



JBR ARCHITECTURE COLLEGE

HYDERABAD

(Promoted by Joginpally B R Educational Society)

(Approved by Council of Architecture, New Delhi; Affiliated to Jawaharlal Nehru Architecture and Fine Arts University, Hyderabad and ISO 9001-2015 Certified)

Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum.

Name of cross cutting issue	Programme	Name of the course	Regulation	Course code	Year/ Sem	Academic Year
Environment and Sustainability	B. Arch	Environmental Studies	R17	GN17B1.2A	I/I	2017-18, 2018-19, 2019-20, 2020-21, 2021-22
	B.Arch.	Environmental Studies	R22	GN22B2.2A	I/II	2022-23
	B. Arch	Climatology	R17	AR17B3.7C	II/III	2018-19, 2019-20, 2020-21, 2021-22
	B. Arch	Climatology for Built Environment	R22	AR22B3.7C	II/III	2022-23
	B. Arch	Environment Responsive Design	R17	AR17B6.6C	III/VI	2019-20, 2020-21, 2021-22, 2022-23
	B. Arch	Energy Conservation Building Code	R17	AR17B7.3C	IV/VII	2020-21, 2021-22, 2022-23
	B. Arch	Water Supply, Sanitation and Hygiene	R22	AR22B4.6C	II/IV	2022-23
	M. Arch (Interior Design)	Environmental science for Interiors	R11	ID 1.3	I/I	2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Environmental Design Studio-I	R17	ED 1.1	I/I	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Energy Simulations E.C.B.C -1	R17	ED 1.2	I/I	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Resource Management and Ecology	R17	ED 1.4	I/I	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Sustainable Development and Planning	R17	ED 1.5	I/I	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Environmental Design Studio - II	R17	ED 2.1	I/II	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Energy Simulations E.C.B.C - II	R17	ED 2.2	I/II	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Building Energy Management	R17	ED 2.4	I/II	2018-19, 2019-20, 2020-21, 2021-22, 2022-23



[Signature]
Principal
JBR Architecture College
Joginpally (V)

Campus: Bhaskar Nagar, Yenkapally (V), Moynabad (M), R.R. Dist - 500 075, Telangana State, India.
Tel: 08413 - 235240/ 41 / 42, +91 - 9121155517/ 18, ✉ jbrarchitecture@jbggroup.org.in, 🌐 www.jbrac.edu.in

Head Office: 6-3-248/1/1/A, 4th Floor, Bhaskar Plaza, Banjara Hills, Road No.1, Beside Care Hospital, Hyderabad- 500 034.
Tel : +91 40 23391979, 23301523



JBR ARCHITECTURE COLLEGE

HYDERABAD

(Promoted by Joginipally B R Educational Society)

(Approved by Council of Architecture, New Delhi; Affiliated to Jawaharlal Nehru Architecture and Fine Arts University, Hyderabad and ISO 9001-2015 Certified)

	M. Arch (Environmental Design)	Environmental laws	R17	ED 2.5	I/II	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Sustainable Site planning and landscape design	R17	ED 2.6	I/II	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Advanced Environmental Design lab/ Studio-III	R17	ED 3.1	II/III	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Environmental Impact Assessment	R17	ED 3.2	II/III	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Environmental Rating Systems	R17	ED 3.3	II/III	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Sustainable practices in Waste Management	R17	ED 3.4	II/III	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Environmental Infrastructure	R17	ED 3.5	II/III	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Environmental Economic Feasibility	R17	ED 4.1	II/IV	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	M. Arch (Environmental Design)	Environmental Design Thesis	R17	ED 4.2	II/IV	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
Gender	B. Arch	Value Education	R17	GN17B2.2A	II/III	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
Professional Ethics, Human Values	B. Arch	Value Education	R17	GN17B2.2A	II/III	2018-19, 2019-20, 2020-21, 2021-22, 2022-23
	B. Arch	Universal Human Values	R22	GN22B3.1A	II/III	2022-23
	B. Arch	Professional Practice & Building Codes	R17	AR17B10.2 C	V/X	2022-23
	M. Arch (Environmental Design)	Environmental laws	R17	ED 2.5	I/II	2018-19, 2019-20, 2020-21, 2021-22, 2022-23



PRINCIPAL

J.B.R. Architecture College

Campus: Bhaskar Nagar, Yenkapally (V), Moinabad (M), R.R. Dist - 500 075, Telangana State, India
 Tel: 08413 - 235240/ 41 / 42, +91 - 9121155517/ 18, ✉ jbrarchitecture@jbrgroup.org, www.jbrac.edu.in

Head Office: 6-3-248/1/1/A, 4th Floor, Bhaskar Plaza, Banjara Hills, Road No.1, Beside Care Hospital, Hyderabad- 500 034.
 Tel : +91 40 23391979, 23301523

GN17B1.2A ENVIRONMENTAL STUDIES

L/s: 2/Wk Int:50 End Exam: 50 Total: 100 End Exam: 3 hrs Cr:2

Course Overview: A compulsory subject for all the undergraduate students of various discipline highlights significance of maintaining balance and sustainability of various components of the environment.

Objectives of the Course : To sensitize the students towards sustainable environment.

Course Contents:

Unit – I

Environmental studies – Introduction: - Definition, scope and importance, Measuring and defining environmental development indicators.

Unit – II

Environmental and Natural Resources: Renewable and non-renewable resources - Natural resources and associated problems - Forest resources - Use and over - exploitation, deforestation, case studies - Timber extraction - Mining, dams and other effects on forest and tribal people - Water resources - Use and over utilization of surface and ground water - Floods, drought, conflicts over water, dams-benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. - Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit - III

Basic Principles of Ecosystems Functioning: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers.- Energy flow in the ecosystem Ecological succession. - Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Unit - IV

Biodiversity and its conservation: Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values -



[Signature]
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

Biodiversity at global, National and local levels. - India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit - V

Environmental Pollution: Definition, Cause, effects and control measures of:

a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

Unit - VI

Social Issues and the Environment: From unsustainable to sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, and watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. - Consumerism and waste products. -Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act - Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

Unit - VII

Human Population and the Environment: Population growth, variation among nations. Population explosion - Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. -HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. -Case Studies.

Unit - VIII

Field work: Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.

TEXT BOOK:

ErachBharucha, A Text Book of Environmental Studies for Undergraduate Courses, University Grants Commission.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

GN22B2.2A: ENVIRONMENTAL STUDIES

Periods Per Week			CREDITS	Marks			End Exam Type
L/T/S	P/F/O	Total		Internal	External	Total	W/J/S/P
0	2	2	0	50	50	100	J

Objectives of the Course:

- Creating awareness among students about Environment and ecosystem.
- Inculcating the importance of bio-diversity and its conservation in students.
- Imparting knowledge to students about natural resources and how they need to be consumed.
- Sensitizing students to the issues involved in creating sustainable environment and framing the policies and practices in achieving it. Prepare models to present the architectural design concepts.
- Establishing the need of co-existence between the human community and the environment.

UNIT I: THE ENVIRONMENT AND ECOSYSTEM

Environment and Environmental Studies: Definition, concepts, components and importance.

- 1.1 Ecosystem: Structure and function of ecosystem.
- 1.2 Food chain, food web and ecological pyramids.
- 1.3 Bio geo chemical cycles in ecosystems (Carbon, Nitrogen and Phosphorous cycles)
- 1.4 Ecosystem: Structure and function of ecosystem.
- 1.5 Food chain, food web and ecological pyramids.
- 1.6 Bio geo chemical cycles in ecosystems (Carbon, Nitrogen and Phosphorous cycles)
- 1.7 Ecosystem: Structure and function of ecosystem.
- 1.8 Food chain, food web and ecological pyramids.
- 1.9 Ecological succession: Definition, types, concept and process (Hydrosere, Xerosere)
- 1.10 Bio geo chemical cycles in ecosystems (Carbon, Nitrogen and Phosphorous cycles)

UNIT II: BIODIVERSITY AND ITS CONSERVATIONS

- 2.1 Definition, concept, levels and values of biodiversity.
- 2.2 Biodiversity of India, India as a mega diversity nation, hotspots of biodiversity.
- 2.3 Threats of biodiversity (habitat loss, poaching of wildlife and man wildlife conflicts).
- 2.4 Conservation of biodiversity: In-situ conservation: ex-situ conservation.
- 2.5 Eco-tourism - concept of protected area network with special reference to wild life reserves in the region.



[Signature]
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Minnabadi (M), R.R. Dist-500 075, T.S.

UNIT III: NATURAL RESOURCES AND THEIR CONSERVATION

- 3.1 Forest Resources: Uses and over-exploitation of forests and consequences of deforestation.
- 3.2 Water Resources: Use and consequences of over-utilization - concept of rain water harvesting and watershed management - water conflicts.
- 3.3 Food Resources: Sources of food - impact of modern agriculture on environment (Fertilizer-pesticide problem, water logging and salinity) - organic farming.
- 3.4 Energy Resources: Renewable and non-renewable energy sources - growing energy needs and alternate energy sources.
- 3.5 Land Resources: Global land use patterns, soil erosion, and desertification and wasteland reclamation - The Save Soil movement.

UNIT IV: ENVIRONMENTAL POLICIES AND PRACTICES

- 4.1 Climate changes - global warming - ozone layer depletion - acid rain and their impacts on human communities and agriculture.
- 4.2 Environment Laws: Environmental Pollution.
Definition, Cause, effects and control measures of:
(a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards

Role of an individual in pollution control & pollution case studies.

Wildlife Protection Act; Forest Conservation Act; Water (Prevention and control of Pollution) Act; Air (Prevention & Control of Pollution) Act; Environment Protection Act; Biodiversity Act.

- 4.3 International agreements: Montreal Protocol; Kyoto Protocol and Climate Negotiations; Convention on Biological Diversity (CBD).
- 4.4 Protected area network - tribal populations and rights - human wildlife conflicts in Indian context.

UNIT V: HUMAN COMMUNITIES AND THE ENVIRONMENT

- 5.1 Human population growth: Impacts on Environment, Human Health and Welfare.
- 5.2 From unsustainable to sustainable development - Urban problems related to Energy - Water conservation, rainwater harvesting, and watershed management - resettlement and rehabilitation of people & case studies.
- 5.3 Environmental Disaster: Natural disasters - floods, earthquake, cyclones, tsunami and landslides; Man-made disasters: Bhopal and Chernobyl disasters - Disaster Management.
- 5.4 Environmental movements: Bishnois Chipko, Silent Valley, Big Dam Movements.
- 5.5 Environmental ethics: Role of gender and cultures in environmental conservation issues and possible solutions.
- 5.6 Environmental education and public awareness - Consumerism and waste products - Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.



[Signature]
PRINCIPAL
J.B.R. Architecture College
Bheskar Nagar, Yankapally (V),
Moinabari, M. R. R. Dist-500 075, T.S.

