School of Planning and Architecture: Vijayawada

(An autonomous institution established by Ministry of Human Resource Development, Govt. of India)

MSAR111 - Design Studio (Simple Passive Strategies) |Lesson Plan

Objective:

To understand and analyze, climate and its elements at both micro and macro levels and Design The project with appropriate passive design strategies.

PART I – DESIGN OF RESIDENTIAL SCHOOL, VIJAYAWADA

Design of passive residential school in Vijayawada. Integrate passive strategies for the Design of classrooms and residential hostels. Students are expected to understand how building physics and climate work. Also, appropriate materials of construction should be used.

A. MAJOR REFERENCE BOOK READING: – 3 WEEKS*

1. Szokolay, S.V. (2014). Introduction to Architectural Science. The Basis of Sustainable Design. 3rd Edition. Routledge
2. National Building Code (NBC, 2016)
3. Energy Conservation and Building Code (ECBC-2018)
4.

B. UNDERSTANDING CONCEPTS/STRATEGIES/FAMILIARITY WITH BASIC SCIENCE AND PHYSICS OF BUILDINGS/TECHNIQUES – 2 WEEKS*

Literature reviews/desktop case studies/Standards/rules and regulations

1. Site Selection, Site Analysis and contextual evaluation of the identified site.
2. Framing of design problem and contextual analysis.
3. Explore the theories and concepts in the Design of simple passive strategies, particularly focusing on new concepts and techniques for achieving enhanced climate responsiveness and thermal as well as visual comfort for occupants, including striving for better indoor environment quality. (Students are expected to come up with their own requirements that would meet the proposed project's needs. They may use tools such as building bio-climatic chart analysis and other similar ways to come up with climate specific passive design strategies).
4. Identification of relevant case studies for understanding passive strategies.

5. Identify and incorporate the most appropriate and effective passive design solution for making residential school sustainable.
6. Design the School building based on the above principles.

C. ANALYSIS AND DESIGN INTERVENTION: (8 WEEKS)*:

Major Design:

Students are expected to develop a suitable architectural Design for a residential school by adopting simple passive strategies and also demonstrate the feasibility of such solutions qualitatively and quantitatively using manual or simple simulation tools. All the aspects of sustainable design strategies must be explored, starting from the site to the building design, passive strategies employed and building materials chosen to the final proposal.

Other References:

- Building Innovation, A Guide for High-Performance Energy Effcicient Buildings in India, Singh et al, Lawrence Berkley National Laboratory, 2018.
- Garg, V., Mathur, J., Tetali, S., Bhatia, A. (2017). Building Energy Simulation. Boca Raton: CRC Press.
- Jankovic, L. (2017). Designing Zero Carbon Buildings Using Dynamic Simulation Methods. London: Routledge.
- Szokolay, S.V. (2014). Introduction to Architectural Science. The Basis of Sustainable Design. 3rd Edition. Routledge
- National Building Code (NBC, 2016)
- Energy Conservation and Building Code (ECBC-2018)
- Day Lighting, architecture and Health-Building design Startegies, Mohamed Boubekri, Architectural Press, Elsevier.

*** Schedule of expected outcome shall be intimated from time to time.**

Course: **Design Studio I – Simple Passive Strategies**
Instructors: Dr. Janmejoy Gupta + VF
Contact Periods/week: 15 hours
Attendance: 75%
Minimum Passing Marks: 40%

Class: I Year (SEM I) M. Arch
Timetable:
Internal Assessment Marks: **60**
External Assessment (End Jury) **: 40**
Total Marks: 100

Weekly Plan

Weeks/Date	Nature of studio	Outcome
Week 1 17-08-2022	Introductory discussion – Sustainable House Design	Discussion
Week 2	Discussion on simple passive strategies and techniques - Sustainable House Design	**Student's presentation and discussion**
Week 3	Critically reading the book: Introduction to Architectural Sciences, NBC, ECBC and Research Papers	**Students presentation and discussion**
Week 4	Case Study Trip to (yet to be decided)	**Case Study Trip**
Week 5 Assessment I	Case Study Inferences and Site Finalization	**Students presentation and discussion**
Week 6	Site Inventory and mapping Understanding Concepts/Strategies/Familiarity With Basic Science And Physics Of Buildings/Techniques	**One to one discussion**
Week 7	● Site Inventory and mapping Understanding Concepts/Strategies/Familiarity With Basic Science And Physics Of Buildings/ ● Techniques-Initiation to Use of Building Bio Climatic Chart Based Analysis for helping select Appropriate Passive design strategies.	**One to one discussion**
Week 8	Discussion on individual design proposal and refined analysis results and calculations	**One to one discussion**
Week 9 Assessment II	Discussion on individual design proposal and refined analysis results and calculations	**One to one discussion**
Week 10	Dusshera Break (Students)	
Week 12	Architectural Passive Design Solution and Evaluation	**One to one discussion**
Week 13	Architectural Passive Design Solution and Evaluation	**One to one discussion**
Week 14	Architectural Passive Design Solution and Evaluation	**Students presentation and discussion**
Week 15 Assessment III	Overall review of works	**Students presentation and discussion**
Week 16 Assessment III 02-12-2023	Overall review of works	**Students presentation and discussion**

