, 1987.

**E – Materials:**

1. <https://collegegrad.com/careers/interior-designers>
2. <http://www.gautamshah.in/PDF/DMIJul07.pdf>
3. <http://osp.mans.edu.eg/elbeltagi/Cost%20Ch4.pdf>
4. <https://interiordesign.org.sg/code-of-professional-conduct>
5. <http://www.civilprojectsonline.com/civil-projects/purpose-of-specifications-and-types-of-specifications/>
6. <https://www.concreteconstruction.net/how-to/construction/spreadsheet-based-estimating_o>
7. <https://designlike.com/9-basic-styles-in-interior-design/>
8. <https://resources.workable.com/interior-designer-job-description>
9. <https://www.coa.gov.in/index1.php?lang=1&level=2&&sublinkid=295&lid=82>
10. <https://theconstructor.org/construction/analysis-of-rates-for-civil-engineering-works/6488/>

**Course outcome:**

After completion of the Course, the student will be able to

1. Know how to understand and conduct oneself as business person.
2. Update about client’s expectation and legal and ethical operation.
3. Gain knowledge on collaborating with industry cohorts and prepare quotation for works.
4. Estimate the cost of various works.
5. Generate bills of estimates.

**CORE ELECTIVE**

**PAPER - 4**

**(to choose one out of 3)**

**A. SUSTAINABLE INTERIORS**

**Course Objectives**

To enable the students to

1. Understand the importance of green building technology.
2. Learn the significance of using solar devices.
3. Acquired knowledge in recent green building materials and to trap rain water

**UNIT I**

Green building technology – Meaning, concept, need for developing green building concept in India, importance of green building technology, benefits of green buildings – environmental benefits, economic benefits, social benefits, Disadvantages of green buildings, impact of green building on human health and natural environment.

**UNIT II**

Sustainable building materials - Meaning, Characteristics of sustainable materials. Materials and finishes used in green building – Bamboo, straw bale, recycled plastic, wood, dimension stone, Recycled stone, non-toxic metals, Earth blocks-compressed, rammed and baked; flax linen, sisal, wood fibres, cork, coconut, non- VOC paints and polyurethane block. Vermiculites – meaning and commercial uses.

**UNIT III**

#### Green building practices and technologies. Site planning and design, Energy Efficiency – Passive Solar Design- advantages, use of thermostats, doors, windows and insulating materials, Materials Efficiency – recyclable materials, Operations and Maintenance Optimization, Water Efficiency - **Porous paving schemes**, landscaping and plumbing, Indoor Environmental Quality Enhancement - lighting, ventilation and low VOC paints, Waste Reduction.

**UNIT IV**

Renewable energy resources – meaning, importance of renewable energy resources.

Solar energy – advantages and disadvantages

Bio-Energy – biomass – meaning and importance of biomass resources.

Wind Energy - Environmental Benefits and Problems of Wind Energy

Tidal and Wave Energy –Environmental Aspects - Pros and Cons of Tidal and Wave Energy Geothermal Energy – Benefits, Challenges and Applications.

Future Prospects for Renewable Energy – Environmental Impacts of Energy Sources.

**UNIT V**

Water conservation technology – need for water conservation, Difference between water conservation and water efficiency, Strategies to save water at home, Rain water harvesting- meaning, importance of rain water harvesting, requirements of rain water harvesting structure, methods of rain water harvesting systems – surface run off and Roof top rain water harvesting, advantages, Grey water usage.

**References:**

1:Nilesh Y. J (2016), Green and Smart Buildings: Advanced Technology Options (Green Energy and Technology) , Springer; 1st ed.

2. Faulkner,S. and Faulkner,R.(1987), Inside Today’s Home, Rinehart Publishing Company, New York.

# 3. [Charles J. Kibert](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Charles+J.+Kibert%22), (2008), Sustainable Construction: Green Building Design and Delivery, John Wiley and sons.

# 4. Rai, G.D. (1995), Solar Energy Utilization, Khanna Publishers, New Delhi.

# 5. Rob Avis P and Michelle A.P.( 2018), Essential Rainwater Harvesting: A Guide to Home-Scale System Design  New Society Publishers.