Reference Books:

1. Environmental Studies: From Crisis to Cure by R. Rajagopalan (Oxford University Press).
2. Essentials of Ecology and Environmental Science by S.V.S. Rana (Prentice Hall India Learning Private Limited, New Delhi).
3. Introduction to Environment Management, M.M. Sulphay & M.M. Safer (Prentice Hall India Learning Private Limited, New Delhi) (2015).
4. Environmental Law by Surender Kumar Sharma (Wisdom Press, New Delhi) (2015).
5. Ecology and Environment by P.D. Sharma (Rastogi Publications) (2018).
6. Environmental Science by S.C. Santra (New Central Book Agency, Kolkata) (2016).
7. Text Book of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission (Orient Blackswan Pvt. Ltd., New Delhi).
8. Sustainable Development Goals and Indian Cities – Inclusion, Diversity and Citizen Rights (Part I), edited by Ashok Kumar & D.S Meshram (Routledge India, New Delhi).

Course Outcomes:

At the end of the semester, student should be able to:

1. Define the basic concepts of the environment & eco-systems and their concerns and issues.
2. Apply their knowledge for efficiently conserving natural resources and achieving sustainable development.
3. Analyze the importance of biodiversity and its conservation.
4. Synthesize the policies and practices formulated by the Government and other agencies and propose alternative solutions and strategies.
5. Evaluate the relationship existing between human communities and their surrounding environment.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yeekapally (V),
Moinabadi (M), R.H. Dist. 500 075, T.S.

Unit –VIII

Solid Waste Disposal: Properties of Solid Wastes: Physical and chemical composition of municipal solid wastes, waste generation rates. Management of Solid Wastes in India: Prevalent SWM practices and deficiencies: Storage of waste at source, segregation of wastes, primary collection of waste, transportation of waste, disposal of wastes.

Disposal of Wastes: Sanitary landfilling, Composting, Incineration, Pyrolysis – advantages and limitations.

Unit – IX

Roads and Pavements – Different types, water bound macadam, tar bitumen, asphalt and Cement concrete roads, soil stabilization, types of paving-murram, brick, and stone paving. Drainage of roads, sub-drains, culverts, ditches and gutters.

To give the learning in this subject a more practical orientation seminars by industry or trade related organisations or field/site visits should be organized. A weightage of 5% in the overall Internal Assessment in the subject should be reserved for students attending these seminars/site visits and maintaining the records/ observations as required by the subject faculty.

References :

Hussain, S.K. T.B. of Water supply and Sanitary Engineering, 3rd ed. Oxford and IBH Pub. Ltd., New Delhi, 1994.

Kshirsagar, S.R. Water Supply Engineering, 6th ed. Roorkee Pub., Roorkee, 1980. Rangwala, S.C. Water supply and Sanitary Engineering : Environmental Engineering, 19th ed. Charotar Pub.

AR17B3.7C CLIMATOLOGY

L/s: 3/Wk Int: 50 End Exam: 50 Total: 100 End Exam: 3hrs Cr:3

Course Overview:

Science (tools, data, standards, methods and principles) of building design and site planning as related to climate, particularly to tropical climates as found in India.

Objectives of the Course:

To equip the student with the basic understanding of climatic types in India, and the impact on requirements of building design and site planning; to introduce them to the basic science of building design and site planning for thermal comfort, daylighting and natural ventilation; familiarize them with the data, methods, principles, standards and tools for planning and designing for climatic comfort

Expected Skills / Knowledge Transferred:

The student should be able to 'predict' climatic conditions in a given building (simple residence) and undertake redesign for given parameters



Course Contents:

Note: The topics here to be dealt with keeping in mind Indian climatic conditions. NBC and BIS guidelines / standards have to be introduced at all relevant contexts.

Unit – I

Introduction to Building Climatology:

Climate and built form interaction. Global Climatic factors, elements of climate, graphic representation of climatic data, Mahoneys Tables, macro and micro climate; challenge of rapid, extreme environmental change

Unit – II

Tropical Climates:

Definition, classification of tropical climates, characteristics of different climatic zones, Design considerations for warm-humid, hot-dry, composite and upland climates.

Unit – III

Thermal Comfort:

Thermal comfort factors, Physiological aspects, Body heat balance, comfort range, comfort charts.

Unit – IV

Heat flow through Buildings:

Basic principles of heat transfer through buildings, performance of different materials, Periodic heat flow.

Unit – V

Sun and the Design process:

Solar geometry, Solar charts, Sun angles and shadow angles, orientation for sun, sun control, design of shading devices, building form and heat gain, basic principles of day lighting, sunlight and glare.

Unit – VI

Natural Ventilation:

Air movement around and through buildings, Orientation for wind, stack effect, Induced ventilation.

Unit – VII

Passive Cooling:

Passive methods of Cooling, traditional and contemporary; roof pond, desiccant cooling, evaporative Cooling, and earth sheltered buildings etc.

Site Planning (including landscaping) and building planning and design considering climate factors



Detailed appraisal/analysis of climatological performance of an existing residence and or a workplace; followed by redesigning or the same to improve climatological performance.

Reference books:

Koenigsberger, O.H. and Others. Manual of Tropical Housing and Building. Orient Longman, Chennai, 2003.

Konya, Allan. Design for Hot Climates.

Kukreja, C.P. Tropical Architecture. Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 1978.

Markus, T.A. and Morris. E.N. Buildings, Climate and Energy. Pitman Pub. Ltd., London, 1980.

Olgay and Olgay. Solar Control and Shading Devices.

GN17B2.2A VALUE EDUCATION

L/s: 2/Wk Int: 50 End Exam: Nil Total: 50 End Exam: Nil Cr:2

Course Overview: To provide guiding principles and tools for the development of the whole person, recognizing that the

individual is comprised of Physical, Intellectual, Emotional and Spiritual dimensions.

Knowledge Transfer /Expected Skills:

- To help individuals think about and reflect on different values.
- To deepen understanding, motivation and responsibility with regard to making personal and social choices and the practical implications in relation to themselves and others, the community and the world at large
- To inspire individuals to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening them.

Unit I

Value Education—Introduction – Definition of values – Why values? – Need for Inculcation of values – Object of Value Education – Sources of Values – Types of Values: i) Personal values ii) Social values iii) Professional values iv) Moral and spiritual values Behavioral (common) values

Unit II

Personal values – Definition of person – Self-confidence – Relative and absolute confidence, being self-determined, swatantrata (loosely equivalent to freedom).

Self-discipline – Self Assessment – Self-restraint –Self motivation – Determination – Ambition – Contentment

Self-respect and respect to others; expression of respect



AR22B3.7C CLIMATOLOGY FOR BUILT ENVIRONMENT

Periods Per Week			CREDITS	Marks			End Exam
L/T/S	P/F/O	Total		Internal	External	Total	W/J/S/P
2	1	3	3	50	50	100	W

Objectives of the course:

- Understand systems that affect global climate and how the country has been divided into climatic zones.
- Understand factors that affect thermal gain in a built envelope and what indoor conditions are ideal for indoor human comfort also in the context of external climate.
- Sensitize the students to micro climate at site level and what elements may be used to modify micro climate for human comfort
- Train the students to modify building volumes and use proven passive design strategies to ensure thermal comfort
- Sensitize students to best practices in the area of climate sensitive design

Unit I: Macro Climate:

Climate change, Global climatic factors: global wind currents and ocean currents , movement of earth around the sun, shape of the earth, angle of tilt, earth rotation and revolution ; Elements of climate: Solar radiation, temperature, humidity, wind velocity, precipitation; climatic zones in India: hot and dry, warm-humid, composite and temperate,cold; measurement of climatic data, instruments and measurement of climatological data, climatic data required for design of buildings and interpretation of graphical data.

Unit II: Thermal Comfort

Importance of thermal comfort in buildings: thermal comfort factors: body's heat production and regulatory mechanisms, heat loss in various environments body heat balance deep body temperature; thermal comfort indices CET (corrected effective temperature), interpretation of psychometric charts, bioclimatic chart, human comfort ranges and levels. Basic principles of heat flow through buildings: conduction, convection, radiation, thermal properties of building materials steady state calculations and introduction to periodic heat flow.

Unit III: Analysis of Climate

Analysis of microclimate from macro climate, site and the environs, factors effecting the micro climate at the site, instruments and methods used to carry out measurements of climate data: temperature, humidity, wind, precipitation, driving rain, sky conditions, solar radiation, vegetation, graphical representations of data,

Use of tools like mahoney's tables; climate consultant for analysing the requirements of buildings in relation to climate.



[Signature]
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yankapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

Unit IV: Passive Solar Design Technologies

Understanding Solar charts, orientation-siting of building with respect to sun and design of shading devices; passive cooling devices: humidity control, use of evaporative cooling, physiological cooling, convective cooling, ground cooling-earth air tunnel.

courtyard houses , night time cooling, reflective surfaces and radiant barriers, thermal mass, cavity walls, cool roof and green roof, stack effect ,wind catchers, Trombe walls and sun room,.

Unit V: Ventilation and micro climate control through Landscape

Ventilation: interpretation of wind-rose diagrams, Beaufort wind force scale, predicting air movement around site, airflow through buildings, natural ventilation: windward and leeward sides, position and size of openings, cross ventilation, borrowed ventilation, forced ventilation, window floor ratio, sick building syndrome.orientation and positioning of windows.

Plantation for: shading, wind buffer, dust control, minimizing the reflected ground factor in radiation, cooling through evapo-transpiration, use of water: evaporative cooling, misters.

Unit VI: Design and Best Practices (for internal evaluation)

Design process: Forward analysis, plan development, elements design stages, Design strategies for each climate (ref. Koenigsberger); effect of orientation , design of shading devices , heat flow calculations.

Case study and climatic analysis of a local model building. Class discussions on national and International best practices as per climate and typology of building.

Reference:

1. Markus, T.A. and Morris. E.N., Buildings, Climate and Energy. Pitman Pub. Ltd., London, 1980.
2. Narashimhan ,An Introduction To Building Physics ,CBRI, 1974
3. Otto H Koenigsberger, O. H., Ingersoll, T. G., Mayhew, Manual Of Tropical Housing And Building – Part I – Climatic Design, Orient Longman Private Limited, 1975
4. Fred Pearce, Climate and Man, 1989
5. RamachandraGuha, Environmentalism: A Global History, 1999
6. Sustainable Buildings - Design Manual: Vol 2,TERI
7. Energy-efficient buildings in India, The Energy and Resources Institute (TERI), 2001
8. MiliMajumdar and MinniSastry, Green Homes and Workplaces, TERI
9. Building wise, CSE, 2021
10. Energy conscious Architecture, Ministry of non-conventional energy resources, GOI, Jan 2005.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yankooly (V),
Mandali, M. R.R. Guvva 075, T.S.

E-resources:

https://www.teriin.org/	TERI (The Energy and Resources Institute): This website provides information on sustainable development in India, including research on building energy efficiency and renewable energy.
https://www.cseindia.org/	Centre for Science and Environment (CSE) : This website provides information on sustainable development in India, including research on building energy efficiency and renewable energy.
https://thearchspace.com/5-different-climate-zones-in-india-and-their-important-characteristics/	5 different climatic zones in India.
https://youtu.be/6D4ow2WulVA	Heat Flow through buildings NPTEL (IIT Roorkee).
https://archive.org/download/nationalbuilding02/in.gov.nbc.2016.vol2.digital.pdf	NBC national building codes Part.8.

