KBTCOE

Maratha Vidya Prasarak Samaj's

Karmaveer Adv. Baburao Ganpatrao Thakare College of Engineering

An Autonomous Institute affiliated to Savitribai Phule Pune University, Pune

Udoji Maratha Boarding Campus, Gangapur Road, Nashik - 422 013,

Maharashtra, India

Syllabus of Under-Graduate Program

Third Year B.Tech. Civil Engineering – Honors in Architecture and Town Planning (2024 Pattern)

(As per NEP 2020)

Academic Year 2026-27

(Copy for Student Circulation Only)

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Third Year B.Tech. Civil Engineering – Honors in Architecture and Town Planning
Curriculum Structure (2024 Pattern) Semester – V

Course Code	Course Type	Course Name	Teaching Scheme (Hrs/Week)			Evaluation Scheme and Marks					Credits			
			TH	PR	TU	CCE	ESE	TW	PR + OR	TOT	TH	PR	TU	TOT
105507	HON-1	Urban Housing and Infrastructure Development	3	2	-	40	60	25	25	150	3	1	-	4
Total			3	2	0	40	60	25	25	150	3	1	0	4

Third Year B.Tech. Civil Engineering – Honors in Architecture and Town Planning
Curriculum Structure (2024 Pattern) Semester – VI

Course Code	Course Type	Course Name	Teaching Scheme (Hrs/Week)			Evaluation Scheme and Marks					Credits			
			TH	PR	TU	CCE	ESE	TW	PR + OR	TOT	TH	PR	TU	TOT
105607	HON-2	Sustainable Design in Architecture and Landscapes	3	2	-	40	60	25	25	150	3	1	-	4
Total			3	2	0	40	60	25	25	150	3	1	0	4

Semester - V

Course Code: 105507		Course Name: Urban Housing and Infrastructure Development
Teaching Scheme	**Credit**	**Evaluation Scheme**
Theory : 3 Hours/Week **Practical :** 2 Hours/Week	**3** **1**	**CCE : 40 Marks** **ESE : 60 Marks** **TW : 25 Marks** **PR + OR : 25 Marks**

Expected Prerequisite Courses:

- Building Planning and Technology, Architectural Planning.

Course Objectives:

- To understand the concept, necessity, and significance of urban housing in sustainable urban growth.
- To investigate the planning and design principles of residential communities for various socioeconomic ranges.
- To examine slum and urban poor issues, as well as techniques for slum reform and rehabilitation.
- To understand urban infrastructure design and service integration, including water supply, sewerage, drainage, transportation, and solid waste management.

Course Outcomes:

After successful completion of the course, learner will be able to:

CO1: Explain the concepts of housing demand, housing needs, and residential area planning for different income groups, considering socio-economic and environmental factors.

CO2: Apply knowledge of slums and informal settlements to identify suitable housing and rehabilitation solutions for the urban poor.

CO3: Apply national housing policies, government schemes, housing finance institutions, and PPP models in housing development and demand estimation.

CO4: Implement principles of urban infrastructure planning using data, norms, and financial aspects for effective area allocation.

CO5: Apply strategies for effective urban service delivery, including water, sanitation, solid waste, and transportation systems.

Course Contents:

Unit-I: Planning of Residential Areas **08 Hours**

Concepts of housing demand and housing need, Housing requirement for different income groups, housing requirement for different sections of society, housing project layouts, socio-

economic, aesthetic and environmental factors affecting layouts.

Unit-II: Housing for Urban Poor **08 Hours**

Causes and characteristics of slums; problems of informal settlements; housing evaluation for the urban poor; standards, materials, social amenities and services; locational parameters; affordable housing schemes; slum improvement and rehabilitation.

Unit-III: Housing Policies and Housing Finance **08 Hours**

National housing policies, government housing schemes, role of housing boards- HUDCO, NHB, HFIs, housing finance systems and models, public-private partnerships in housing, housing demand estimation models.

Unit-IV: Urban Infrastructure Planning **08 Hours**

Types of urban infrastructure, infrastructure planning principles, data required for provision & planning of urban infrastructure, impact, norms and financial aspects, area allocation as per URDPFI.

Unit-V: Urban Services and Network Systems **08 Hours**

Overview urban services, classification of urban services and significance, water supply system, sewerage and drainage system, solid waste management, transportation and street lighting, telecommunication systems, health, education and social infrastructure, fire protection and recreation spaces.

Learning Resources:

Text Books:

1. Urban Development and Planning: An Introduction – Bikram Keshari Pattanaik.
2. Urban and Regional Planning: A Practical Guide – A. K. Jain.
3. Housing and Community Planning: Design, Construction and Infrastructure – A. K. Jain.

