



3170628 INFRASTRUCTURE FOR SMART CITIES

SEMESTER: 7



CIVIL ENGINEERING DEPARTMENT

GOVERNMENT ENGINEERING COLLEGE - DAHOD

Academic Year: 2024-25

:: VISION STATEMENT OF THE INSTITUTE ::

To be a value-based engineering institute to disseminate globally acceptable education and nurturing research, innovation and entrepreneurship.

:: MISSION STATEMENTS OF THE INSTITUTE ::

1. To provide quality education in the engineering disciplines through creative balance of academics and extracurricular programs.
2. To provide learning environment for innovation and entrepreneurship.
3. To disseminate ethical values, social values and sensitivity towards environmental issues.

:: VISION STATEMENT OF THE CIVIL ENGINEERING DEPARTMENT ::

To be a recognized department in the field of civil engineering education to produce professional civil engineers, innovators and entrepreneurs for the development of the society.

:: MISSION STATEMENTS OF THE CIVIL ENGINEERING DEPARTMENT ::

1. To provide quality education to civil engineering undergraduates through creative balance of academic, professional and extra-curricular activities.
2. To impart knowledge in the field of civil engineering for the development of infrastructure facilities with environmental concern for betterment of the society.

3. To contribute in the nation's development through innovative ideas in the field of civil engineering.

:: PROGRAM OUTCOMES (POs) ::

Program Outcomes (POs) as identified by National Board of Accreditation (NBA), India are the attributes that the students are expected to attain at the point of graduation. Following are the POs of B.E Civil Engineering program:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The Engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

:: PROGRAM SPECIFIC OUTCOMES (PSOs) ::

Program Specific Outcomes (PSOs) are what the graduates of a specific undergraduate engineering program should be able to do at the time of graduation.

Civil Engineering Graduates shall have

PSO 1: Ability to analyze, design and rehabilitate the infrastructural projects of civil engineering.

PSO 2: Ability to use advanced civil equipment, software, techniques and work seamlessly in teams.

PSO 3: Ability to apply gained knowledge to choose from the innovative career paths, to be an entrepreneur, and a zest for higher studies.

:: PROGRAMME EDUCATION OBJECTIVES (PEOs) ::

Program Educational Objectives (PEOs) describe the career and professional accomplishments that programs are preparing graduates to attain within a few years (3-5 years) of graduation.

Following are the PEOs of B.E Civil Engineering Program:

1. Establish themselves as civil engineering professionals in government, public and private sectors
2. Manage infrastructural and sanitary facilities
3. Solve real world problems environmental concerns to serve society
4. Adapt to changing trends in analysis and design of civil engineering structures.
5. To do testing, survey and planning of civil engineering structures using modern tools

:: COURSE OUTCOMES (COS) ::

Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course. These relate to the skills, knowledge, and behaviour that students acquire in their matriculation through the course.

PROGRAM NAME: B.E. CIVIL ENGINEERING		
COURSE NAME: 3170628 INFRASTRUCTURE FOR SMART CITIES		
SEMESTER: 7		A.Y 2022-23
		Weightage %
3170628.1	Understand the necessity of infrastructural development for smart cities.	20%
3170628.2	Identify components of infrastructure and Prepare infrastructure plan for smart city.	25%

3170628.3	Understand smart transport system for smart cities and its application	20%
3170628.4	Study of water resources systems for smart city and its application.	20%
3170628.5	Understand National and Global policies to implement for smart city development.	15%

DISTRIBUTION OF THEORY MARKS					
R Level	U Level	A Level	N Level	E Level	C Level
10%	45%	30%	5%	5%	5%

Legends: **R**: Remembrance; **U**: Understanding; **A**: Application; **N**: Analyze; **E**: Evaluate **C**: Create and above Levels (As per revised Bloom's Taxonomy)

:: TEACHING AND EXAMINATION SCHEME ::

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	00	00	100

ESE - END SEMESTER EXAMINATION, **PA** - PROGRESS ASSESSMENT,

List of Open Source Software/learning website:

- 1. Smart city government of India. <http://smartcities.gov.in>**
- 2. Reconceptualising Smart Cities: A Reference Framework for India
https://www.niti.gov.in/writereaddata/files/document_publication/CSTEP%20Report%20Smart%20Cities%20Framework.pdf**
- 3. Draft Concept Note on Smart City Scheme". Government of India - Ministry of Urban Development
[-martcitiesoftomorrow.com/wp-content/uploads/2014/09/CONCEPT_NOTE_3.12.2014_REVISIED_AND_LATEST_.pdf](http://martcitiesoftomorrow.com/wp-content/uploads/2014/09/CONCEPT_NOTE_3.12.2014_REVISIED_AND_LATEST_.pdf)**

:: INDEX ::

Sr. No.	Date	Title	Page No.	CO attained	Marks	Sign of Faculty with Date
1		Understand the necessity of infrastructural development for smart cities.		CO1		
2		Identify components of infrastructure and Prepare infrastructure plan for smart city.		CO2		
3		Understand smart transport system for smart cities and its application		CO3		
4		Study of water resources systems for smart city and its application		CO4		
5		Understand National and Global policies to implement for smart city development.		CO5		

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CIVIL ENGINEERING DEPARTMENT

BE- 7th SEMESTER

3170628 _INFRASTRUCTURE FOR SMART CITIES

Tutorial 01

CO- 1

All Batches

Understand the necessity of infrastructural development for smart cities. _Tutorial 1