Faculty in-charge
(Janmejoy Gupta)

HOD Architecture

School of Planning and Architecture: Vijayawada
(An institution of National Importance under the Ministry of Human Resource Development, Govt. of India)
Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India

Department of Architecture

Course: **MSAR112 - Building Physics and Sustainability**
Instructors: Dr. Lilly Rose A

Contact Periods/ week: 03 periods.(55 min each)
Time Table: Monday 09:00am - 11:45pm
Attendance: Min 75%

Class: I M. Arch(SA), I Sem, A.Y. 2023-24
Internal Assessment: 50
External Theory Exam: 50
Total Marks: 100
Credits:3

Min. Passing Marks: 50% each in Internal & External Assessment and 50% overall

Objective: The aim of the course is to introduce climatic and building physics parameters to understand in depth the factors affecting comfort and strategies that lead to around/outside and inside the built space.

Out Line of the Course:

LECTURE PLAN

WEEK	DATE	TOPIC OF CLASS LECTURE & DISCUSSION	TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS
1	Week-1 21-08-2023	Earth-Sun relationship, Global Climate, Climatic zones in India, Analysis of macro & micro climate.	Lecture + Introduction to Sun path analysis using software
2	Week-2 28-08-2023	Interpretation of climatic data through Climate Data, Solar Path Charts, Psychrometric Charts, Bioclimatic charts.	Lecture + inclass activity
3	Week-3 04-09-2023	Thermal Comfort in Built environments and Thermal comfort indices, operative and comfort temperatures, Adaptive thermal comfort	Lecture + inclass activity
4	Week-4 11-09-2023	Importance of energy to human development, conventional and renewable energy sources – supply, uses and environmental impact. Assessment future growth in energy demand, availability, potential for sustainable development.	Lecture + Introduction to Assignment 1
5	Week-5 18-09-2023	Heat transfer processes in buildings. Thermal conductivity, emissivity, radiation, Reflectivity and convection.	Lecture + Numericals
6	Week-6 25-09-2023	Density, specific heat, latent heat, thermal bridging, diffusivity, thermal insulation, R-values and U-values	Lecture + introduction to Opaque 3.0 software for thermal analysis / Excercises
7	Week-7 02-10-2023	**Gandhi Jayanthi**	**Holiday**
8	Week-7 07-10-2023	**Mid Semsester week**	**Mid Semsester Examination**
9	Week-8 09-10-2023	Heat loss through common building elements. Calculation of principle building energy gains and	Lecture + inclass activity
10	Week-9 16-10-2023	Periodic heat flow through buildings, U-Value and its significance in building components in time lag and decrement factor. Estimation of building energy performance for heating and cooling for different climatic contexts.	Lecture + Inclass activity / Excercises
11	Week-10 23-10-2023	**Dusshera**	**Holiday**
12	Week-11 30-10-2023	Use of instruments like data loggers/ anemometer for thermal/ wind data recording	Climatology and Environmental lab
13	Week-12 06-11-2023	Field study, data collection and thermal comfort analysis.	Field study and analysis

14	Week-13 13-11-2023	Reduction Heat Transfer or Enhancement, insulation properties of materials and built forms. Radiation versus other Heat Transfer Methods.	Lecture + in class activity
15	Week-14 20-11-2023	Adaptive thermal comfort survey and analysis of results.	Assignment 2: Field study and analysis
16	Week-15 27-11-2023	**Guru Nanak's Birthday**	**Holiday**
17	Week-15 02-12-2023	Evaluating various built form and its components for thermal comfort conditions	Lecture + in class activity

S. No.	Stages of Evaluation	Weightage in %
1	Internal assessment (assignments, exercises, seminar etc.)	30
2	Mid-semester Examination	20
3	End Semester Examination	50
	Total	100

Reference Books:

