



3140609 Civil Engineering - Societal & Global Impact

SEMESTER: 4



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: 3140609 Civil Engineering - Societal & Global Impact		
SEMESTER: 4	A.Y 2021-22	Weightage %
3140609.1	Outline the role of Civil engineering in evolution and revolution of mankind and globally present status of development in India.	10%
3140609.2	Estimate the level of resource utilization for present and future infrastructural projects using various tools/methods	10%
3140609.3	Infer the necessity of different conventional as well as futuristic infrastructural projects.	30%
3140609.4	Incorporate the goal of sustainable development to minimize the potential impacts on the global environment.	20%

3140609.5	Associate various measures for enhancing the build environment, thereby improving quality of life of the occupants.	20%
3140609.6	Evaluate the potential of Civil Engineering for employment creation and its contribution to the GDP.	10%

DISTRIBUTION OF THEORY MARKS					
R Level	U Level	A Level	N Level	E Level	C Level
20%	30%	30%	20%	0%	0%

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 Viva (V)	PA (I)	
2	0	0	2	70	30	0	0	100

ESE - END SEMESTER EXAMINATION, **PA** - PROGRESS ASSESSMENT, **ALA** - ACTIVE LEARNING ASSIGNMENTS, **OEP** - OPEN ENDED PROBLEM

:: LABORATORY / TUTORIAL PLANNING ::

COURSE NAME: 3140609 Civil Engineering - Societal & Global Impact

Semester:4

Faculty Member: Prof J.N.Bhojawala Prof C.S.Modhiya

Sr. No.	Content	Topic Name	Planning Date	Actual Date	Total Hours
1	Tutorial 1	Outline the role of Civil engineering in evolution and revolution of mankind and globally present status of development in India.			
2	Tutorial 2	Estimate the level of resource utilization for present and future infrastructural projects using various tools/methods			
3	Tutorial 3	Infer the necessity of different conventional as well as futuristic infrastructural projects.			
4	Tutorial 4	Incorporate the goal of sustainable development to minimize the potential impacts on the global environment.			
5	Tutorial 5	Associate various measures for enhancing the build environment, thereby improving quality of life of the occupants.			
6	Tutorial 6	Evaluate the potential of Civil Engineering for employment creation and its contribution to the GDP.			

:: REFERENCE BOOKS ::

Reference Books:

1. Žiga Turk (2014), Global Challenges and the Role of Civil Engineering, Chapter 3 in: Fischinger M. (eds) Performance-Based Seismic Engineering: Vision for an Earthquake Resilient Society. Geotechnical, Geological and Earthquake Engineering, Vol. 32. Springer, Dordrecht
2. Brito, Ciampi, Vasconcelos, Amarol, Barros (2013) Engineering impacting Social, Economical and Working Environment, 120th ASCE Annual Conference and Exposition
3. NAE Grand Challenges for Engineering (2006), Engineering for the Developing World, The Bridge, Vol 34, No.2, Summer 2004.
4. Allen M. (2008) Cleansing the city. Ohio University Press. Athens Ohio.
5. Ashley R., Stovin V., Moore S., Hurley L., Lewis L., Saul A. (2010). London Tideway Tunnels Programme – Thames Tunnel Project Needs Report – Potential source control and SUDS applications: Land use and retrofit options
6. <http://www.thamestunnelconsultation.co.uk/consultation-documents.aspx>
7. Ashley R M., Nowell R., Gersonius B., Walker L. (2011). Surface Water Management and Urban Green Infrastructure. Review of Current Knowledge. Foundation for Water Research FR/R0014
8. Barry M. (2003) Corporate social responsibility – unworkable paradox or sustainable paradigm? Proc ICE Engineering Sustainability 156. Sept Issue ES3 paper 13550. P 129-130
9. Blackmore J M., Plant R A J. (2008). Risk and resilience to enhance sustainability with application to urban water systems. J. Water Resources Planning and Management. ASCE. Vol. 134, No. 3, May.
10. Bogle D. (2010) UK's engineering Council guidance on sustainability. Proc ICE Engineering Sustainability 163. June Issue ES2 p61-63
11. Brown R R., Ashley R M., Farrelly M. (2011). Political and Professional Agency Entrapment: An Agenda for Urban Water Research. Water Resources Management. Vol. 23, No.4. European Water Resources Association (EWRA) ISSN 0920-4741.

12. Brugnach M., Dewulf A., Pahl-Wostl C., Taillieu T. (2008) Toward a relational concept of uncertainty: about knowing too little, knowing too differently and accepting not to know. Ecology and Society 13 (2): 30
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14. Cavill S., Sohail M. (2003) Accountability in the provision of urban services. Proc. ICE. Municipal Engineer 156. Issue ME4 paper 13445, p235-244.
15. Centre for Water Sensitive Cities (2012) Blueprint for a water sensitive city. Monash University.
16. Charles J A. (2009) Robert Rawlinson and the UK public health revolution. Proc ICE Eng History and Heritage. 162 Nov. Issue EH4. p 199-206

:: INDEX ::