Reference Books:

1. Fredrick Gibberd:" Town Design", Architectural Press, London.
2. Charles Abrahms, "Housing in the Modern World", Faber and Faber, London.
3. D. Heggade and F. Cherunilam, "Housing in India", Himalya Publishing House, Bombay.
4. Dwivedi R. M. (2007), "Urban development and housing in India 1947-2007" New Century Publications, New Delhi.
5. UNHS Programme (2003): "The Challenge of Slums Global Report on Human Settlements 2003", UN-Habitat Earthsacn Publishing, London
6. Dr. D Goswami (2012): "Housing and Urban Poverty Alleviation", SAAD

Publications, Delhi

7. Fair, G.M., Gayer, J.C. and Okun, D.A., "Elements of water supply and Wastewater Disposal", John Wiley & Sons, New York.
8. National Institute of Urban Affairs, "status of water supply, sanitation and solid waste management in urban area" 2005. Development plan and DCP Rules of urban local body, New Delhi, Volume 1.

Web link for MOOC / NPTEL Links:

1. https://onlinecourses.nptel.ac.in/noc26_ar08/preview
2. https://onlinecourses.nptel.ac.in/noc26_ce48/preview
3. https://onlinecourses.swayam2.ac.in/e-learning/preview/imb26_mg24
4. https://onlinecourses.nptel.ac.in/noc26_mg53/preview

List of Practicals:

1. Prepare a housing layout plan for a small residential area for different income groups considering environmental and aesthetic factors on full empirical sheet also same on AutoCAD software.
2. Report on housing policies for urban poor in India.
3. Report on urban infrastructure standards using different norms such as URDPFI, NBC, and TCPO etc.
4. Prepare an infrastructure assessment report including water, drainage, roads, and solid waste systems.
5. Prepare a plan for integrated urban services for a residential area including street lighting, health, education, and recreational facilities.
6. Prepare studies to assess management, financial feasibility, Cost Benefit Analysis of Project, Social and Economic Impacts of residential and public projects.

Semester - VI

Course Code: 105607		Course Name: Sustainable Design in Architecture and Landscapes
Teaching Scheme	**Credit**	**Evaluation Scheme**
Theory : 3 Hours/Week **Practical :** 2 Hours/Week	**3** **1**	**CCE : 40 Marks** **ESE : 60 Marks** **TW : 25 Marks** **PR + OR : 25 Marks**

Expected Prerequisite Courses:

- Building Planning & Technology, Environmental studies, Integrated Urban Housing and Infrastructure Development.

Course Objectives:

- To understand the role of aesthetics, culture, and technological advancements in the evolution of planning of human settlements in India
- To introduce the concept, principles, and tools of sustainable development and develop understanding of environmental, economic, and ethical aspects related to sustainable urban planning.
- To develop knowledge of sustainable planning techniques, including ecological concepts, green buildings, eco-city development, and smart city planning approaches such as the Smart Cities Mission.
- To understand the principles and environmental factors involved in landscape planning, including geomorphology, hydrology, pedology, and landscape suitability assessment.
- To develop the ability to plan and design landscape development strategies for rural and urban areas and special environmental conditions such as industrial, coastal, desert, and water-logged regions.

Course Outcomes:

After successful completion of the course, learner will be able to:

CO1: Explain the influence of aesthetics, culture, and technological advancements on the planning of human settlements in India.

CO2: Describe the concept and principles of sustainable development, analyze current urban environmental problems, and understand sustainability frameworks.

CO3: Apply sustainable planning techniques by understanding ecological concepts, green building principles, eco-city development, green belts, and the role of planners and architects in sustainable urban development.

CO4: Analyze landscape planning principles by evaluating environmental factors such as

geomorphology, hydrology, pedology, and drainage systems, and apply landscape suitability assessment for effective environmental planning.

CO5: Design and plan landscape development strategies for rural and urban areas, including green roof design, environmental landscaping, and landscape treatments for special areas such as industrial zones, coastal regions, water-logged areas, and desert environments.

Course Contents:

Unit-I: Aesthetics, Culture and Planning Technology **08 Hours**

Overview of architectural aesthetics, cultural traditions, and technological developments in ancient India and their influence on settlement planning. Examination of planning concepts described in the Manasara and the urban planning characteristics of the Indus Valley Civilization. Analysis of aesthetic values, cultural transformations, and technological progress during the Mughal and British periods as well as in post-independence India, and their impact on the planning and development of human settlements.