COURSE OUTCOMES

After successfully completing the course the student will be able to:

AR22B3.7C.1	Apply knowledge of macro level climatic data to the site level
AR22B3.7C.2	Understand and analyse thermal comfort factors effecting the human body.
AR22B3.7C.3	Evaluate potential of site for comfortable micro climatic conditions
AR22B3.7C.4	Develop climate sensitive design strategies
AR22B3.7C.5	Create small scale structures which can achieve comfortable indoor thermal conditions through passive design

CO-PO mapping

CO\PO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PS-01	PS-02
AR22B3.7C.1	1	2	-	1	2	-	-	-	2	-	-	1		
AR22B3.7C.2	2	3	-	1	2	1	-	-	-	-	-	-		
AR22B3.7C.3	3	1	3	3	-	-	1	1	-	-	2	-		
AR22B3.7C.4	3	2	3	3	-	-	1	1	-	-	-	1		
AR22B3.7C.5	2	1	1	2	2	1	-	-	-	-	-	-		



[Signature]
PRINCIPAL
J.B.R. Architecture College
 Bhaskar Nagar, Yenkapally (V),
 Mainabad (M), R.R. Dist-500 075, T.S.

Khosla, R.K. Urban and Rural Development in India.

Patterson, T. William. Land-use Planning Techniques of Implementation.

Rama Reddy, Padala & Srinivas Reddy, Padala. Commentates on Land Reforms Laws in Andhra Pradesh.

Rame Gowda, K.S. Urban and Regional Planning. Univ. of Mysore, Mysore, 1972.

Rangwala, S.C. & Others. Town Planning, 18th ed. Charotar Pub. House, Anand, 2003.

Rappoport, Amos. House, Form and Culture.

Singh, Alok Kumar, & Others (ed). Strategies in Development Planning.

AR17B6.6C ENVIRONMENT RESPONSIVE DESIGN

L/s: 3/Wk Int: 50 End Exam: 50 Total: 100 End Exam: 3 hrs Cr:3

Course Overview:

The course focuses on developing an understanding regarding environmental sustainability and environmentally responsible green buildings. It address the design concerns in architecture to develop resource-efficient buildings that have minimum adverse impact on the natural environment.

The emphasis is to gain an understand regarding the existing concepts, ideas and processes in Architecture and built environment and also recognize rapidly emerging building solutions and technological initiatives that complement current practices in order to attain human health and environmental goals.

Objectives of the Course:

Develop skills to promote eco-friendly characteristics in the area of architecture and buildings and identify crucial technologies, facilities and applications that help in developing green buildings.

Course Contents:

Unit - I

Introduction to Macro Environment: Elements of climate, weather, Water cycle, Carbon cycle, Environmental quality, Deforestation, climatic change, Ozone depletion and implications.

Unit - II

Micro-environment: Natural environment Vis a vis built environment. Living environment Characteristics and components of Urban Ecosystem solar radiation, heat flow, air-movement, Land use, drainage and sanitation.

Unit - III

Concepts of green field development: Brown field development, environmental



impact and ecological balance, FAR, layouts, sustainable Site development, vegetation, landscape elements, alternative services and technologies, rain water harvesting, on site sewerage retention, treatment, recycle and reuse

Unit - IV

Building Resources: Passive energy system design, Building envelope, orientation and components of building fabric and Shading, High rise buildings, modular building Construction, curtain walls, Sourcing and recycling of building materials, alternative Calcareous, metallic and non-metallic, materials

Unit - V

Building Infrastructure: Active Energy Systems in buildings, Utilities and services, building automation. electro-mechanical systems, lifts and transportation, captive power plant and equipment, operation & maintenance

Unit - VI

Indoor air quality: fresh air requirements standards, Sick Building Syndrome, VOC and pollutants.

Unit - VII

Introduction to building rating systems: building auditing, points system, components, and weight age, agencies and institutions, GBC, TERI etc, green buildings in the contexts of Indian sub-continent,

Reference books:

Green Building Technologies - Godrej Centre CII a Madhapur, Hyderabad.

Greening Building – Green Congress, US.(web).

HSMI. Sustainable Building Technology – HUDCO, HSMI (Human Settlement Management Institution, New Delhi.

Koenigsberger, O.H. and Others. Manual of Tropical Housing and Building. Orient Longman, Chennai, 2003.

Odum, P. Eugene. **Ecology and Environments**, 2nd ed. Oxford and IBH Pub., New Delhi.

TERI, The Building Energy Audit – TERI (Tata Energy Research Institute).

HMDA Hyderabad- Green building guidelines



Unit - IV

Swimming Pools: Pool and tank design, patio, finishes, Water circulation, cascades, channels, filtration and water treatment, Water quality and disinfection, balancing tank.

Unit - V

Hotel services: Specialty services required for hospitality industry, Laundry services, Kitchen services, Channeled Music, Internet,

Unit – VI

Environmental services: waste generation in Industrial buildings, various types of waste, solid, liquid, gas, treatment and disposal facilities, waste generation in hospital buildings, design provision for its disposal,

Unit - VII

Alternative energy sources for buildings: hot water solar energy system, applications of photo voltaic cells, biomass digesters, wind energy.

Reference books:

Faber, Oscar and Kell, J.R. Heating and Air-Conditioning of Building. Architectural Press, Surrey, 1945.

Prasad, Manohar. Refrigeration and air-conditioning, 5thEd. New Age Intl. Pub., New Delhi, 1996.

Tiwari, Satish. Water and Energy resources.

AR17B7.3C ENERGY CONSERVATION BUILDING CODE

L/s: 5/Wk Int: 50 End Exam: 50 Total: 100 EndExam: Practical Cr:5

Course Overview: This will give an overall understanding and importance of Energy Conservation in built environment and will also help students to design buildings which are ECBC compliant.

Objective of the Course: To enable students to design and evaluate code compliant buildings.

Expected Sills/Knowledge Transferred: Basic understanding of building energy codes, compliance methods, day lighting, and whole building energy simulations.

Course Contents:

Theoretical Sessions

Unit I

Building Physics and Energy in built environment: Physics of Heat – Heat and temperature, Types of Heat flow, Laws of thermodynamics, thermal behaviour of buildings – Solar control, ventilation, Steady State heat flow, Dynamic response



of buildings, Thermal Comfort – Thermal balance and comfort, factors of Comfort, adjustment mechanisms, comfort indices, comfort zone, HVAC, Thermal properties of materials – Glass (SHGC, VLT, U value), walls, other building materials.

Unit II

International Practices - Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings, General status in regions in Europe, North America, Japan, New Zealand, Australia, China, Energy Codes in Singapore, Malaysia, Duabi and Middle east, ASHRAE 90.1, ASHRAE 90.2 IECC, Title 24.

Unit III

ECBC Scope, Compliance and approach: Energy efficiency performance levels, building systems, precedence, building classifications, energy performance index, compliance approaches and requirements, approved analytical tools, administrative requirements, compliance documents, Benchmarking and Star Labelling.

Unit IV

ECBC Building Envelope: Mandatory requirements – Fenestration, opaque construction, daylighting, building envelope sealing, Prescriptive requirements – roof, opaque external walls, vertical fenestration, skylights, Building Envelope trade – off method, standard building EPF calculation.

Unit V

Comfort Systems and Controls: Mandatory requirements – ventilation, minimum space conditioning equipment efficiencies, controls, additional controls for ECBC + and super ECBC, additional controls for super ECBC buildings, piping and duct work, system balancing, condensers, Service water heating – solar water heating, heating equipment efficiency, other water heating systems, piping insulation, heat traps, swimming pools, Prescriptive requirements – pumps, cooling towers, economisers, variable flow hydronic systems, boilers, energy recovery, total system efficiency – alternate compliance approach, low energy comfort systems.

Unit VI

ECBC Lighting and Controls: Mandatory requirements – lighting controls – automatic lighting shut off, space control, control in daylight areas, centralised controls for ECBC + and super ECBC buildings, Exterior lighting controls, additional controls, exit signs, Prescriptive requirements – interior lighting power, building area method, space function method, Installed interior lighting power, Exterior lighting power.

Unit VII

ECBC Electrical and renewable systems: Mandatory Requirements – Transformers, energy efficient motors, Diesel generators sets, check metering and monitoring, power factor correction, power distribution systems, uninterruptible power supply, renewable energy systems.



Unit VIII

Daylighting – Daylighting simulation, manual daylighting compliance method.

Unit IX

Whole building performance method and Energy Simulation- General Scope, compliance, annual energy use, trade-off limited to building permit, documentation requirements, Mandatory requirements, Simulation requirements – energy simulation program, climate data, compliance calculations, calculating energy consumption of proposed design and standard design –energy simulation model, HVAC systems, compliance thresholds for ECBC Compliant, ECBC + and super ECBC Buildings, maximum allowed EPI ratios, Schedules.

Practical Sessions

Unit X

How simulation software works, geometry of buildings, material and construction, openings and shading, lighting and controls.

Recommended software for whole building: Design Builder/Open studio/Synergy.

Unit XI Heating and cooling design, Unitary HVAC Systems, Central HVAC System, simulation parameters natural ventilation.

Unit XII Building energy code compliance, project: small office, large office, single family residence.

Unit XIII Daylight Simulation: Recommended Software: DIVA for RHINO/DAILUX EVO 6/Open Studio.

References:

Steven V Szokolay. Introduction to Architectural Science: The Basics of Sustainable Design. Architectural Press, Second Edition, 2010.

Vishal Garg, Jyothirmay Mathur, Surekha Tatali, Aviruch Bhatia. Building Energy Simulation: A workbook using Design Builder. CRC Press. 2017.

Energy Conservation Building Code 2017. Bureau of Energy Efficiency. New Delhi. 2017

American Society of Heating, Refrigerating and air conditioning Engineers, Inc. Standards (ANSI/ASHRAE) 90.1 –Energy Standards for Buildings except Low-rise residential buildings. 2016.

American Society of Heating, Refrigerating and air conditioning Engineers, Inc. Standards (ANSI/ASHRAE) 90.2 –Energy Standards for Low-rise residential buildings. 2016.

Jens Lausts. Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings. International Energy Agency (IEA) Information paper. March 2008.



AR22B4.6C WATER SUPPLY, SANITATION AND HYGIENE

Periods Per Week			CREDITS	Marks			End Exam Type
L/T/S	P/F/O	Total		Internal	External	Total	W/J/S/P
3	0	3	3	50	50	100	W

Objectives of the course

The objective of the subject is to enable students to understand and apply:

- To enrich the knowledge of students in understanding the need and importance of building services at building and urban level with standard bye laws as per BIS.
- Water distribution systems and its requirements at different scales such as building, site, neighborhood, etc.
- To equip the fundamentals to design plumbing systems for different sizes of buildings.
- Calculations and disposal of rainwater and solid waste disposal.
- Formulating sustainable solutions for real world problems.