1. Hugo S. L. Hens (2017)., 'Building Physics – Heat, Air and Moisture: Fundamentals and Engineering Methods with Examples and Exercises'., Wiley, Ernst & Sohn., Third Edition.
2. Martin Zeumer, Sebastian El Khouli, and Viola John (2015)., 'Sustainable Construction techniques., Detail Green Books., First Edition.
3. Mark DeKay (2011)., 'Integral Sustainable Design: Transformative Perspectives'., Earthscan., First Edition.
4. Andrew Scott (1998)., 'Dimensions of Sustainability'., E & FN SPON, Routledge.
5. K. Steemers and Nick Baker (2000)., 'Energy and Environment in Architecture: A Technical Design Guide'., Taylor & Francis.
6. David Thrope (2014)., 'Energy Management in Buildings: The Earthscan Expert Guide'., Routledge.
7. Marko Pinterić (2017)., 'Building Physics: From physical principles to international standards., Springer.
8. T.R.Oke (2002)., 'Building Layer Climates'., Second Edition, Routledge.

Course Instructor:
(Dr. Lilly Rose A)

Head of Department:
(Dr. Uma Sankar Basina)

Lecture Plan for Master of Architecture

1st Year 1st Semester

School of Planning and Architecture: Vijayawada
(An institution of National Importance under the Ministry of Human Resource Development, Govt. of India)
Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India

Department of Architecture - Landscape Architecture

Course: **Hydrology and Geomorphology**
Instructors: Kapil Natawadkar
Contact Periods/ week: 03 periods.(50 min each)
Time Table: Wednesday
Attendance: Min 75%

Class: I st Yr M. Arch(LA) I Sem A.Y. 2021-22
Internal Assessment: 50
External Theory Exam: 50
Total Marks: 100
Credits: 2
Min. Passing Marks: 50% each in Internal & External Assessment, 50% in Aggregate

Objective: To develop an understanding of the drainage pattern, watershed and usefulness of the hydrological principles in evolving a landscape design.

Out Line of the Course: Surface water flow, Runoff: hydrograph, runoff characteristics of streams, field, flow duration curve,Flew mass curve. Characteristics of Precipitation on India; relationship to vegetation, drainage basins, natural drainage patterns

LECTURE PLAN

WEEK	DATE	TOPIC OF CLASS LECTURE & DISCUSSION	TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS
1	Week-1	Introduction to Subject and overview. Hydrological Cycle; Evaporation, evapo-transpiration; and sources of surface water, forms of subsurface water, Occurrence and movement of ground water, geologic formations as aquifers, Infiltration, Soil moisture.	Lecture
2	Week-2	Precipitation, weather system's for precipitation, Rainfall regime with specific reference to the Indian region.	Lecture
3	Week-3	Characteristics and management of drainage basins: Introduction to watersheds;Types of Flow: Channel and over-land.	Lecture
4	Week-4	Artesian conditions, development of Karst topography; saltwater intrusions. Aquifers recharge area, infiltration characteristics;	Lecture
5	Week-5	Water efficient landscape designs, rainwater harvesting, artificial recharge, Groundwater management, sources of ground water pollution and its control Flood plains and lake management; recycling of water, waste water treatment;	**Internal Assessment -1**
6	Week-6	Irrigation, types of landscape irrigation systems, terminology of landscape irrigation systems, sprinkler irrigation, sizing irrigation pipe, matching water flow and pressure with pipe size, calculating working water pressure, selecting and locating sprinklers, drip irrigation.	Lecture

7	Week-7	Scope, concept, methods and approach. Historical geomorphology: Landscape evolution models Geomorphologic processes: Endogenic, Exogenic, Extra-terrestrial.	Lecture + Studio
8	Week-8	Major processes and associated landforms. Tectonic, Fluvial, Aeolian, Coastal, Karst, Glacial, and topography caused by ground water, deformations in landforms	Lecture + Studio
9	Week-9	Climatic geomorphology and morphogenic regions: Structural geomorphology, landforms developed on sedimentary sequences, volcanoes and volcanic landforms, pseudo structural landforms.	Lecture
10	Week-10	Climatic geomorphology and morphogenic regions:	Lecture
11	Week-11	volcanic landforms, pseudo structural landforms.	Lecture
12	Week-12		**Mid-semester examination**
11	Week-13	Running water and underground water: Channel networks and drainage basins, Hill slope geomorphology.	Lecture
12	Week-14	Geomorphological features of the Indian subcontinent.	Lecture
13	Week-15	Application of remote sensing in geomorphology	Lecture
14	Week-16	Landforms related to the activities of organisms and man.	Lecture
15	Week-17	. Geomorphological features of the Indian subcontinent.	Lecture
16	Week-18	Extra Class / Prsentations	**Internal Assessment -1**