# 6. Riggs, J.R. (1992) Materials and Components of Interior Design, Regents Hall, New Jersey.

# 7. Roa, M.P. (1998), Interior Design, Principles and Practice, Standard Publishers, Delhi.

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**E- Material:**

1. <https://theconstructor.org/building/elements-of-green-building/5375/>
2. https://theconstructor.org/water-resources/methods-of-rainwater-harvesting/5420/
3. <https://www.greenbuilt.org/about/importance-of-green-building/>
4. https://chillsairconditioning.com/how-does-solar-air-conditioning-work/
5. <https://en.wikipedia.org/wiki/Vermiculite>
6. https://en.wikipedia.org/wiki/Solar\_lamp
7. <https://homeguides.sfgate.com/importance-renewable-resources-energy-79690.html>
8. <https://en.wikipedia.org/wiki/Solar_air_heat>
9. <https://openei.org/wiki/Solar_space_heating>
10. https://home.howstuffworks.com/solar-air-heaters1.htm

**Course Outcome:**

After completion of the Course, the student will be able to

1. Understand green building concepts.
2. Learn the characteristics of green building materials.
3. Know the green building materials and practices.
4. Understand the importance of solar energy utilization.
5. Identify the methods of rain water harvesting.

**CORE ELECTIVE**

**PAPER - 4**

**B. ADVANCED RESOURCE MANAGEMENT**

**Course Objectives**

To enable students to

1. To understand the evolution of management in organizations.
2. To understand the various approaches to Management
3. Know the conceptual, human and specific aspects of management functions
4. Develop ability to evaluate the management efficiency and effectiveness in organizations

**UNIT I**

Introduction to Management:Concept of Management, Evolution of Management Thoughts; Managerial Functions – Planning, Organizing, controlling; Decision making – types and styles, Role of Manager, Application of Management in different fields and as a profession, Social responsibility and managerial ethics, Levels of management, Management skills, Management of innovation and Total Quality Management.

**UNIT II**

Management Function and Process:Planning – Objectives, Principles, policies, strategies, Controlling- Tools for management control, Evaluation –Tools and techniques, Appraisal., Decision Making - Meaning, Types of Decisions, Techniques and tools in Decision making- Decision tree and Cost benefit analysis.

**UNIT III**

Theories and Approaches to Management:The historical perspective, rationality of Bureaucracy, Classical approach problem with classical view point open and closed system. Behavioural approach, Systems approaches – by Henry Foyal, 14 principles of management and Scientific Management – principles, four parts of a system, the Contemporary perspective.

**UNIT IV**

Human Behaviours in Organisation:Personality, Attitude and Motivating Factors, Group behaviour and Dynamics, Team Management, Stress and Conflict Management in Organisations.

The conceptual model of organization behaviour; The individual processes – personality, values and attitude, perception, motivation, learning and reinforcement, work stress and stress management; The dynamics of organization behaviour – power and politics, conflict and negotiation, leadership process and styles, communication.

**UNIT V**

Techniques of Human Resource Management:PERT, GRANTT, CPM, and Total Quality Management.

HR challenges; HRM functions; The future challenges of HRM; Strategic Management of human resources; Human resource planning; Job analysis; Job evaluation; Recruitment and selection; Training and development; Promotion and transfer; Performance management; Compensation management and benefits; Employee morale and productivity.

**References:**

1. Harold Koontz, Heinz Weibrich (2006,) Essentials of Management,Tata Mc Graw Hills.
2. N.V.R Naidu, T.Krishna Rao (2008), Management and Entrepreneurship, IK International Publishing house pvt Ltd.
3. P.N.Reddy, P.C.Tripathi, H.R.Appannaiah, Essentials of Management, Himalaya publishing Home.
4. Shashi K. Guptha, and Rosy Joshi (2001), Organisational Behaivour, Kalyani Publishers, Ludhiana.
5. S.A Sherlekar (2005), Ethics in Management, Himalaya publishing house.
6. T.Sivalingam (2005), Foundations of Management, Vrinda Publications Ltd, Delhi.
7. Omvir Chaudhry Prakash Singh (2011), Principles of Management, New age International Publishers.