Unit-II: Introduction to Sustainable Development **08 Hours**

Concept and meaning of sustainable development, its historical evolution, and present urban challenges associated with urban design. Theoretical foundations and principles of sustainability planning, including the three pillars of sustainability: environment, economy, and ethics, and ecological aspects of sustainable development. Study of planning tools, including sustainability indicators, ecological footprint analysis, and the virtual water concept. Preparation of sustainability strategies and major components of sustainable urban and regional development.

Unit-III: Sustainable Planning Techniques **08 Hours**

Fundamentals of ecology and ecosystem and their relevance in planning practices. Concepts of green buildings, sustainable residential clusters, and eco-city development. Planning approaches for the provision of green belts, environmentally compatible industrial locations, and conservation of existing water bodies. Role of architects and urban planners in promoting sustainable planning practices. Introduction to smart city concepts and sustainable urban infrastructure.

Unit-IV: Landscape Planning **08 Hours**

Behavioral and environmental considerations in landscape design. Principles and elements of landscape planning including geomorphology, hydrology, pedology, and drainage systems. Study of different types of landscaping and methods of landscape assessment. Techniques of landscape suitability analysis and evaluation of environmental factors influencing landscape planning.

Unit-V: Landscape Design and Development 08 Hours

Historical development and philosophical basis of landscape architecture. Objectives and environmental significance of landscaping. Factors affecting landscape design and its ecological impacts. Methods for planning landscape areas, including green roof systems. Landscape development strategies for rural and urban areas. Landscape treatment approaches for special conditions such as highly industrialized zones, waterlogged areas, desert regions, and coastal environments. Improvement of landscaping along existing transportation corridors and roads.

Learning Resources:

Text Books:

1. Cities of tomorrow: an intellectual history of urban planning and design in the twentieth century, Hall, P., Blackwell, London.
2. Making the Invisible Visible: A Multicultural Planning History, Sandercock, L., University of California Press, London.
3. Urban and Regional Planning: A systems approach, McLoughlin, J. B., Faber and Faber, London.
4. Textbook of Town Planning, G. K. Bandyopadhyay.
5. Town Planning by Rangwala.
6. Rehana Tariq; Sustainable Urbanization and urban Development, New Academic Publishers, New Delhi, 2008.
7. Guidelines on Landscaping and Tree Plantation: Indian Road Congress 2009.

Reference Books:

1. Joshua Zeunert, Landscape Architecture And Environmental Sustainability: Creating Positive Change Through Design, Bloomsbury Publication.
2. Rachel Cooper; Designing Sustainable Cities, Wiley-Blackwell Publisher, New Delhi, 2009
3. Cliff Moughtin, “Urban Design--Street and Square”, Third Edition, Architectural Press, Oxford 2003.
4. Douglas Farr, John Wiley & Sons , “Sustainable Urbanism: Urban Design with Nature”.
5. Umberto Berardi, Sustainable Construction: Green Building Design and Delivery, Taylor Francis publication.

Web link for MOOC / NPTEL Links:

1. https://nptel.ac.in/courses/105105162?utm

List of Practicals: (1-5 are compulsory & any two from 6-10)

1. Prepare a case study report on planning principles of the Indus Valley Civilization cities, such as Mohenjo-daro or Harappa, including street planning, drainage system, housing pattern, public buildings & planning technology.

2. Study of Ancient Indian Planning text- Prepare a short report explaining the planning principles described in the Manasara with diagrams showing settlement layout and building orientation.
3. Sustainable development case study- Select any modern sustainable city project & analyze environmental sustainability, economic sustainability, social equity & urban problems & solutions.
4. Sustainable planning techniques: Prepare a technical report on green buildings, including the concept of green building, green materials, energy efficiency techniques & water conservation methods.
5. Smart city study: Study any city selected under the smart city mission & prepare a report covering Smart infrastructure, smart governance, smart environment & smart mobility.
6. Landscape planning analysis: Prepare a landscape suitability analysis for a selected site, considering topography, soil characteristics, drainage, hydrology & vegetation.
7. Landscape design proposal: Design a conceptual landscape plan for a residential colony or a public park, including planting scheme, pathways, open spaces & water features.
8. Special area landscape treatment: Prepare a report on landscaping strategies for special Environmental areas such as industrial areas, coastal areas, desert/sandy areas, and water-logged areas.
9. Green roof design: Develop a basic design proposal for a green roof system, including structural Layers, plant selection, water drainage & environmental benefits.
10. Roadside landscaping study: Conduct a field study of existing road landscaping in the city & analyze avenue plantation, median planting, environmental benefits & improvement suggestions.