S. No.	Stages of Evaluation	Weightage
1	First stage: Assessment –1	15
2	Second stage: Mid-semester Examination	20
3	Third stage: Assessment –3	15

Reference Books:

1. Akhauri, S. (2015) Fundamentals of Hydrogeology, Zorba Books.
2. Babar, M.D. (2005) Hydro geomorphology: Fundamentals, Applications and Techniques, New India Publishing Agency.
3. Davie, T. (2017) Fundamentals of Hydrology, T&F/Routledge.
4. Dullo, W.-C. (2018) 'Environmental Geology', International journal of earth science, no. 531.
5. etal., J.A.Z. (2016) Geopedology: An Integration of Geomorphology and Pedology for Soil and Landscape Studies, Springer.
6. Gohau, G. (1990) A History of Geology, revised edition, Rutgers University Press.
7. Huggett, R.J. (2016) Fundamentals of Geomorphology, Taylor and Francis.
8. ISSS (2015) Soil Science: An Introduction, Indian Society of Soil Science (ISSS).
9. Robinson, H. (1969) Morphology and Landscape , 1st edition, University Tutorial Press.
10. Tilley, C. (2010) Interpreting Landscapes: Geologies, Topographics, Identities, 1st edition, Routledge.

Cource Instructors: **Head of Department (I/C):**

sd/-

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Department of Architecture - Landscape Architecture

Course: **Landscape Economics, Project Management, Horticultural Practice and**
Instructors: Kapil Natawadkar

Class: I st Yr M. Arch(LA) I Sem A.Y. 2019-20
Internal Assessment: 50
External Theory Exam: 50
Total Marks: 100
Credits: 2

Contact Periods/ week: 03 periods.(50 min each)
Time Table: Wednesday
Attendance: Min 75%
Min. Passing Marks: 50% each in Internal & External Assessment, 50% in Aggregate

Objective: To develop an integrated understanding on economics, horticultural practice and Professional practice which is a pre-requisite for landscape design and planning.

Out Line of the Course: Surface water flow, Runoff: hydrograph, runoff characteristics of streams, field, flow duration curve,Flew mass curve. Characteristics of Precipitation on India; relationship to vegetation, drainage basins, natural drainage patterns

LECTURE PLAN

WEEK	DATE	TOPIC OF CLASS LECTURE & DISCUSSION	TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS
1	Week-1	Introduction to Subject, overview and application. Horticulture Practice: Nursery establishment and Plant propagation. Common plant pests, diseases and their control	Lecture
2	Week-2	Water Budgeting Equipment for landscape maintenance.	Lecture
3	Week-3	Establishment and maintenance of grass, shrubs and trees with respect to: ground preparation, planting and transplanting, pruning.	Lecture
4	Week-4	Project Management: Types of projects, Various stages of the project,	Lecture
5	Week-5	Project Management: Time and Cost management, Project life cycle .	**Internal Assessment -1**
6	Week-6	Landscape management at the regional scale in relation to soil conservation, water management,grassland management, forestry and agriculture.	Lecture
7	Week-7	Management practices related to urban ecology and urban habitats, such as urban forests, river banks, regional parks and green belts: ecological, economic and administrative issues. Management models.	Lecture

8	Week-8	Economics: Cost and benefits related to open space development; Tangible costs of development; capital and maintenance costs: intangible costs, depletion of natural resources, modification of ecological systems rehabilitation cost, social and cultural changes.	Lecture
9	Week-9	Unit cost of development of open space.	Lecture
10	Week-10	Project management process, Time and Cost management, Project life cycle .	Lecture
11	Week-11	Assembling the land for urban development; legal issues;	Lecture
12	Week-12		**Mid-semester examination**
11	Week-13	social and cultural issues; economic incentives (Dusshara Break)	Lecture
12	Week-14	Professional Practice : Regulations and legal aspects ,Sequence of activities from inception to completion, .	Lecture
13	Week-15	Construction documents, Contract procedure, Contract Documentation,	Lecture
14	Week-16	Types of clients, forms of agreement; conditions of engagement;	Lecture
15	Week-17	scope of work and services to be provided, Scale of professional fees; Professional code of conduct	**Internal Assessment -1**