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1. <https://blog.easysourceindia.com/managerial-functions-in-hrm/>
2. <https://www.civilserviceindia.com/subject/Management/notes/the-dynamics-of-organization-behavior-communication.html>
3. <https://courses.lumenlearning.com/boundless-management/chapter/management-levels-and-types/>
4. <https://www.economicsdiscussion.net/management/tools-and-techniques-of-control-in-management/31537>
5. <https://www.usaeservice.com/2019/07/conceptual-model-of-organization.html>
6. <http://users.rcn.com/mm107/dt.html>
7. <https://www.businessmanagementideas.com/management/approaches-to-management>.
8. <https://www.managers.org.uk/~/media/Campus%20Resources/Henri%20Fayol%20%20Planning%20organisation%20command%20coordination%20and%20control.ashx>
9. <https://www.civilserviceindia.com/subject/Management/notes/the-future-challenges-of-HRM.html>

**Course outcome:**

After completion of the Course, the student will be able to

1. Understand the concepts and Management skills
2. Learn the management process.
3. Understand the theories and approaches to management.
4. Know how to manage stress and conflicts in organizations.
5. Identify the techniques of human resource management.

**CORE ELECTIVE**

**PAPER - 4**

**C. GREEN CONSUMERISM**

**Course Objectives**

To enable the students to:

1. Familiarize with the changing trends in Green Consumerism.

2. Enrich their knowledge and skills in identifying and using green products.

3. Aware of the necessity of implementing green consumerism.

**UNIT I**

Green Consumerism - Meaning and importance of green consumerism. green products, green marketing, green supply and green certificate; Need, consideration in daily consumption and significance

**UNIT II**

Roots of Green Consumerism: Environmental Problems Global climatic change; Destruction of rainforests, Ozone layer depletion Environmental pollution, Scope of green consumerism to reduce environmental impacts.

**UNIT III**

Lifestyle and Green Consumerism - Sustainable or eco-friendly lifestyle; Green/sustainable purchase behavior - meaning and benefits, efforts to reduce pollution and wastage in the production side.

**UNIT IV**

Implementation of Green Consumerism. Principles of green consumerism - reduction in packaging/plastic bags Eco-label certifications - green label/eco-label, green seal star rating; Eco Logo, EPA design for the environment.

**UNIT V**

Impacts of Green Consumerism, 3R Concept - Reduce, Reuse And Recycle Role of procurement in environmental management Freeganism, green marketing - biodegradable, environmentally friendly ,purchasing behaviour of consumers.

**References:**

1. Deshpande, J. Gangawane, L. V., Khilare, V. C. (2007), Sustainable Environmental Management, Daya Books.
2. Rangwala, S.C. (1999), Engineering Materials, Charotar Publishing House, India. Jeffery, Yvonne, Michael Grosvenor, and Liz Barclay (2008) Green Living for Dummies. Indianapolis, IN: Wiley Pub.
3. Snell, Clarke, and Tim Callahan (2005) Building Green: a Complete How-to Guide to Alternative Building Methods: Earth Plaster, Straw Bale, Cordwood, Cob, Living Roofs. New York: Lark.
4. Nayyar, J (2009) Green Living by Design: The Practical Guide for Eco-friendly Remodeling and decorating, China: Filipacci publishing.

**E – Materials:**

1. <https://www.conserve-energy-future.com/green-consumerism-importance-examples-strategies.php>
2. <https://www.kyos.com/faq/green-certificate/>
3. <https://www.thebalancesmb.com/green-marketing-2948347>
4. <https://www.moneycrashers.com/freegan-principles-problems-freeganism/>
5. <https://www.gdrc.org/sustbiz/green/doc-cons_introduction.html>
6. <https://hbr.org/2019/07/the-elusive-green-consumer>
7. <https://sites.google.com/site/richardgosden/green-consumerism>
8. <https://en.wikipedia.org/wiki/Green_consumption>
9. <https://en.wikipedia.org/wiki/Ecolabel>
10. <https://en.wikipedia.org/wiki/Green_Seal>

**Course outcome:**

After completion of the Course, the student will be able to

1. Acquire knowledge on importance of green consumerism.
2. Understand the roots of Green Consumerism.
3. Identify the impact of lifestyle on environment.
4. Learn the principles of green consumerism.
5. Know the significance of 3R Concept - Reduce, Reuse And Recycle in waste management.