UNIT I: Water Supply

Sources of water supply – Surface and Underground, standards of purity-pH levels and treatment of water- Conventional water **treatment** – sedimentation, coagulation, filtration and disinfection, Impurities, and treatment; Hardness of water – softening, qualities of potable water. Domestic water **distribution** system- Continuous, intermittent, service **connections**, water meters, capacity of **storage tanks** - overhead tank, sump and pumping plants required, **calculation** of water consumption. **Demand** of water for domestic, commercial, industrial, and public utility purposes as per **BIS standards**. Domestic water piping systems. Hot and cold-water distribution within the building; **Layout** of water supply lines in a domestic house. Types of fittings to Kitchen and bathrooms, etc. Water supply to high rise buildings: **problems** encountered, and **systems** adopted. Energy Efficient Pumping Systems as per Eco-Niwas Samhita 2021 **recommendations**. New **trends** in water supply and plumbing to domestic and commercial level (**Green building Concepts** on water supply and plumbing)

UNIT II: Plumbing and Sanitary Appliances

Building service **connections**- Domestic and Commercial - Hot and Cold-water **distribution systems** and **design** in small and multi storied buildings, **Types** of Valves (gate, flap, ball, flush valves etc.) & station, Pipe supports, hangers, fixing, plumbing for small houses direct and indirect water supply systems for individual and multistorey buildings, Fire hydrants, solar heating systems. Preparation of plumbing **drawings**, **symbols** commonly used in these



drawings. **Drainage** – floor traps, drains, P, Q, S-trap, bottle traps, Single stack, two stack, cross venting, fixture venting, **Materials** for construction.

Sanitary appliances – Kitchen and toilets, etc., Basic requirements of Drainage and Sanitation, **Selection**, and **Installation** of Sanitary Appliances from Hot and Cold-Water system- **Pipe Sizes**, **Materials** and **type** of fixtures, Sanitary pipe work – PVC, GI, CI, HDPE, etc. within the premises and multi storied building. **Quantity Estimate** for Sanitary Fixtures.

UNIT III: Sanitation and Storm Water System

Basic **principles** of sanitation and disposal of various kinds of waste matter from building. Brief **description** of **various types** systems of sewage disposal systems - surface drainage combined and separate system of drainage, Individual disposal systems- cess pool, Septic tank etc., Public Drainage system, **Materials**, details of **Construction** etc., Refuse disposal: - Refuse bins, refuse chutes etc, **plumbing systems** (one pipe, two pipe etc), Anti siphonage and vent pipes, single stack and double stack system House drainage system, Drainage of sub-soil water. Manholes, Sub drains, culverts, ditches, and gutters, drop inlets and catch basins, roads and pavements, storm water overflow/regulators. **On-site processing** and disposal **methods**. Aerobic and Anaerobic decomposition, purifying capacity of water bodies. Sewage **treatment**- Biochemical Oxygen Demand.

Sources and **uses** of storm water, Roof drainage – Pitched roofs, flat roofs, Surface Water drainage, storm water drains. Rainwater harvesting **techniques**, Swales, ditches etc, **methods** of recharging ground water, **construction** details and techniques for **storage** of rain water for building and site use.

UNIT IV: Solid Waste Disposal

Types of solid waste, **quantity** of waste generated, **collection** and **segregation** of municipal solid waste. Recycling **techniques** for solid waste. **Properties** of Solid Wastes: Physical and chemical composition of municipal solid wastes, waste generation rates. **Management** of Solid Wastes in India: Prevalent SWM **practices and deficiencies**: **Storage** of waste at source, segregation of wastes, primary collection of waste, transportation of waste, disposal of wastes. **Disposal** of Wastes: Sanitary landfilling, Composting, Incineration, Pyrolysis – **advantages** and **limitations**.

UNIT V: Hygiene

Importance of Health- Individual and Building, set of **practices** performed for the preservation of health and well-being. World Health Organization (WHO) **guidelines**. Hygiene Cleanliness, Waterborne, Water-related, Water based, Epidemic **diseases**, Conservancy to water carriage system. Understanding the **Sustainable techniques** related to sanitation without compromising the hygiene at Individual and building level. Incorporating the aspects of hygiene for bathrooms, kitchens, and other areas where people engage in activities that require hygiene and clean conditions.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Venkateswara (V.V.N.)
Kandachad (M), R.R. Dist. 506 075, T.S.

There are also emerging areas of focus in architecture related to hygiene, such as designing buildings and spaces that can better resist the spread of diseases, such as those that have become more relevant in the context of the COVID-19 pandemic, etc.

ASSIGNMENTS TO BE FORMULATED:

1. Assigning work to learn about the BIS related to the topics.
2. Case Study- Understanding the Water Supply from Residential Level to Neighborhood level.
3. Market survey for pipes, fittings and fixtures, traps etc
4. Online Study on Water Supply, Sanitation and Hygiene – report submission.
5. Inculcate working drawings and report on Water supply and Sanitation with all fixtures in Kitchen, Bath, and Utility for a small Residence and multi storied i.e., Plan and Section, Terrace plan with Rainwater down take pipes, Sump and OHT. Report Writing - Understanding the present technologies and facilities.
6. Individual and group presentation on micro and macro (Environment) Problems and solutions associated with the health and well-being of the society.

Reference:

1. National Building Code (NBC) – 2005, 2016.
2. Wise, A.F.E. and Swaffield, J.A., “Water Sanitary Services for Buildings”, Longman Scientific and Technical, Harlow, 1995.
3. Greeno, Roger, “Building Services Technology and Design”, Longman Scientific and Technical, Harlow, 1997.
4. Chatterjee, A.K., “Water Supply and Sanitary Engineering”, Khanna Publishers, New Delhi, 1986.
5. Punmia, B. C., Jain, A. K. and Jain, A. K. (1995). Water Supply Engineering. New Delhi: Laxmi Publications.
6. Punmia, B. C., Jain, A. K. and Jain, A.K. (1998). Waste Water Engineering. New Delhi: Laxmi Publications
7. Rangwala, S. C. (2005). Water Supply and Sanitary Engineering. Charoter Publishing.
8. Birdie, G. S., and Birdie, J. S., Water Supply and Sanitary Engineering, Dhanpat Rai and Sons, New Delhi, 2007.
9. Garg, S. K., Environmental Engineering, Vol. II, Khanna Publications, New Delhi, 2009.
10. Duggal, K. N., Elements of Environmental Engineering, S Chand and Co. Ltd., New Delhi, 2008
11. Hussain, S.K. T.B. of Water supply and Sanitary Engineering, 3rd ed. Oxford and IBH Pub. Ltd., New Delhi, 1994



[Signature]
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Munaballi (M), R.R. Dist-500 075. T.S.

E-resources:

https://www.pas.org.in/Portal/document/ResourcesFiles/pdfs/Module_1%20Basics%20of%20water%20supply%20system.pdf	Basics Of Water Supply System Training Module for Local Water and Sanitation Management
https://ncert.nic.in/textbook/pdf/iepg105.pdf	Pipe Fittings, Joints, and Valves
https://law.resource.org/pub/in/bis/S03/is.sp.35.1987.pdf	Handbook On Water Supply and Drainage (With Special Emphasis on Plumbing)
https://iricen.gov.in/iricen/books_jquery/Plumbing%20And%20Pipe%20Line%20Work.pdf	Rets-Practical Guide Book Series- Plumbing and Pipeline Work
https://www.philadelphia.edu.jo/academics/nbadarneh/uploads/CH%202%20part2.pdf	Sanitary Systems Design Part 2 Prepared By: Eng. Nadia Badarneh
https://ec.europa.eu/echo/files/evaluation/watsan2005/annex_files/WEDC/es/ES07CD.pdf	Chapter 7-Solid Waste Management
http://www.mmmut.ac.in/News_content/21020tpnews_10312020.pdf	Madan Mohan Malaviya Univ. Of Technology, Gorakhpur Solid Waste Management
https://www.eawag.ch/fileadmin/Domain1/Abteilung/en/sandec/E-Learning/Moocs/Solid_Waste/W2/Solid_waste_management_UNEP_2005.pdf	Solid Waste Management
https://ec.europa.eu/programmes/erasmus-plus/project-result-content/908fceb3-6d8d-43a0-bc76-d780aeb1a13b/Hygiene-Sanitation-Handbook_ENG.pdf	Hygiene And Sanitation Handbook 2018
https://apps.who.int/iris/bitstream/handle/10665/330100/WHO-CED-PHE-WSH-19.149-eng.pdf	Water, Sanitation, Hygiene and Health A Primer for Health Professionals
https://www.jica.go.jp/project/solomon/002/materials/ku57pq00003um0e9-att/Water_Sanitation_and_Hygiene.pdf	Healthy Village Facilitator's Guide-Water Supply, Sanitation and Hygiene (Wash)

COURSE OUTCOMES:

On successful completion of the course, student should have capability to

COURSE OUTCOME	DESCRIPTION
CO1	Identify the importance of water supply, sanitation and hygiene in architecture and design.
CO 2	Evaluate different water supply and plumbing technologies, systems and interventions for buildings and communities
CO 3	Apply site planning and design principles for building water supply, sanitation and plumbing facilities and infrastructure in relation to water resources, sanitation, and hygiene requirements
CO 4	Design integrated solutions that promote health, safety, wellbeing at building and site level.
CO 5	Apply critical thinking, problem-solving, and project management skills to develop water supply, sanitation, and hygiene projects that align with local and global standards, regulations, and best practices



PRINCIPAL
J.B.R. Architecture College
 Bhaskar Nagar, Yenkapally (V),
 Minabadi (M), R.R. Dist-500 075, T.S.

These course outcomes ensure that students will not only acquire technical knowledge in

	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	
CO 1	2	-	1	-	1	-	2	1	1	-	-	1	1,3,5,7,8,9,12
CO 2	3	-	-	2	1	3	1	-	2	3	-	2	1,4,5,6,7,9,10,12
CO 3	2	-	-	-	3	3	2	2	2	1	2	-	1,5,6,7,8,9,10,11
CO 4	-	2	3	2	-	2	-	3	2	-	-	-	2,3,4,6,8,9
CO 5	1	3	2	-	1	2	-	-	3	-	3	1	1,2,3,5,6,9,11,12
1- Low Correlation 2-Medium Correlation 3-High Correlation													

water supply, sanitation and hygiene but also develop practical, creative, and ethical skills that are relevant to their professional practice as architects.



[Signature]
PRINCIPAL
J.B.R. Architecture College
 Plot No. 10, Venkappally (V),
 R. Dist. 596 075, T.S.

ID 1.3 Environmental Science for Interiors

- **Thermal Comfort:**

Importance of human comfort in interior spaces. Heat flow within buildings. Thermal properties of materials. Climate and material choices for interior spaces Human response to the thermal environment.

- **Lighting**

Lighting in interiors. Lighting levels & criteria. Natural & artificial lighting. Selection of lighting. Lighting devices available in the market and their characteristics. Economic issues. Fixture selection and placement – floor, table, desk, wall & ceiling units. Psychological impact on human moods & emotions.

- **Acoustics:**


Behavior of sound in enclosed spaces.

Understanding acoustics and its integration with interior design. Sound absorbents – porous materials, panel or membrane absorbers, resonators.

Absorption coefficient of various acoustical materials.

Human responses to the sensation of sound.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V)
J.B.R. Diet

FIRST SEMESTER

ED 1.1 ENVIRONMENTAL DESIGN STUDIO-I

L/s : 12/Wk Int : 150 End Exam : 150 Total : 300 End Exam : Viva – voice Cr : 12

Objective

To understand and analyze, climate and its elements at both micro and macro level and design projects of varied scales with passive strategies.

Course contents

Macro level

Climatic Design of Neighborhood which includes designing group of buildings, clusters with total understanding of interaction of Built Environment and ambient environment.

Application of site level strategies to create built mass to achieve positive influence on micro climate.

Micro level

Climatic design of unit with understanding of thermal behavior of walls, facade roof etc., and fenestration design.

Design demonstration shall necessarily include the optimization of shadow mask to harness the advantages of mutual shading and to understand the wind pattern generated.