S. No.	Stages of Evaluation	Weightage
1	First stage: Assessment –1	15
2	Second stage: Mid-semester Examination	20
3	Third stage: Assessment –3	15

Reference Books:

Chandha K.L,(2003) Handbook of Horticulture, Indian Council of Agricultural Research,.
2. Conrad, J. M. (1999). Resource Economics. Cambridge University Press.
3. Daly, H. E. and Farley, J.(2004) Ecological Economics: Principles and Applications. Washington, D.C.: Island Press
4. Field, B. C. and Field, M. K. (2006). Environmental economics. McGraw-Hill/Irwin.
5. Hanley, N., Shogren, J. F., and White, B. (1997). Environmental economics in theory and practice. Oxford university press, New York.
6. John Parker(1989), Landscape Management and Maintenance: A Guide to its costing and organization, Routledge
7. Kumaresan.V,(2015) Fundamentals of Horticulture and Plant Breeding, Saras Publication.
8. Kolstad, C. D. (2003). Environmental economics. Oxford university press.
9. Solow, R. M. (1993). An almost practical step toward sustainability. Resources policy, 19(3):162–172.
10. Littlewood Michael(1998) Tree Detailing. London. Butterworth Architecture.

Cource Instructors: **Head of Department (I/C):**

sd/-

LECTURE PLAN

WEEK	DATE	TOPIC OF CLASS LECTURE & DISCUSSION	TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS
1	Week-1	• Components of Landscape Engineering and their consideration in Site Planning and Landscape design.	Lecture +Interpolation of Contours
2	Week-2	• Appraisal of site factors in large scale developments with above correlation.	Lecture +Visualization of Landforms
3	Week-3	• Site mobilization; Sequence of site activity, site protection measures, site implementation checklist.	Lecture +Road Grading
4	Week-4	• Site mobilization; Sequence of site activity, site protection measures, site implementation checklist.	Lecture +Road Grading
5	Week-5	**Internal Assessment -1**	**Internal Assessment -1**
6	Week-6	• Watersheds and their characteristics, • Landscape Engineering and water conservation;	Lecture +Parking grading
7	Week-7	Understanding Land/environmental modifications and engineering intervention in : • Soil conservation and erosion control measures; • Land reclamation and rehabilitation process;	Lecture +Parking grading
8	Week-8	Understanding Land/environmental modifications and engineering intervention in : • Soil conservation and erosion control measures; • Land reclamation and rehabilitation process; • Disposal of sludge, fly-ash, solid and liquid waste;	ecture +Earthwork computation
9	Week-9	• Strip-mines and quarries;• Transportation corridors • Horticulture and Forestry techniques.	Lecture +Watershed calculations
10	Week-10	• Estimation of costs for civil works and plantation works. Preparation of bill of quantities, specifications and Tender documents	Lecture+Landscape hardscape Detailing
11	Week-11	Preparation of bill of quantities, specifications and Tender documents	Lecture
12	Week-12	**Mid-semester examination**	**Mid-semester examination**

11	Week-13	• Design parameters and certification criteria for green buildings. • Evaluating energy efficient site planning and landscape development.	Lecture +Landscape hardscape Detailing: roof gardens
12	Week-14 Date	• Design of sustainable landscape features such as bio swales, bio retention ponds etc.	Lecture +Hardscape Quantities calculation
13	Week-15	• Evaluating energy efficient site planning and landscape development.	Lecture
14	Week-16	• Energy saving techniques in landscape engineering for planning of services and utilities.	lecture +Hardscape Quantities calculation
16	Week-17	**Internal Assessment -3**	**Internal Assessment -3**

S. No.	Stages of Evaluation	Weightage
1	First stage: Assessment –1	15
2	Second stage: Mid-semester Examination	20
3	Third stage: Assessment –3	15
	Total	50

Reference Books:

Suggested Readings

1. ines, C.W.H.N.T. (2001) Time saver Standards for Landscape Architecture, Mc. Graw Hill.
2. Hack, K.L.a.G. (1984) Site Planning , MIT PRESS.
3. Hamid, S. (1985) Urban Design Process , Van Nostrand Reinhold.
4. Hopper (n.d) Landscape Architectural Graphic Standards Student Ed., John Wiley and Sons Inc.
5. Ingels, J.E. (1992) Landscaping – Principles & Practices , Pelmer Publishers Inc.
6. Lovejoy, D. (1973) Land use and Landscape Planning, Barnes & Noble.
7. Lynch, K. (1994) A Good City Form , MIT PRESS.
8. Mukoda, N. (1990) Street furniture, Bijutsushuppan – sha Ltd.
9. Niall, K.a. (n.d) The Art of Landscape Detail: Fundamentals, Practices and Case Studies.
10. Reid, G.W. (1987) Landscape Graphics, Watson , New York: Guptill publication.