**OPEN ELECTIVE**

**PAPER - 4**

**A. HOME FURNISHINGS**

**Course Objectives**

To enable students to:

1. Familiarize with the basic considerations in design, aesthetics and furnishings
2. Understand the role of fabric in interior design and decoration
3. Develop ability to design fabulous window, wall and door treatments

**UNIT I**

Introduction to home Furnishings- Definition, Importance of home furnishings, Need for home furnishings, use of furnishings – functional and decorative, Fabrics for protective clothing in interiors walls. Factors to be considered while selecting home furnishings.

**UNIT II**

Types of furnishings - Cushion, cushion covers, slip covers, bed linens, Table linens, kitchen linen, and bath linen.

Upholstery – History, types of upholstery – traditional, automobile, commercial, marine upholstery, care and maintenance

**UNIT III**

Types of fabrics used for furnishings **-** Chiffon, cotton, georgette, jersey, lace, leather, linen, polyester, satin, silk, velvet, viscose rayon. Uses and application in interior furniture- sofa, chairs, cushions, bed.

Carpets and rugs –Meaning, Importance, Difference between carpets and rugs.

**UNIT IV**

Window Treatment - Parts of window, Types of window treatments - Soft Window Treatment and Hard Window Treatment, Curtains – types of curtains, Blinds**-** Application, Fittings and Fixtures- French and vintage styles, Tie back, Hold back, Curtain Rods, Curtain rings and finials.

**UNIT V**

Care and Maintenance of home furnishing materials. Laundering - soaking, washing, rinsing, brightening or softening agents, drying, ironing and storing. Stain removal methods and agents, Principles followed while maintaining the fabrics. Storing and maintaining the soft furnishing.

**References:**

1. Mendelson,C., (2005). Home Comforts - The Art and Science of Home Comforts - The Art and Science of Keeping Home. Scriber Company. New York.
2. Stepat. D.D. (1991), Introduction to Home Furnishings, The Macmillan Company, New York.
3. Faulkner, R. and Faulkner, S. (1987), Inside Today’s Home, Rinehart Winston, New York.
4. Kasu, A. 2005, Interior design, Ashish Book Centre Mumbai
5. Veena, G., and Shukul M and Jaiswal N, Introduction to Interior Design and Decoration, Dominant publishers ansd Distributors, New Delhi
6. Seetharaman P, Pannu P (2009) Interior design and Decoration, New Delhi and distributors Pvt Ltd, New Delhi.

**E- Materials:**

1. http://www.britannica.com
2. <http://softfurnishingsforhome.weebly.com>
3. <https://en.wikipedia.org/wiki/Upholstery>
4. <https://www.thespruce.com/what-are-curtains-drapes-shades-and-blinds-4067656>
5. <https://www.homelane.com/blog/types-of-fabric-thats-best-for-your-home-interior/>
6. <https://www.99acres.com/articles/use-of-soft-furnishings-in-home-decor.html>
7. <https://textilecourse.blogspot.com/2018/06/types-classification-home-textiles.html>
8. <https://aces.nmsu.edu/pubs/_g/G402.pdf>

**Course outcome:**

After completion of the Course, the students will be able to

1. Understand the difference of furnishings used in various rooms.
2. Differentiate period styles in furnishings.
3. Appreciate role of soft furnishings in an interior.
4. Contemplate on furnishings’ selection based on use, comfort and cost.
5. Take care of different types of household textiles.

**OPEN ELECTIVE**

**PAPER - 4**

**B. GREEN INTERIORS**

**Course Objectives**

To enable the students to

1. Understand the importance of green building technology.

2. Acquire knowledge in recent green interior materials and to harvest rain water.

3. Learn the role of green HVAC technologies in energy conservation.

**UNIT I**

Green building technology – Meaning, concept, impact of green building on human health and natural environment, need, importance and benefits of green buildings.

**UNIT II**

Materials and finishes used in green buildings – Bamboo, straw, wood, dimension stone, Recycled stone, non-toxic metals, Earth blocks-compressed, rammed, baked; vermiculture, flax, linen, sisal, wood fibers, cork, coconut ,polyurethane block.

**UNIT III**

Green building practices and technologies. Roof, walls, floors – electrical, plumbing, windows, and doors, heating, ventilation and air conditioning (HVAC), insulation, Interior finishes, landscaping.

**UNIT IV**

Renewable energy resources. Solar Energy – meaning and importance, advantages, principles and functions of solar devices – solar room heater, solar lights, solar water heater, solar air conditioner.