- Ques. 1** What is smart city? Write different the objectives of smart cities?
- Ques. 2** Explain: (i) Smart Governance, (ii) Smart Mobility, (iii) Smart Living, (iv) Smart People, (v) Smart Environment.
- Ques. 3** Write the difference between a city and smart city. What are the factors required to become a smart city?
- Ques. 4** Explain different dimensions of smart city development.
- Ques. 5** Describe different types of infrastructure pillars for smart city.
- Ques. 6** What are the advantages of smart city?
- Ques. 7** Explain core infrastructure elements of smart city.
- Ques. 8** Write history of smart city in the world.
- Ques. 9** Give a brief history of smart city in India.
- Ques. 10** What are the smart city challenges and measures? Explain in brief.
- Ques. 11** Write in brief the progress of smart city projects in India.
- Ques. 12** Write short note in context to smart city/ infrastructure on: (i) GIFT City project, (ii) DMIC project, (iii) LAVASA First Fully Planned hill city, (iv) Chandigarh smart city, (iii) Gandhinagar smart city.
- Ques. 13** Write down and explain the framework for infrastructure need assessment.
- Ques. 14** What is the need to develop a smart city?
- Ques. 15** How smart city helps in sustainable development?

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Tutorial 02

CO- 2

All Batches

**Identify components of infrastructure and Prepare infrastructure plan for smart city.
_Tutorial 2**

- Ques. 1** Explain energy and ecology with reference to smart city.
- Ques. 2** Explain smart grid and its requirement in India?
- Ques. 3** What is solar smart city? Write the objectives of solar smart city?
- Ques. 4** What are the issues and challenges for solar power plants in India? How to overcome the challenges?
- Ques. 5** What is affordable housing? Describe the criteria for housing in smart city.
- Ques. 6** What is green building? What are the objectives of green building?
- Ques. 7** List down and explain the features of green building. Write about the different benefits of green building.
- Ques. 8** Explain different technology advancement required for the safety and security in smart city.
- Ques. 9** What are the challenges for safety in smart city?
- Ques. 10** What is cyber security? Explain different types of cyber threats.
- Ques. 11** Write a note on disaster management in smart city. What are the different phases of disaster management cycle?
- Ques. 12** Explain early warning system (EWS). List out different agencies with their areas for monitoring and early warning in India.
- Ques. 13** What are the different economy indicators for smart economy?
- Ques. 14** Describe various phases of smart city project management.
- Ques. 15** Draw and explain a programme breakdown structure for smart city.

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Tutorial 03

CO- 3

All Batches

Understand smart transport system for smart cities and its application_Tutorial 3

- Ques. 1** What is Intelligent Transportation System (ITS)? Write the advantages of ITS.
- Ques. 2** Explain working of ITS.
- Ques. 3** What are the different types of ITS? Explain in brief.
- Ques. 4** Define the concept of smart vehicles. What are the features of smart cars?
- Ques. 5** Write in brief about fuels for future.
- Ques. 6** Write about the application of GIS in transportation.
- Ques. 7** Write about the application of GPS in transportation.
- Ques. 8** Explain navigation systems in India.
- Ques. 9** Discuss importance of traffic safety management.
- Ques. 10** Explain the approach for road safety management.
- Ques. 11** Give your views on road safety policies. Explain National road safety policy 2010 in brief.
- Ques. 12** Explain the concept of E-ticketing. Write its advantages and disadvantages.
- Ques. 13** What is smart mobility and how it can be improved?
- Ques. 14** Give recommendations for infrastructure improvement and vehicle technology for traffic safety.
- Ques. 15** List out various smart transport system for smart cities.

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Tutorial 04

CO- 4

All Batches

Study of water resources systems for smart city and its application._Tutorial 4

- Ques. 1** What do you mean by smart water management (SWM)?
- Ques. 2** What are the drawbacks of existing water system? Give some suggestions to improve existing water conveyance system.
- Ques. 3** Write about the IOT based smart wastewater management system.
- Ques. 4** What are the issues and challenges with existing urban sanitation system?
- Ques. 5** Write a note on water-meters.
- Ques. 6** Explain water smart city (WSC) concept.
- Ques. 7** Describe the water smart city approach and solutions.
- Ques. 8** Write short note on rain water harvesting. Write its need and advantages.
- Ques. 9** Explain the free flow and pressurized water conveyance system.
- Ques. 10** Explain the principles of sustainable urban water management.
- Ques. 11** Describe innovative sanitation solutions for smart cities.
- Ques. 12** Explain integrated flood management system.
- Ques. 13** Describe flood forecasting and warning systems in India.
- Ques. 14** Write a note on water resources conservation.
- Ques. 15** Describe various flood mitigation measures.

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Tutorial 05

CO- 5

All Batches

Understand National and Global policies to implement for smart city development

- Ques. 1** What is integrated infrastructure management? What is the need for IIMS for smart city?
- Ques. 2** Write worldwide policies for smart cities.
- Ques. 3** Explain the mission statement for smart city-India.
- Ques. 4** What is smart city challenge?
- Ques. 5** What is the procedure for selection of smart city in India?
- Ques. 6** Write targets laid down by government of India for development of smart cities in India.
- Ques. 7** Write a case study of smart city with SWOT analysis for Dehradun.
- Ques. 8** Write a case study of smart city with SWOT analysis for Nagpur.
- Ques. 9** Write a case study of smart city with SWOT analysis for Ahmedabad.
- Ques. 10** What is pan city project?
- Ques. 11** Explain the use of GIS in site selection for major infrastructure in smart city projects.
- Ques. 12** Prepare report on “Application of GIS technology for major facility identification and representation for Ahmedabad city or any smart city”. Use freely available data on various websites like Bhuvan, USGS, Diva GIS, etc.