A report to be prepared on the Thermal calculations and qualitative and quantitative passive cooling/heating techniques used .

Sessional/Term Work Design outcome for both projects will be assessed as per the project brief

References

1. G.K.Brown and Mark DeKay ; Sun, Wind and Light, John Wiley and Sons, INC
2. O.H.Koenigsberger; Manual of Tropical Housing & Building, University Press
3. Arvind Krishnan: Climate Responsive Architecture
4. Bansal. N; Passive building design, London
5. Givoni; Man, Climate and Architecture




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moirabad (M), R.R. Dist-500 075, T.S.

ED 1.2 ENERGY SIMULATIONS E.C.B.C – I

L/s : 6/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 06

ECBC objective Compliance and approach: Energy efficiency performance levels, building systems, precedence, building classifications, energy performance index, compliance approaches and requirements, approved analytical tools, administrative requirements, compliance documents, Benchmarking and Star Labelling.

Course Content

ECBC Building Envelope: Mandatory requirements-fenestration, opaque construction, day lighting, building envelope sealing, Prescriptive requirements-roof, opaque external walls, vertical fenestration, skylights.

Shading Equivalent Factor (SEF), Building Envelope trade-off method, Understanding refrigeration cycle, and overview of HVAC components - Pumps, Chiller, Piping, Ducting, Air Handling Units (AHU), Cooling tower, Packaged and Central HVAC systems, Comfort Systems and Controls: Mandatory requirements-ventilation, minimum space conditioning equipment efficiencies, controls, additional controls for ECBC + and super ECBC, additional controls for super ECBC buildings, piping and duct work, system balancing, condensers, service water heating, Prescriptive requirements-pumps, cooling towers, economisers, variable flow hydronic systems, boilers, energy recovery. Total system efficiency-alternate compliance approach. Low energy comfort systems. Lighting and Controls: Mandatory requirements-lighting controls.

Exit signs, Prescriptive requirements- interior lighting power, building area method, space function method, Installed interior lighting power, Exterior lighting power, Electrical and renewable systems.

Mandatory Requirements-Transformers, energy efficient motors, Diesel generators sets, check metering and monitoring, power factor correction, power distribution systems, uninterruptible power supply, renewable energy systems.

Whole building performance method -General, Scope, compliance, annual energy use, trade-off limited to building permit, documentation requirements, Mandatory requirements, Simulation requirements-energy simulation program, climate data, compliance calculations, Calculating energy consumption of proposed design and standard design-energy simulation model, HVAC systems, compliance thresholds for ECBC Compliant, ECBC+ and super ECBC Buildings, Maximum allowed EPI ratios, Schedules.

Practical Sessions

How simulation software works, geometry of buildings, Material and construction, Openings and shading, lighting and controls. Daylight Simulation, Heating and cooling design, Unitary HVAC Systems, Central HVAC System, Building energy code compliance, project: small office, Building energy code compliance, project large office.

References

1. Steven V Szokolay. Introduction to Architectural Science: The Basics of Sustainable

ED 1.4 RESOURCE MANAGEMENT AND ECOLOGY

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

Objective

Evaluation of Ecology, Man and Ecosphere, Components of nature and some basic concepts, process of ecology, flow of material, water, energy, invasion, succession, predictim, regulatory forces, adoption, tropic levels, food chain, food web, ecological pyramids.

Eco-system and their relevance to environment, causes and consequences. Impact of advance architectural methods, urbanization and industrialization on nature. Pollution: Types, sources, remedies.

Urban eco-system approach, evolution and significance .

Introduction to quantitative ecology:

Identification of ecological parameters for planning at different levels, site planning, settlement planning, regional planning.

Data needs, formats for data collection. Types of analyses required to evolve ecological parameters.

Environmentally compatible regional development ; An approach.

Ecological awareness in India; traditional, indigenous methods, contemporary trends.

Endowments and resources, definition and classification according to different criteria, renewable, non-renewable energy sources, etc.

Human welfare and development as functions of resurces in terms of physical environment, way of living and technology. Space bound and flow resources. Preparation and analysis of inventories and resource materials. Finiteness of resources, examples of transfer from one resources to another in history at different parts of the world, development, utilization and conservation of resources planning, integrated planning approach to resources development management, traditional and contemporary approaches to resource development in India, some selected case studies.

Physical Environment


Air Environment – Air resources, Atmospheric systems, climate, Emission standards, global warming, ozone depletion, nuclear wars, problems, Water Environment – Water resources – types, water resources- renewal, use, Drinking water standard, Health Aspects, water pollution, sanitation, disposal standards of Treated wastewater.

Soil environment – soil types, soil yield, soil pollution.

References

1. Ecology and natural resource management , William E Grant.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

ED 1.5 SUSTAINABLE DEVELOPMENT AND PLANNING

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

Objective

To introduce the scale of macro planning and its relationship with micro level planning (site planning). To develop an understanding to mitigate climate change issues at neighbourhood level and to expose to the steps involved in sustainable urban design projects.

To expose the students with the cross sectoral relationship between various components of urban planning, viz. transportation planning, land suitability analysis, infrastructure planning and socioeconomic planning. Introduce the concept of environmental planning and expose to the emerging concepts in sustainable planning like, smart city concept, eco-city concept, etc.

Course contents

Introduction to the theory of social planning and study various examples of socially inclusive planning projects, community participation in planning process, etc.

Study examples / case studies of social infrastructure planning (Chandigarh, Gandhinagar, Naya Raipur, Navi Mumbai, etc.) Principles of urban planning, classifications of human settlements (Indian context) and study national planning standards like UDPFI guidelines, Broad Theory of transportation planning and road network theory and principles,

Environmental policies and initiatives – national and international, Housing theory and policies in India, Theory and principles of sustainable planning, Issues and tools of


sustainable urban design and neighbourhood planning, Case study analysis of smart cities, eco-cities (national and international) , Formulating sustainable strategies for an existing city at macro level (city level) and at micro level (neighborhood level).

Group submission based on above exercise, Seminar / presentation of various aspects, issues of sustainable development (individual assignment).

References

1. Stephen Wheeler; *Planning for Sustainability*,
2. Simon Presner, *Principles for Sustainability*
3. Cecilia Tacoli; *Urban Linkages*
4. Monto & Ganesh; *Sustainability by human settlements*
5. Sampson; *The WTO and sustainable development*
6. *Achieving sustainable cities in SE Asia region*
7. Antonio Layards; *Planning for Sustainable future*
8. D Farr; *Sustainable Urbanism*
9. Tiffin J; *Transport communications*
10. Brain; *Transport in Cities*
11. K.Lynch; *The Image of the City*, MIT Press
12. Edington John; *Ecology and Environmental Planning*
13. Alexander Christopher; *A pattern Language The Environment ,Public Health and Human Ecology consideration for Economic Development.*




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

SECOND SEMESTER

ED 2.1 ENVIRONMENTAL DESIGN STUDIO-II

L/s : 12/Wk Int : 150 End Exam : 150 Total : 300 End Exam : Viva – voice Cr : 12

Objective

The purpose of this Studio is to engage students with environmental issues and concerns at urban scale (5 hectares) and context and apply the theoretical knowledge of these and sustainable design principles to specific projects affected by these issues.

Course contents

Urban Environmental Studies, Environmental Status Reporting and identification of environmental issues in urban areas. Conceptual design strategies for Sustainable Development of public realm at urban scale & context.etc.

These may include River front development, ecological restoration projects, sustainable urban blocks, Heritage conservation for sustainability, Sustainable City Development Strategies etc.


Sessional/Term Work

Identification of Environmental issues and areas of design intervention, presentation of concepts and design strategies for the same, technical drawing portfolio and a report to elaborate the sustainable design scheme.

References:

1. Kevin Lynch, Image of the City




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S

ED 2.2 ENERGY SIMULATIONS ECBC – II

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

Course Overview: This course will give understanding of advance concepts in building energy efficiency and how to model them.

Objective of the course: To enable students to design and evaluate high performance buildings leading to net zero building design. Understand advance electrical and mechanical systems and how to integrate them in design.

Expected Skills/Knowledge Transferred: Modeling and simulating various aspects of low energy building design.

Course Content:

Simulation in early design stage – Orientation, Window to Wall (WWR) ratio, Overhang and fins, Glass type, Overhang, Roof and wall insulation. Daylighting design and controls - Electro chromic glazing, Dynamic facades, Glare analysis and control, Annual solar exposure, Spatial daylight autonomy. Introduction to Heating Ventilation and Air Conditioning (HVAC) system selection, Concept of thermal storage, radiant cooling systems, and Under Floor Air Distribution (UFAD). Introduction to HVAC controls, Overview of Demand Control Ventilation (DCV), VAV Control, VFD controls on AHU, VFD control on pumps, Energy recovery controls, and Economiser controls. Interior lighting design and performance evaluation using steady state simulation, Exterior lighting design and performance evaluation. Designing for reducing light pollution and trespass. Natural ventilation and mixed mode ventilation Passive features – Earth air tunnel, Stack ventilation, Cool roof. Renewable energy systems, Sizing Photovoltaics and Wind energy systems. Advance simulation parameters, Weather data, Life Cycle Costing Analysis (LCCA).

Practical Sessions

Parametric simulation for envelop design optimization, Designing and evaluating daylighting strategies. Simulating mixed mode building. Designing and evaluating passive features. Simulation of interior and exterior lighting design. Designing roof top photovoltaic system. Design a Net Zero small office

References

1. Steven V Szokolay. Introduction to Architectural Science: The Basics of Sustainable Design. Architectural Press, Second Edition. 2010.
2. Vishal Garg, Jyothirmay Mathur, Surekha Tetali, Aviruch Bhatia. Building Energy Simulation: A workbook using DesignBuilder. CRC Press. 2017
3. Reddy T.A., et al. Heating and Cooling of Buildings: Principles and Practice of Energy Efficient Design, Third Edition, CRC Press
4. ISHRAE IEQ Standard. 2017




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

ED. 2.4 BUILDING ENERGY MANAGEMENT

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

Objective:

To introduce aspects of sources and supply of energy and its integration with planning and design of built environment ; global energy scenario, introducing the various types of renewable resources and appropriate technologies & harnessing strategies and policy of energy security and environmental protection.

Course contents

Energy Scenario: Current global scenario, Global Summits , Energy needs at global, country, state and city level. Identification of resources at country and state level .

Conventional Source – limitations; comparative advantages of Renewable resources.

Large scale production of renewable energies like Solar Energy /Wind Energy / Bio Mass.

Scope and potential of renewable resources, the technological limitations and application at general level and building integration level.

Other resources: Geothermal , Tidal , Mechanical Nuclear energy, Cogeneration.

Built form and energy , physical form and building geometry, Building Envelope, Fenestration, implication of urban built form on Energy.

Bio fuels

Alternative Fuels, CNG & LPG. Introduction to Energy Efficient HVAC Systems

Plumbing for Green Buildings. Energy Efficient Electrical Utilities,Electrical Energy basics, Electricity billing, Electrical load management and maximum demand control, Power factor improvement and its benefit.

Sessional/Term Work

Case studies on Energy management / Alternate sources of Energy, to be submitted and presented as seminar / discussions.