**UNIT V**

Water conservation technologies Rain water harvesting-importance, requirements of rain water harvesting structure, types of rain water harvesting systems, advantages.

**References:**

1. Diesendorf, Mark (2007). Greenhouse Solutions with Sustainable Energy.
2. Faulkner, R., and Faulkner. S, (1987) Inside Today’s Home, Rinehart publishing House, New York
3. Rai G.D (1996), Solar Energy Utilization, Khanna Publihsers, Delhi.
4. Riggs, J.R. (1992) Materials and components of Interior Design, Regents Hall, New Jersey.
5. Roa, M.P. (1998), Interior design, principles and practice, standard publishers, Delhi
6. Chaudhari, S.N. 2006, Interior Design, Aavishkar Publishers, Jaipur, India.
7. Choudhury, A.K.R. 2000, Modern Concepts of Colour and Appearance, Oxford and IBH Pubhsning Co. Pvt. Ltd., New Delhi.
8. Hilliard, E. 2000, Brilliant Colour at Home, Kyle Cathie Ltd., London.
9. Laura Slack, What is product Design? Roto Vision Publishers, 2006.
10. Pile F 1997 Colour in Interior Design, Mc Graw hill, New York.
11. Reens Crochet and David Vleck, Designers’s Guide to Decorative Accessories, Prentice Hall, Ist Edition, 2008.
12. Wyszecki, G and Stiles, W.S. 2000, Colour Science - Concepts and Methods, Quantitative Data and Formulae, John Wiley and Sons Inc., New York.
13. Diesendorf, Mark (2007). Greenhouse Solutions with Sustainable Energy.
14. Faulkner, R., and Faulkner. S, (1987) Inside Today’s Home, Rinehart publishing House, New York

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1. <http://www.indiamart.com/handi-exports/flower-vessels-stands.html>
2. <http://www.theflowerexpert.com/content/growingflowers/flowers-and-seasons>
3. <http://www.talktalk.co.uk/home-garden/garden-advice/orchids-care.html>
4. <http://www.houzz.com/ideabooks/271411/list/5-Ways-to-Decorate-Around-a-Flat-Screen-TV>
5. <http://www.wvu.edu/~agexten/hortcult/flowers/preservi.htm>
6. <http://www.epa.gov/statelocalclimate/documents/pdf/12_8_what_is_green_GGGC.pdf>
7. <http://www.etn-presco.net/links/sustainable-building_technical-guide.pdf>
8. <http://greenliving.nationalgeographic.com/importance-renewable-resources-energy-2146.html>
9. <http://www.gdrc.org/uem/water/rainwater/rainwaterguide.pdf>

**Course outcome:**

After completion of the Course, the student will be able to

1. Understand the concept of green building technology.
2. Classify various materials and finishes used in green buildings.
3. Analyze the technologies used in Green building practices.
4. Judge the suitable Renewable energy source for interiors.
5. Design and create Awareness and execution of water conservation technologies in interiors.

**OPEN ELECTIVE**

**PAPER - 4**

**C. ALTERNATIVE SOURCES OF ENERGY**

**Course Objectives**

To enable the students to

1. Understand the Basic characteristics of energy, its transformation and sustainable process.

2. Overview on the utilization trends in energy conservation and efficiency.

3. Acquire intelligence in handling the conversion technologies and application of alternate sources of energy.

**UNIT I**

Energy – An Introduction: Meaning - Theory and Importance of Energy - Classification of Energy sources –Primary, Secondary and Intermediate – Conventional, Non-conventional – Renewable, Non-renewable – Commercial, Non-commercial, Origin – Energy for Sustainable Development - Energy Conversion–Energy Utilization Pattern in the Past, Present and Future Projections – Sector wise Energy Consumption – Environmental Aspects and Policies of Energy.

**UNIT II**

Alternate Sources of Energy: Energy Conservation and Efficiency – Need and Methods – Energy Efficiency and Need in Modern Buildings: Green Buildings – Intelligent Buildings – Energy Rating Buildings – Eco-housing Concepts – Energy Security - Alternate Sources of Energy – Use, Principles and Importance

Types of Alternative Sources of Energy – Solar – Biomass – Wind – Tidal and Wave Energy.