Head of Department/Coordinator:

Cource Instructors:

sd/-

(Kapil Natawadkar)

sd/-

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SCHOOL OF PLANNING AND ARCHITECTURE, VIJAYAWADA
(LECTURE PLAN for AY: 2020-21)

Subject: **APPROPRIATE MATERIALS AND CONSTRUCTION TECHNIQUES (MASA103)**

Class: M. Arch, I Semester

Teacher: Dr. Nagaraju Kaja | Dept: Architecture | Number of Hours:03
Internal Marks: 50 | External Marks: 50 | Total Marks: 100

Objective
To introduce the concepts of Eco-Friendly building materials and alternative methods of building construction.

SL.NO	DATE	TOPIC OF CLASS/ LECTURE /DISCUSSION
1	Week 1	Introduction and discussion on basics in Building Materials/Eco friendly/ Alternative materials
2	Week 2	• Background-Need for material science, Materials used in modern construction, performance • Why construction materials important?
3	Week 3	• Selection of materials • Considerations • Variability of material parameters
4	Week 4	Embodied energy for materials like steel, fly ash bricks, gypsum, steam cured bricks, mud, eco boards etc.,
5	Week 5	Life cycle assessment of materials, Examples
6	Week 6	Assessment I
7	Week 7	Field Trip/ Literature Review
8	Week 8	• Eco Friendly Building Materials • Environmental impact study of building materials w.r.t composition, production, recycling etc. • Physical properties
9	Week 9	Sustainable building Technologies, Properties of Alternative building materials, Walling Materials
10	Week 10	Alternative building materials- Roofing Materials
11	Week 11	Internal Assessment II
12	Week 12	Green Materials • What is Green? Does it work? • Perceptions about Green materials like cost and life etc. • Indoor Environment and Air quality (IEQ & IAQ)
13	Week 13	Bio degradable and Non-Bio degradable materials, Green Ratings for materials
14	Week 14	Envelop materials for interior temperature control, specifications for materials in different materials
15	Week 15	Traditional Building Materials Vs Contemporary Building Materials

Tentative Break-up of Internal Assessment:

S.No.	Categories of Evaluation	Marks	Note
1	Internal test/ Individual Assessment	15	1. Marks allotted at each stage is tentative 2. New stages or categories of evaluation

2	Mid Term Exam	20	may be included if and when the need arises
3	Seminar Presentation	15	

References:

(Nagaraju Kaja)

School of Planning and Architecture: Vijayawada
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Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India

Department of Architecture

Course: **MSAR114 - Daylight and Lighting Design** **Class:** I Yr M. Arch (SA) I Sem A.Y. 2023-24
Instructors: Dr. Janmejoy Gupta **Internal Assessment:** 50
End JURY: 50
Contact Periods/ week: 03 periods (1L+2T) **Total Marks:** 100
Time Table: Tuesday - 09:00-11:45 AM **Credits:** 3
Attendance: Min 75% **Min. Passing Marks:** 40% each in Internal & External Assessment, 40% in Aggregate

Objective: To impart the scientific aspects of daylight and environmental lighting.

LECTURE PLAN

WEEK	DATE	TOPIC OF CLASS LECTURE & DISCUSSION	TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS
1	Week-1 22-08-2023	Electromagnetic spectrum. Visual response visual acquity, Glare & visual comfort.	Lecture/Discussion/Tutorial
2	Week-2	Colour perception, Visual Task Requirements.	Lecture/Discussion/Tutorial
3	Week-3	Side lighting concepts, Top lighting concepts. Designing Atria / Light Courts.	Lecture/Discussion/Tutorial
4	Week-4	Daylight Controls. Daylighting Design, Daylighting Analysis Electrical light sources and Luminaires.	Lecture/Discussion/Tutorial
5	Week-5	Daylight metrics for Task requirements such as point-by-point method, Lumen method, simulation tools. Qualitative calculations and Supplementary Artificial Lighting.	Lecture/Discussion/Demonstration of Daylight Assessment Tool - Ecotect
6	Week-6	Assessment I	**Internal Assessment 1**
7	Week-7	Lighting Design – Effect of light on user orientation, room comprehension, form, structure and materials.	Lecture/Discussion/Tutorial
8	Week-8	Impressions of visual clarity, spaciousness, relaxation, privacy etc. Interior lighting design requirements for offices, factories, commercial interiors, museums and galleries, etc.	Lecture/Discussion/Demonstration of Daylight Assessment Tool (2) - Dailux Lighting Design
9	Week-9	**Mid Term Internal Assessment**	**Mid Term Internal Assesment 2**
10	Week-10	Exterior lighting: Functional requirements, buildings and facades, pedestrian routes and surrounding areas, parking areas and landscape lighting.	Lecture/Discussion/Demonstration of Daylight Assessment Tool (3) - Design Builder - Introduction
11	Week-11	Emergency lighting	Lecture/Discussion/Tutorial
12	Week-12	Cost-effective daylighting design, energy efficiency and maintenance.	Lecture/Discussion/Tutorial
13	Week-13	Lighting cost, performance of lamps and luminaries. Estimating energy use. Energy saving developments.	Lecture/Discussion/Tutorial
14	Week-14	Assessment of Daylight in Buildings	Presentation from students and discussion
15	Week-15 02-12-2023	Assessment of Daylight in Buildings	Presentation from students and discussion