References


1. Energy and Urban Built Form ; Dean Hawkes,Janet Owens,Peter Rickaby, Philip Steadman.
2. VV Kishore ;Renewable energy, engineering and technology,TERI
3. Sophia and Stefen Behling; Solar Power
4. Martin Kalstchmitt; Renewable Energy
5. Ursula Eicher; Solar technology and buildings
6. Falk Antony; Photovoltaic for Professionals
7. Paul Gipe; Wind Power



Gayatri
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075. T.S.

8. Renewable energy and Environment, CEE Publication
9. Renewable energy technology development and implications, TERI
10. Sustainable building Manual, Vol 1 and 2, TERI
11. Turner and Doty; Energy Management Handbook.
12. Martin Greenwald; Residential energy systems and climate control technology.
13. Jan Kreider; Solar heating design.
14. Hegger and Fuchsen;. Energy Manual
15. Green awareness, Ferris State University.
16. R.K. Narang; Cleaner is cheaper, TERI




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075. T.S.

ED 2.5 ENVIRONMENTAL LAWS

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

Objective

The aim is to introduce the students to the international developments and trends in environmental laws and legislations in India.

Course contents

Public Health and Safety: Remedies under law of torts, law of crimes and other common law remedies.


The Constitution of India: Salient features, Fundamental Rights and Directive Principles of State Policy, Writ petitions, Public Interest Litigations. Environmental laws and legislations: Water Act, 1974, Air Act, 1981, Environment Protection Act, 1986, Energy Conservation Act, 2001, Public Liability Insurance Act, 1991 and Biodiversity Act 2002. Environmental Notifications and Rules: Coastal Regulation Zones, Examples of Eco-Fragile Area, Environment Impact Assessment of Development Projects, Eco-Sensitive Zones, Bio-Medical Waste (M&H) Rules, 1998, Hazardous Waste (M&H) Rules, 1989, Municipal Solid Waste (M&H) Rules, 2000.

International Practices-Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings, General status in , North America, Japan, New Zealand, Australia, Energy Codes in Singapore, Malaysia, Dubai and Middle east, ASHRAE 90.1, ASHRAE 90.2, IECC, Title 24.

References

1. Leela Krishnan; Environmental Law in India
2. Mehta M ; Commentary on water and air pollution with environmental protection law
3. Sarkar S; Legal aspects of regulations in South Asia
4. Chalifour N; Land use law for sustainable development
5. Birnie PW and Boyle; International law and the Environment
6. Saksena K.D ; Environmental policies and programs in India




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

ED 2.6 SUSTAINABLE SITE PLANNING AND LANDSCAPE DESIGN


L/s : 3/Wk Int : 100 Total : 100 End Exam : 3Hrs Cr : 03

Introduction to Sustainable Site Planning Principles. Climate and site planning, defining microclimatic presentation from macro climatic data, Analysis & integration of climatic data. Land as a resource – Geophysical, Hydrological, Built form, Potentialities/limitations, Principles of climate responsive Landscape Design. Application and techniques in using water as a resource for sustainable site planning and landscape, phyto-remedification of waste water. Case of shamshabad airport. Sustainable planning design and management. Advanced techniques in plantation, tree transplantation, tree banks, green houses, vertical green walls, terrace gardening techniques in urban areas, special plants to improve air quality and technological innovations. Sustainable landscape design approaches for water fronts in urban areas. Integrating soil into the design process. Soils in the site assessment, managing soil for sustainable site planning. Materials and resources, environment impact of materials and products, evaluating environmental and human health impacts of material, materials to minimize heat island.

References

1. The Sustainable Sites Handbook – Meg Calkins
2. The Living Landscape, Second Edition: An Ecological Approach to Landscape Planning
3. Site Planning and Design Handbook, Second Edition – Thomas H. Russ




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075. T.S.

THIRD SEMESTER

ED 3.1: ENVIRONMENT DESIGN LAB/STUDIO-III:

L/s : 12/Wk Int : 150 End Exam : 150 Total : 300 End Exam : Viva – voice Cr : 12

Objective

To develop creative skills, abilities, judgment and control in the design of built environment. The student should be able to have a comprehensive design approach to achieve energy efficiency in built environmental design.

Course contents

Design/Retrofitting of buildings/campuses for energy efficiency. Focus should be on buildings/campuses which are conventionally energy guzzlers.

To study and document, understand and analyze the energy consumption levels & patterns of any IT campuses, commercial complexes/malls, health campuses etc.

Sessional/Term Work

The student needs to prepare a detailed report on how to make the selected study area or campus ready for ratings, like Green certification, LEED etc.

Preparation of portfolio to apply the energy efficient principles & design inputs using appropriate technical software's eg. Grass hopper, Eco-tech etc to fulfill the requirements mentioned in the above prepared report.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

ED 3.2 ENVIRONMENTAL IMPACT ASSESSMENT

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 06

Introduction to Environmental Impact Assessment: Defining the role of impact assessment --- Rational for EIA --- Phases of impact assessment.

Impact Identification Techniques: Various methods used in impact identification --- detailed techniques of using these techniques --- strengths and weaknesses of the various techniques used as impact identification process.

Impact Evaluation Techniques: Techniques used in impact evaluation --- Weighting-Scaling techniques, ecological rating systems --- Goals-achievement matrix, priority-trade-off-scanning matrix.

Predicting Impact on the Physical Environment: Land --- indicators for land suitability and vulnerability --- Landscape characteristics and indicators of landscape process --- Mapping landscape characteristics --- Techniques for evaluating alternative land use plans.

Air --- calculating pollutant emission --- predicting ambient concentration --- predicting ecological response to air pollutant --- predicting human health risks.

Water --- categorisation of pollutants --- pollution dispersion --- water quality.

Predicting Impact on Biota: Ecosystem process and impact assessment --- energy fixation and flow.

References

1. ENVIRONMENTAL IMPACT ASSESSMENT : A Guide to Best Professional Practices, Charles H. Eccleston , March 29, 2017 by CRC Press.



Jayalaxmi J
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075. T.S.

ED 3.3 ENVIRONMENTAL RATING SYSTEMS

L/s : 6/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

Objective

To introduce the various tools and methods associated with the field of environment and to prepare students for new skills and upcoming trends in the field of environment.

Course contents

1. Energy Audit
2. Life Cycle Assessment
3. Carbon Footprint and Mapping
4. Green Building Rating Systems
5. GRIHA
6. LEED Ratings

* Any other Rating systems which are suitable.

Sessional/Term Work

Assignment will be in the form of notes/ assignments covering all the topics mentioned above with suitable examples, sketches and supportive material, case studies of Green certification buildings, leed certified buildings.

References

- GRIHA; Griha Manual, Vol 1 to 5, TERI Publication
- IGBC Manuals, CII Publication
- LEED Manuals
- ECBC Manual
- ECBC User Manual



Gujathu
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

ED 3.4. SUSTAINABLE PRACTICES IN WASTE MANAGEMENT

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

The primary goal is to provide a comprehensive understanding of waste management from an environmental public health perspective. Identify and discuss the public health, regulatory, planning, technical and economic principles that influence the solid waste management system. Describe appropriate methods to minimize the impact on the public's health from solid waste related activities.

Introduction, Segregation, Sorting, Composting, Vermi composting, Home composting, Recycling and Reuse. Incineration method, Scientific Land filling, Energy development and Management of urban waste services.

Develop a more informed opinion on a variety of waste related issues such as electronic waste, industrial waste, medical waste and C&D (construction and demolition) waste etc.

Sustainable techniques in municipal solid waste management.

Analysis of an integrated solid waste handling system including source reduction, recycling and reuse, composting, land filling and combustion by way of case-studies.

Solid waste disposal and management:

Resource recovery, technology options and determination of type and choice of systems as related to land use, density, economic levels and location of urban industrial and commercial activity areas.

Quantity of sewage, quantity of storm water, run off, time of concentration, design of sewers, flow diagrams, laying of sewers, sewer appurtenances. Design and layout of sewerage system.

Project Management (Need Assessment, Structure, MIS, Project Management Packages (Brief Introduction to MSPROJ/WINPROJ).

Reference Books:

1. Integrated Waste Management, A Sustainable Approach – Dave Whittaker.
2. Sustainable Solid Waste Management – Syeda Azeem Unnisa, S.Bhupathi Rav.
3. Advances in Solid and Hazardous Waste Management – S. Goel.
4. Municipal Solid Waste Management, Strategies and Technologies for Sustainable Solutions. - Christian Ludwig, Stefanie Hellweg, Samuel Stucki.
5. Sustainable Practices for Landfill Design and Operation – Debra Reinhart, Jon Powell, Pradeep Jain, Qiyong Xu, Thabet Tolaymat, Timothy. G.
6. DEWATS, Auroville.
7. Publications by Vastu Shilpa Foundation, Environmental Sanitation Institute, Ahmedabad.



[Signature]
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

ED 3.5 ENVIRONMENTAL INFRASTRUCTURE:

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

Objectives

This course is designed to provide a general understanding of various issues and approaches to planning, designing, and maintenance of Infrastructure. The major emphasis in this course will be on water supply, sewerage, storm water drainage, roads and soil water management.

Introduction:

Concepts of basic needs, formation of objectives and standards. Data requirements for programme planning of urban networks and service; feasibility planning studies for structure the infrastructure systems General Introduction to Infrastructure and its components and overview of the course contents.

Water Supply:

Planning water supply; resource analysis quality of water system design; technological choices of alternatives – Issues related to the choice of centralized city water supply versus decentralized systems.

Water demand (Context, Need Assessment and Planning requirements) - data to be collected, rate of demand, variations in rate of demand and effects of variations on design. Measurements of water qualities, forecasting demand. Conveyance and distribution system - General considerations, methods of distribution, service reservoirs, systems of supply, methods of lay out distribution pipes, wastage of water and permissible factors. Maintenance of distribution system. Filtration, disinfection, storage and distribution and their building complexes.

Sewerage and Storm Water Drains (Need Assessment in the context of Urbanisation, Planning Considerations and Norms, Basic Design Parameters and Appurtenances). Waste generation process in cities. Waste water disposal systems including storm water drainage, system designs, nodal facilities, technological and environmental considerations. Issues related to hydrological and geographical and development parameters – eutrophication. Biological concepts in environmental sanitation.

Sanitation technologies, their relevance to incremental growth of urban areas. Low cost sanitation technologies and concepts as related to Indian and third world country contexts

Sewage Treatment Plant and Water Treatment Plant (Components, Planning Considerations,

Basic Design Parameters).



[Signature]
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S.

Urban Roads (Planning Considerations, Road Categories, Design Parameters/Cross Sections, Transportation).

Other Infrastructure:

Concepts and theories for design and operation of electricity networks, power generation (conventional and non-conventional) communication networks like telephone facilities, WLL, cable TV, Fibre optic and other broadband communications networks, etc. Integrated Infrastructure Planning: Case studies in India.

References

1. Arora K.R, Irrigation, Water power & Water resource engineering, standard publishers distributors New Delhi.
2. G.S.Bridle, Water Supply & Sanitary Engineering.
3. V.S. Mahajan , Transport Planning, Policy & development.
4. Itpi reader volumes.
5. HSMI reports.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabadi (M), R.R. Dist-500 075, T.S

FOURTH SEMESTER
Environmental Design Project

ED 4.1 ENVIRONMENTAL ECONOMIC FEASIBILITY

L/s : 6/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 06

The objective of the course is to understand and relate the issue related to Economic & Feasibility of the project chosen in the thesis. The focus shall be on environmental aspects of the project.