**UNIT III**

Solar Energy: An Introduction – Nature of Solar Radiation – Global – Beam and – Diffuse Radiation – Seasonal Variation of Solar Radiation - Measurements of Solar Radiation –Solar Collectors and Types – Solar Photovoltaic Systems - Solar Applications – Solar Water Heater - Solar Dryer – Solar Distillation (Still) – Solar Pumping Systems –Solar Air Conditioning and Refrigeration – Solar Cooker – Solar Green House.

**UNIT IV**

Bio-gas : Meaning and Importance of Biogas Technology – Principles of Biogas Conversion – Stages of Biogas Production – Types of Biogas Plants - Extraction of Energy from Wastes.

**UNIT V**

Wind Energy: Basics of Wind Energy – Measurement of Wind – Wind Energy Applications –Types of Wind Turbines – Applications of Wind Energy – Environmental Benefits and Problems of Wind Energy - Current Status and Future Prospects in India.

**Text Book Reference:**

1. Kothari, D.P. Singal K.C. & Rakesh Ranjan, (2011). Renewable Energy Sources and Emerging Technologies, 2nd Edition, PHI Learning Private Limited, India.

2. Bhatia, S.C & Gupta, R.K, (2018). Textbook of Renewable Energy, Woodhead Publishing India Pvt Ltd, India

3. Banerjee, B.P, (2005). Handbook of Energy and Environment in India, Oxford University Press, India.

4. Thiyagarajan, V, (2013). Renewable Energy Sources, Lakshmi Publications, India

5. Thipse, S.S, (2014). Non-Conventional and Renewable Energy Sources, Narosa Publishing House PVT Ltd, India

**References:**

1. Tiwari G.N., Solar Energy, Fundamentals design, modeling and Applications, Narosa Publishing House PVT Ltd, 2002, India.

2. Kishore V.V.N., Renewable Energy Engineering and Technologies, TERI, 2009, India.

3. Rai G.D., Non­-conventional Energy Sources, Khanna Publication, 2001, India.

4. Anne Maczulak., Renewable Energy: Sources and Methods, Library of Congress Cataloging-in-Publishing Data, 2010, New York.

5. Christopher AA. Simon., Alternative Energy – Political, Economic and Social Feasibility, Rowman & Littlefield Publishers Inc, 2007, USA

6. Kathiann M. Kowalski., Alternative Energy Sources, Marshall Cavendish Corporation, 2011, Malaysia.

7. Ziyad Salameh., Renewable Energy System Design, Elsevier Inc, 2014, UK

8. Aldo Vieira da Rosa., Fundamentals of Renewable Energy Processes, 2nd Edition, Elsevier Inc, 2009, UK

9. Vaughn Nelson., Introduction to Renewable Energy, Taylor and Francis Group, 2011, Florida.

10. Efstathios, E.M, (2012). Alternative Energy Sources, Springer, NewYork.

**E- Materials:**

1.https://books.google.co.in/books?id=pabWCwAAQBAJ&printsec=frontcover&dq=alternative+sources+of+energy&hl=en&sa=X&ved=0ahUKEwicy7rj-JfpAhXu6nMBHYYyC98Q6AEIYjAH#v=onepage&q=alternative%20sources%20of%20energy&f=false

2. https://shodhganga.inflibnet.ac.in/bitstream/10603/15703/8/08\_chapter%202.pdf

3. https://www.energy.gov/sites/prod/files/2017/03/f34/qtr-2015-chapter5.pdf

4. https://www.sciencedirect.com/science/article/pii/S1110016817300911

5. https://www.energy.gov/eere/solar/articles/solar-radiation-basics

6.https://www.researchgate.net/publication/331114519\_An\_Overview\_of\_Biogas\_Production\_Fundamentals\_Applications\_and\_Future\_Research

7. https://shodhganga.inflibnet.ac.in/bitstream/10603/87163/11/11\_chapter3.pdf

**Course outcome:**

After completion of the Course, the student will be able to

1. Define basic properties, classification and utilization pattern of alternate sources of energy.
2. Describe energy conservation, efficiency and energy aspects.
3. Analyze the new technological innovation and application of solar energy in daily living.
4. Understand the main elements of technical systems designed for utilizing alternate energy sources.
5. Acquire knowledge of other forms of energy sources, wave power, tidal power and geothermal principles and applications.

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