S. No.	Stages of Evaluation	Weightage
1	First stage: Assessment –1	15
2	Second stage: Mid-semester Examination	20
3	Third stage: Assessment –3	15
	Total	50

Suggested Readings:

1. Susan M. Winchip (2017)., 'Fundamentals of Lighting'., Fair Child Books, Bloomsbury., 2nd Edition.
2. Mark DeKay , G. Z. Brown (2014)., 'Sun, Wind & Light'., Wiley., Third Edition.
3. Michael Wilson and Peter Tregenza (2011)., 'Daylighting: Architecture and Lighting Design'., Routledge.
4. Norbert Lechner (2009)., 'Heating, Cooling, Lighting: Sustainable Design Methods for Architects'., Wiley.
5. Hopkinson, R. G (1963)., 'Architectural Physics – Lighting', HMS Office, London.
6. MEBc Schiler (1992)., 'Simplified Design of Building Lighting'., John Wiley & Sons, Inc., New York.
7. Nick V. Baker, A. Fanchiotti, K. Steemers (2017)., 'Daylighting in Architecture: A European Reference Book', Earthson from Routledge. 8. Day Lighting, architecture and Health-Building design Startegies, Mohamed Boubekri, Architectural Press, Elsevier. 9. Building Innovation, A Guide for High-Performance Energy Effcicient Buildings in India, Singh et al, Lawrence Berkley National Laboratory, 2018.

Cource Instructors: **Head of Department :**

sd/- sd/-

Dr J Gupta

School of Planning and Architecture: Vijayawada
(An institution of National Importance under the Ministry of Education, Govt. of India)
S.No. 4/4, ITI Road, Vijayawada – 520 008, Andhra Pradesh, India

Department of Architecture

Course: **MSAR115 - Environmental Codes and Energy Ratings**
Instructors: Karthik Chadalavada

Class: I st Yr M. Arch I Sem A.Y. 2023-24
Internal Assessment: 50
External Theory Exam: 50
Total Marks: 100
Credits: 3

Contact Periods/ week: 03 periods (50 min.each)
Time Table: Thursday (09:00 AM - 11:45 PM)
Attendance: Min 75%
Min. Passing Marks: 50% each in Internal & External Assessment, 50% in Aggregate

Objective:

To expose students the various environmental codes and energy ratings as on date.

Out Line of the Course:

Awareness about applicable environmental codes, and relevant energy rating system procedures and protocols shall be explored.

LECTURE PLAN

WEEK	DATE	TOPIC OF CLASS LECTURE & DISCUSSION	REFERENCES / REMARKS
1	Week-1	**Introduction to the cource and subject** Sustainble Architecture/Building design Origin, Definitions, Concepts & Definitions.	Lecture-1
2	Week-2	Outline understanding of UN frame work on climatic change, Kyoto protocol, Earth Summit, National policies of Sustainable & Energy Efficient Development	Lecture-2
3	Week-3	Introduction and guidelines of latest ECBC, The Indian Green Building Council and LEED,	**Internal Assessment-1** **To make a report by refering journals/research papers in own words and should have APA Style of referencing:** 1) Write in detail about UN frame work convention of climate change 2) What is Kyoto protocol & Earth Summit. Explain about them briefly 3) Write the different national policies on sustainable and energy efficient development.
4	Week-4	The Energy and Research Institute and the GRIHA System, policy guidelines of sustainable architecture etc.	Lecture-4
5	Week-5	Mid-semester Presentations/Exam	**Mid-semester Week**
6	Week-6	IGBC Training Modules	Lecture-5
7	Week-7	Mandatory requirements, the Energy Conservation Act, 2001 (52 of 2001) its legal framework	Lecture-6