Introduction to Project finance & Management. Project Management: Construction projects, Project development process, project management, main causes of project failure. . Project formulation: Generation and Screening of Project Ideas - Project identification – Preliminary Analysis, Market, Technical, Financial, Economic and Ecological - Pre-Feasibility Report and its Clearance, Project Estimates and Techno-Economic Feasibility Report, Detailed Project Report.

Project Planning Process: Plan development process, time planning process, work scheduling process, resource planning process, Importance of planning, scheduling and controlling projects.

Project Finance: Introduction to project finance, Means of financing, Costs associated with projects, estimates, Economic analysis of project, economic studies, sensitivity analysis. Cost estimating principles. Detailed estimates, cost concepts, classification of costs, elements of costs, Private sector participation in Infrastructure Development Projects - BOT, BOLT, BOOT Working Capital Management: Concept, Need and types of Working Capital; Determination of Working Capital; Estimation of Working Capital Needs; Financing of current assets – Matching, Conservative Approach, Aggressive Approach (Problem and Theory) .

Reference Books

1. Journal of Environmental Management Vol-88.Aug.2008
2. Chitkara, K.K, Construction Project management: Planning. Scheduling and Controlling. Tata McGraw-Hill Pub., New Delhi.1999. 8. Sharma, S.C, Construction Equipment and its Management, 4th ed. Khanna Pub., New Delhi, 2004.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), K.R. Dist-500 075. T.S.

ED 4.2 ENVIRONMENTAL DESIGN THESIS:

L/s : 24/Wk Int : 250 End Exam : 250 Total : 500 End Exam : Viva – voice Cr : 24

The students are individually required to identify the title for environmental design thesis leading to design demonstration as an end product.

The area chosen shall be multidisciplinary & addressing present or immediate future situations of the environment.

Appropriate methodology shall be identified by each student which will include literature reviews, case studies & Analysis, Primary & secondary surveys leading to synthesis of the Environmental design project.

Selection of Guide:

Students are suggested to consult internal faculty members based on their own areas of interest. It is also possible for students to consult external faculty actively participating in academic programme. Taking up academicians of other Institute/Research Organizations, as External Guide is permitted. However, in that case, a Core Faculty should be chosen as Internal Guide.




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Minabadi (M), R.R. Dist-500 075

Detailed appraisal/analysis of climatological performance of an existing residence and or a workplace; followed by redesigning or the same to improve climatological performance.

Reference books:

Koenigsberger, O.H. and Others. Manual of Tropical Housing and Building. Orient Longman, Chennai, 2003.

Konya, Allan. Design for Hot Climates.

Kukreja, C.P. Tropical Architecture. Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 1978.

Markus, T.A. and Morris. E.N. Buildings, Climate and Energy. Pitman Pub. Ltd., London, 1980.

Olgay and Olgay. Solar Control and Shading Devices.

GN17B2.2A VALUE EDUCATION

L/s: 2/Wk Int: 50 End Exam: Nil Total: 50 End Exam: Nil Cr:2

Course Overview: To provide guiding principles and tools for the development of the whole person, recognizing that the

individual is comprised of Physical, Intellectual, Emotional and Spiritual dimensions.

Knowledge Transfer /Expected Skills:

- To help individuals think about and reflect on different values.
- To deepen understanding, motivation and responsibility with regard to making personal and social choices and the practical implications in relation to themselves and others, the community and the world at large
- To inspire individuals to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening them.

Unit I

Value Education—Introduction – Definition of values – Why values? – Need for Inculcation of values – Object of Value Education – Sources of Values – Types of Values: i) Personal values ii) Social values iii) Professional values iv) Moral and spiritual values) Behavioral (common) values

Unit II

Personal values – Definition of person – Self-confidence – Relative and absolute confidence, being self-determined, swatantrata (loosely equivalent to freedom). Self-discipline – Self Assessment – Self-restraint –Self motivation – Determination – Ambition – Contentment

Self-respect and respect to others; expression of respect



Unit III

Social values – Units of Society - Individual, family, different groups – Community – Social consciousness – Equality and Brotherhood – Dialogue – Tolerance – Sharing – Honesty-Responsibility – Cooperation; Freedom – Repentance and Magnanimity.

Peer Pressure – Ragging - examples - making one's own choices

Unit IV

Professional values – Definition – Competence – Confidence – Devotion to duty –Efficiency – Accountability

– Respect for learning /learned – Willingness to learn-Open and balanced mind – Team spirit – Professional Ethics – Willingness for Discussion; Difference between understanding and assuming

Time Management: Issues of planning, as well as concentration (and aligning with self-goals)

Expectations from yourself. Excellence and competition, coping with stress, Identifying one's interests as well as strengths.

Unit V

Behavioral values – Individual values and group values. Anger: Investigation of reasons, watching one's own anger; Understanding anger as: a sign of power or helplessness, distinction between response and reaction.

Right utilization of physical facilities. Determining one's needs, needs of the self and of the body, cycle of nature.

Relationship with teachers. Inside the class, and outside the class, interacting with teachers.

Unit VI

Complimentary nature of skills and values. Distinction between information & knowledge

Goals: Short term goals and long term goals; How to set goals; How to handle responsibilities which have to be fulfilled while working for goals.

Reference Books

Ramancharla Pradeep Kumar. Compiled Reading Material IIIT Hyderabad

Dr. S. Ignacimuthu S. J., Values for life, Better yourself Books, Bandra Mumbai-600 050 (1999).

Values (Collection of Essays), Published by : Sri Ramakrishna Math., Chennai—4.,(1996)

Prof. R.P.Dhokalia., Eternal Human Values NCRT –Campus Sri Aurobindo Marg., New Delhi

5. **Swami Vivekananda.,** Education. Sri Ramakrishna Math., Chennai-4(1957)



GN22B3.1A: UNIVERSAL HUMAN VALUES

Periods per week			CREDITS	Marks			End Exam Type
L/T/S	P/F/O	Total		Internal	External	Total	W/J/S/P
1	2	3	3	50	50	100	J

Unit I

Introduction to Value Education (6 lectures and 3 tutorials for practice sessions)

- Lecture 1: Understanding Value Education
Lecture 2: Self-exploration as the Process for Value Education
Tutorial 1: Practice Session PS 1 Sharing about One-self
Lecture 3: Continuous Happiness and Prosperity– the Basic Human Aspirations
Lecture 4: Right Understanding, Relationship, and Physicality
Tutorial 2: Practice Session PS 2 Exploring Human Consciousness
Lecture 5: Happiness and Prosperity– Current Scenario
Lecture 6: Method to Fulfill the Basic Human Aspirations
Tutorial 3: Practice Session PS 3 Exploring Natural Acceptance

UNIT II

Harmony in the Human Being (6 lectures and 3 tutorials for practice sessions)

- Lecture 7: Understanding Human being as the Co-existence of the Self and the Body
Lecture 8: Distinguishing between the Needs of the Self and the Body
Tutorial 4: Practice Session PS 4 Exploring the difference of Needs of Self and Body
Lecture 9: The Body as an Instrument of the Self
Lecture 10: Understanding Harmony in the Self
Tutorial 5: Practice Session PS 5 Exploring Sources of Imagination in the Self
Lecture 11: Harmony of the Self with the Body
Lecture 12: Programme to ensure self-regulation and Health
Tutorial 6: Practice Session PS 6 Exploring Harmony of Self with the Body

UNIT III

Harmony in the Family and Society (6 lectures and 3 tutorials practice sessions)

- Lecture 13: Harmony in the Family –the Basic Unit of Human Interaction
Lecture 14: Values in Human-to-Human Relationship
Lecture 15: 'Trust' – the Foundational Value in Relationship
Tutorial 7: Practice Session PS 7 Exploring the Feeling of Trust
Lecture 16: 'Respect' –as the Right Evaluation



Gayatri J
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yamapally (V),
Moinabad, M.R.R. Dist-500 075, T.S.

- Tutorial 8: Practice Session PS 8 Exploring the Feeling of Respect
Lecture17: Understanding Harmony in the Society
Lecture18: Vision for the Universal Human Order
Tutorial 9: Practice Session PS9 Exploring Systems to fulfill Human Goal

UNIT IV

Harmony in the Nature/Existence (4 lectures and 2 tutorials practice sessions)

- Lecture19: Understanding Harmony in the Nature
Lecture 20: Interconnectedness, self-regulation, and Mutual Fulfillment among the Four Orders of Nature
Tutorial 10: Practice Session PS 10 Exploring the Four Orders of Nature
Lecture21: Realizing Existence as Co-existence at All Levels
Lecture22: The Holistic Perception of Harmony in Existence
Tutorial11: Practice Session PS 11 Exploring Co-existence in Existence

UNIT V

Implications of the Holistic Understanding – a Look at Professional Ethics (6lectures and 3 tutorials for practice session)

- Lecture23: Natural Acceptance of Human Values
Lecture24: Definitiveness of (Ethical)Human Conduct
Tutorial 12: Practice Session PS 12Exploring Ethical Human Conduct
Lecture 25: A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order
Lecture26: Competence in Professional Ethics
Tutorial 13: Practice Session PS 13 Exploring Humanistic Models in Education
Lecture 27: Holistic Technologies, Production Systems and Management Models -Typical Case Studies
Lecture28: Strategies for Transition towards Value-based Life and Profession




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenlapally (V),
Moinabud (V), R.R. Dist-500 075, T.S.

AR17B10.2C PROFESSIONAL PRACTICE & BUILDING CODES

L/s: 4/Wk Int: 50 End Exam: 50 Total: 100 End Exam: 3 hrs Cr:4

Course Overview:

The course provides overview and specific conditions of COA regulations, Architects Act 1972 in Architectural practice.

Objectives of the Course:

To impart awareness and technicalities of code of conduct, and the significance of Architects Act 1972 in Professional Practice.

Expected Skills / Knowledge Transferred: Legal, Technical and Financial aspects of Architectural practices and management skills for professional practice.

To develop understanding of the duties and liabilities of an architect along with knowledge of bye-laws that relate to the building and the environment in the Indian context.

Course Contents:

Unit - I

Professional Role of an Architect: Role and responsibility of architect in society; architectural profession as compared to others professions; difference between profession and business;

Architects approach to works; ways of getting works; types of works, works partly executed by other architect; various precautions to be taken before taking up the work; conditions of engagement between the architect and client; commencement of work.

Architect's Act 1972, registration of architect, COA, IIA and other organizations related to architectural profession. Professional Practice Regulations 1989 and Minimum Architectural Education Regulations under the Architect's Act. IIA Code professional conduct;

Unit - II

Architectural Services Rendered: Architect's duties; drawings to be prepared; Architects relation with other parties connected with works such as client, contractor, sub-contractors, consultants, municipal and public authorities.

Architectural services - conditions of agreement - scope of work, comprehensive architectural services and architectural competitions, remuneration, professional fees and charges as per IIA norms.

Architectural Competitions & Legislations

Regulations governing the conduct of competitions, open & closed competitions, appointment & duties of Assessors, instructions to participants, award of premium.

Units and mode of measurements - clerk of work and his duties; Inspection of



work during construction; certification of contractor's bills; bill of quantities; defects liability; Schedule of rates, tenders; public, limited and negotiated tender documents and allied formalities.