8	Week-8	Energy Conservation Act Institutional arrangement and a regulatory mechanism at the Central and State level to embark upon energy efficiency drive in the country	Lecture-7 Mid-Semester Exam
9	Week-9	The Energy Conservation (Amendment) Act, 2010- Main Amendments, Energy Efficiency Measures such as 1.Standard and labelling programme, 2.Demand side management, 3. Energy Conservation Building Code (ECBC),	Lecture-8
10	Week-10	4.Bachat Lamp Yojana (BLY), 5. Strengthening Institutional Capacity of State Designated Agencies (SDAs), 6.State Energy Conservation Fund (SECF), 7.Energy Efficiency in Small and Medium	Lecture-9
11	Week-11	8.Professional certification and accreditation, 9.School Education Programme, 10. Indo-German Energy Efficiency Project, 11.Energy Conservation Awards	Lecture-10
12	Week-12	National mission for Enhanced Energy Efficiency (NMEEE), Perform, Achieve and Trade (PAT), Market Transformation for Energy Efficiency (MTEE),	Lecture-11 Internal Assessment-3
13	Week-13	Energy Efficiency Financing Platform (EEFP), Framework for Energy Efficient Economic Development (FEEED),	Lecture-12
14	Week-14	Partial Risk Guarantee Fund (PRGF), Venture Capital Fund for Energy Efficiency (VCFEE).	Lecture-13
15	Week-15	The Environment (protection) Act 1986, rules to regulate environment pollution and Prevention, control and abatement of environmental pollution and institutional mechanism.	Lecture-14
16	Week-16	Presentation of Assignemnts/ Internal Examination	**Internal Assessment-III** **To Carrout detailed GRIHA/IGBC Green Rating Self Evaluation for an Existing Building/Proposed Design in a presentation format**

S.No.	Category of Evaluation	Marks	Note
1	Assessment – I:	15	*The Marks allotted at each stage is tentative. Categories of evaluation may be increased or decreased (merged) on need-basis*
2	Mid semester exam	20	
3	Assessment – III:	15	

References:

1. International Building Code – 2012., International Code Council., 2011.
2. National Building Code – 2016., Bureau of Energy Efficiency., Ministry of Power., Govt. of India.
3. Linda Reeder (2010)., 'Guide to Green Building Rating System'., Wiley.
4. The Environment (protection) Act 1986. Link: https://indiacode.nic.in/bitstream/123456789/4316/1/ep_act_1986.pdf – accessed on 06.07.2019.
5. The Energy Conservation (Amendment) Act 2001, and Amendments - http://extwprlegs1.fao.org/docs/pdf/ind167070.pdf – accessed on 06.07.2019.
6. Energy conservation building code 2017. Link: https://beeindia.gov.in/sites/default/files/BEE_ECBC%202017.pdf - – accessed on 06.07.2019.
7. Eco-Niwas Samhita 2018. Link: https://www.beeindia.gov.in/sites/default/files/ECBC_BOOK_Web.pdf – accessed on 06.07.2019.
8. National building code – India. NBC 2016 Vol 01 - Link: https://ia800601.us.archive.org/13/items/nationalbuilding01/in.gov.nbc.2016.vol1.digital.p df. . NBC 2016 Vol 02 - Link: https://ia800601.us.archive.org/11/items/nationalbuilding02/in.gov.nbc.2016.vol2.digital.p df. – accessed on 06.07.2019.
9. International building code. IBC 2018. Link: https://www.ci.independence.mo.us/userdocs/ComDev/2018%20INTL%20BUILDING%2 0CODE.pdf – accessed on 06.07.2019.
10. International Energy Conservation Code.IECC2018 Link: https://basc.pnnl.gov/resources/2018-iecc-international-energy-conservation-code – accessed on 06.07.2019.
11. Bureau of Energy Efficiency, Ministry of Power, Govt. of India. Link: https://beeindia.gov.in/ – accessed on 06.07.2019.
12. LEED. Link: https://igbc.in/ – accessed on 06.07.2019.
13. GRIHA. Link: http://www.grihaindia.org/ – accessed on 06.07.2019.

Cource Instructors: **Head of Department:**

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(Karthik Chadalavada) (Dr. Uma Sankar B)