Unit – III

Tender and Contract: Calling for Tenders, tender documents, open & closed tenders, labour & demolition tenders, conditions of tender, submission, scrutiny, recommendations & award of contract.

Contracts; types of contracts such as item rate, lumpsum, cost plus percentage etc.

General principles of Indian Contract Act; Building contracts, conditions and forms of contract, study of standard contract of the Indian Institute of Architects. Articles of Agreement. Administration of contract.

Arbitration: Principle of Arbitration, Indian Arbitration act 1940, Powers and duties of arbitrators, revoking authority; umpire, award cost fixed fee, cost with penalty, labour day work, piece work daily

Easements: definition; various types of easements; Dominant, and servient owners; essential conditions for enjoyment of easement; Fire insurance's definition, cover note; insurance for new work and additions; insurable value of property, claim for damage due to fire. Insurance of completed and occupied building

Unit - IV

Preliminary knowledge of transfer of property Act; registration, stamp duty under registration and Govt. Power. Income tax, wealth, land acquisition Acts; general information about land acquisition procedures.

Accidents during progress of work and after completion, damage to persons and properties affected; Workmen's Compensation Act with regards to the affected persons and properties.

Consumer Protection Act and related acts on architects

Unit - V

Types of Architectural firms: Architects' Offices Proprietorship firms & Partnership firms combined concerns; Comparison between partnership and Proprietorship firms. Staff structure; filing of records; correspondence and drawings; maintenance of accounts; presentations in meetings, recording minutes of meeting.

A small report to be prepared by each student after visiting an architect's office.

Role of consultants and Co-ordination between different consultants on a big project.

Unit VI

Valuation – purpose of valuation, types of valuation- terms: market value, book value, capital cost, capitalized cost, – salvage/scrap value- various methods of estimating the depreciation of building properties.-



sinking fund- land valuation- mortgage and lease- Annuity- definition; problems to calculate the value of the property by different methods.

Fixation of rent- out going- gross and net income – year's purchase- capital cost- standard rent- market rent –economical Rent.

Unit VII

Building Codes (National Building Code, and Local Codes): Study of building byelaws to enable to design and prepare drawings for submission to concerned bodies and an understanding of the administrative processes for obtaining building permission.

General Land-use, building classifications and permissible uses; Norms for exterior and interior open spaces, Setbacks and margins, norms for building projections in open spaces, considerations in FAR, guidelines for open green areas.

Requirements for various parts of buildings, building height regulations, multi-storey regulations Requirements of parking spaces and vehicular movements, Nature of building codes in special regions like heritage zones, air funnels, environmentally sensitive zones, disaster prone regions, coastal zones, hilly areas, etc.

Norms for Fire Protection for various building classifications, norms for fire-exit ways and building materials, concept of fire zoning, doorways, stairways, passages and corridors, fire escapes etc.

Reference books:

Banerjee, D.N. Principles and Practice of Valuation, 5th ed. Eastern Law House, Calcutta, 1998.

Dalton, J. Patrick. Land Law, 4th ed. Pitman Pub., London, 1996.

Indian Institute of Architects. H.B. Professional Practice. The Architects Pub. Bombay.

Indian Standards Institution. National Building Code of India 1983. Indian Standards Institution, New Delhi, 1984.

Namavati, H. Roshan. Professional Practice, 8th ed. Lakshani Book Depot, Bombay, 2001.

Namavati, H. Roshan. Theory and Practice of Valuation, 2nd ed. Lakshani Book Depot, Bombay, 1991.

M. Dedbhkth Architectural practice in India by Prof.M.Deobhkta

V. SApte : Architectural Practice Procedures

Hyderabad Municipal Bye laws.

Indian Standards Institution. National Building Code of India 1983. Indian Standards Institution, New Delhi, 1984.

Scott, G. James. Architectural Building Codes, New York: Vanstrand Reinhold.



ED 2.5 ENVIRONMENTAL LAWS

L/s : 3/Wk Int : 50 End Exam : 50 Total : 100 End Exam : 3Hrs Cr : 03

Objective

The aim is to introduce the students to the international developments and trends in environmental laws and legislations in India.

Course contents

Public Health and Safety: Remedies under law of torts, law of crimes and other common law remedies.

The Constitution of India: Salient features, Fundamental Rights and Directive Principles of State Policy, Writ petitions, Public Interest Litigations. Environmental laws and legislations: Water Act, 1974, Air Act, 1981, Environment Protection Act, 1986, Energy Conservation Act, 2001, Public Liability Insurance Act, 1991 and Biodiversity Act 2002. Environmental Notifications and Rules: Costal Regulation Zones, Examples of Eco-Fragile Area, Environment Impact Assessment of Development Projects, Eco-Sensitive Zones, Bio-Medical Waste (M&H) Rules, 1998, Hazardous Waste (M&H) Rules, 1989, Municipal Solid Waste (M&H) Rules, 2000.

International Practices-Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings, General status in , North America, Japan, New Zealand, Australia, Energy Codes in Singapore, Malaysia, Dubai and Middle east, ASHRAE 90.1, ASHRAE 90.2, IECC, Title 24.

References

1. Leela Krishnan; Environmental Law in India
2. Mehta M ; Commentary on water and air pollution with environmental protection law
3. Sarkar S; Legal aspects of regulations in South Asia
4. Chalifour N; Land use law for sustainable development
5. Birnie PW and Boyle; International law and the Environment
6. Saksena K.D ; Environmental policies and programs in India



Gayatri
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yankapally (V),
Mombasa, M. R. Dist-500 075, T.S.

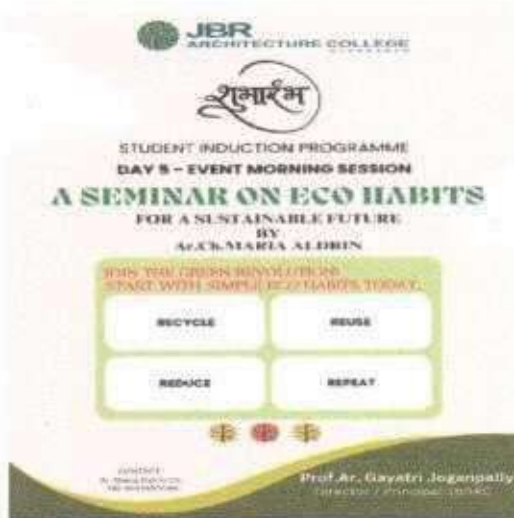
Extension activities promoting Environment & Sustainability



KALPAARANYA – Tree plantation drive at JBR Architecture College Campus




JBRAC part of SAVE SOIL Campaign



A seminar on Eco Habits




PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S



World Rivers Day : Musi River Front Walk

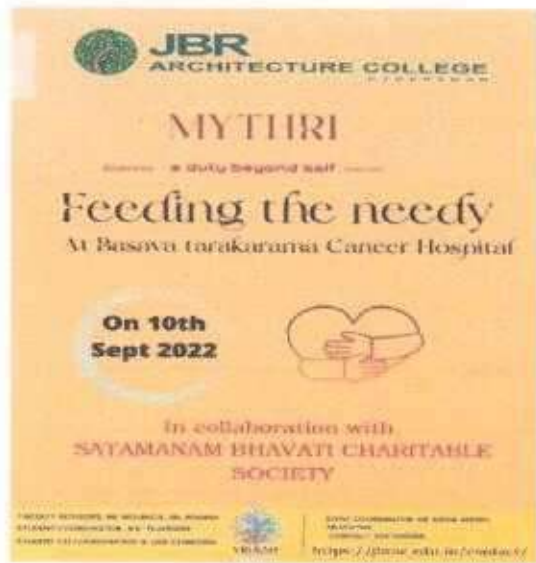


Plantation drive in the neighborhood village



Suyatri
PRINCIPAL
J.B.R. Architecture College
 Bhaskar Nagar, Yenkapally (V),
 Moinabad (M), R.R. Dist-500 075 T.S.

Extension activities promoting Human values:



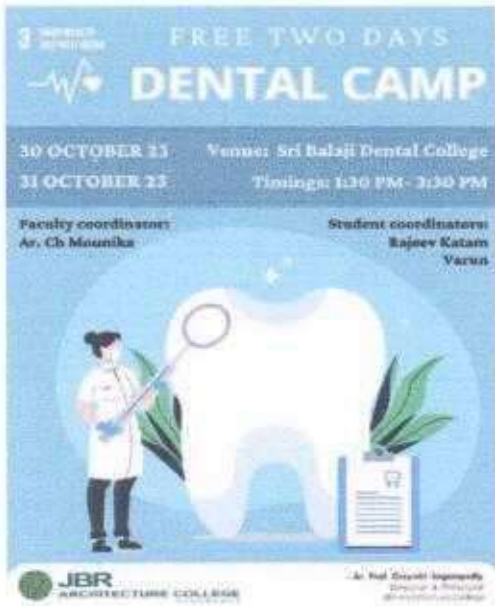
Feeding the needy at Basava Tarakam Cancer Hospital, Hyderabad by JBR Architecture College



Carnival of Love – Distribution of Mattresses, Rice, Dal, Buckets and Mugs to the needy by JBR Architecture College



[Handwritten Signature]
PRINCIPAL
J.B.R. Architecture College
Vasikerepally (V),
Dist-100 075



Dental Camp: JBR Architecture College



Blood Donation Camp: JBR Architecture College



Gayatri J
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist-500 075, T.S

Extension activities promoting Gender Equity



www.jbr.ac

Youth4Nation
राष्ट्रीय युवा

JBR
ARCHITECTURE COLLEGE

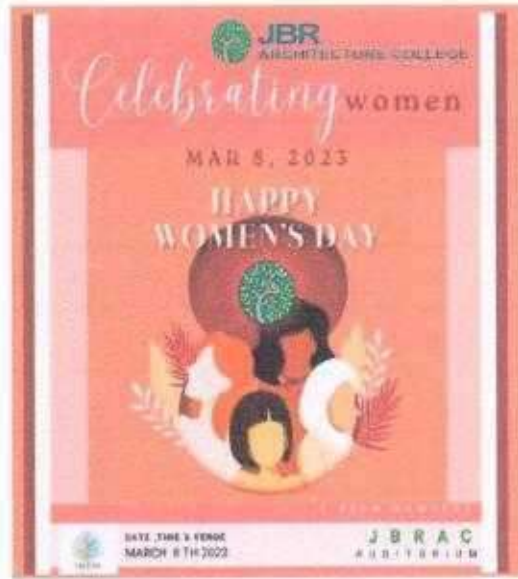
DISCOVERED LECTURE ON

'How youth can ignite the entrepreneurship to propel India into a developed country'

SPEAKER: CA, CMA, Mukesh Phalor

TIME: 30th July 2022 (Saturday), 2pm

VENUE: Auditorium, JBRAC, Hyderabad



JBR
ARCHITECTURE COLLEGE

Celebrating women

MAR 8, 2023

HAPPY
WOMEN'S DAY

DATE, TIME & VENUE
MARCH 8TH 2023

JBRAC
AUDITORIUM



Gayatri S
PRINCIPAL
J.B.R. Architecture College
Bhaskar Nagar, Yenkapally (V),
Malgajh (M), R.R. Dist-500 077