Sr. No.	Date	Title	Page No.	CO attained	Marks	Sign of Faculty with Date
1		Outline the role of Civil engineering in evolution and revolution of mankind and globally present status of development in India.		CO1		
2		Estimate the level of resource utilization for present and future infrastructural projects using various tools/methods		CO2		
3		Infer the necessity of different conventional as well as futuristic infrastructural projects.		CO3		

4		Incorporate the goal of sustainable development to minimize the potential impacts on the global environment.		CO4		
5		Associate various measures for enhancing the build environment, thereby improving quality of life of the occupants.		CO5		
6		Evaluate the potential of Civil Engineering for employment creation and its contribution to the GDP.		CO6		

GOVERNMENT ENGINEERING COLLEGE, DAHOD
CIVIL ENGINEERING DEPARTMENT
BE- 4th SEMESTER

3140609 _Civil Engineering - Societal & Global Impact

APRIL 2023

Tutorial 01

CO- 1

All Batches

Outline the role of Civil engineering in evolution and revolution of mankind and globally present status of development in India.

1. Describe the importance of civil engineering in shaping the world
2. Explain various global trends and their impacts on construction
3. Describe any three ancient civil engineering Marvels and wonders
4. Describe any three modern civil engineering Marvels and wonders
5. List out and describe civil engineering Marvels of India
6. Write a note on future vision for civil engineering in India
7. What is pre industrial society what are these features describe pre industrial society in India
8. Write a brief note on agriculture revolution in India
9. Write a brief note on green revolution in India
10. Describe Industrial revolution in the world
11. Explain historical development of industrial revolution in India
12. Describe IT revolution in India

Rubric wise marks obtained:

Rubrics	Technical content	Understanding	Hand writing and cleanliness	Punctuality	Total
Marks					

**GOVERNMENT ENGINEERING COLLEGE, DAHOD
CIVIL ENGINEERING DEPARTMENT**

BE- 4th SEMESTER

3140609 _Civil Engineering - Societal & Global Impact

APRIL 2023

Tutorial 02

CO- 2

All Batch

Estimate the level of resource utilization for present and future infrastructural projects using various tools/methods

1. Describe recent major civil engineering breakthroughs and innovations
2. Write a short note on 3D printing
3. Write short note on building information modelling
4. Describe automation in construction give its advantages and disadvantages
5. What is GIS ?Explain in Detail
6. What are Objectives and applications of GIS
7. Explain various ecosystems in nature what are threats to ecosystems
8. What are pillars of sustainability what are causes of erosion of sustainability
9. What is global warming what are its causes and effects
10. What is HDI give its importance and how it is calculated
11. What is ecological footprint compare ecological footprints of various Nations

Rubric wise marks obtained:

Rubrics	Technical content	Understanding	Hand writing and cleanliness	Punctuality	Total
Marks					

GOVERNMENT ENGINEERING COLLEGE, DAHOD
CIVIL ENGINEERING DEPARTMENT
BE- 4th SEMESTER

3140609 _Civil Engineering - Societal & Global Impact

APRIL 2023

Tutorial 03

CO- 3

All Batch

Infer the necessity of different conventional as well as futuristic infrastructural projects.

1. What is Infrastructure give its importance
2. Discuss the impact of infrastructure of facilities on development of nation
3. Describe infrastructure habitats also explain habitat fragmentation and habitat connectivity
4. What are challenges to megacities
5. Explain the concept of smart cities what are the requirements of smart cities
6. Describe features of smart cities
7. Describe impact of smart cities on Indian infrastructure
8. Innovations that will revolutionize transportation transportation in near future
9. Write a short note on smart future roads
10. Write short note on future railways
11. Write short note on hyperloops
12. What is your vision for future airports
13. Describe your vision for future sea ports and canals
14. Write a short note on Panama canal and Suez canal
15. What are improvements in technology of underground tunnel construction
16. Write short note on submerge floating tunnel

Rubric wise marks obtained:

Rubrics	Technical content	Understanding	Hand writing and cleanliness	Punctuality	Total
Marks					

GOVERNMENT ENGINEERING COLLEGE, DAHOD
CIVIL ENGINEERING DEPARTMENT
BE- 4th SEMESTER

3140609 _Civil Engineering - Societal & Global Impact

MAY 2023

Tutorial 04

CO- 4

All Batch

Incorporate the goal of sustainable development to minimize the potential impacts on the global environment.

1. Enlist futuristic energy sources and describe hydro power
2. What is photovoltaics what are its applications
3. Write a short note on solar chimney
4. What is present status and future prospects of wind power in India
5. What is scope of generation of tidal energy in India give the advantages and disadvantages of tidal energy
6. What is geothermal energy what is Indian scenario on geothermal energy give advantages and disadvantages of geothermal energy
7. Write short note on thermal energy
8. Describe Indian government initiative for water conservation
9. Describe various Water conservation strategies
10. Write Short note on watershed management
11. Write short note on rainwater harvesting
12. Discuss telecommunication needs in India in future
13. Discuss codes and standards governing infrastructure development
14. Describe various methodologies for ensuring sustainability in construction

15. What is solid waste management what are its objectives
16. List out Traditional methods of solid waste disposal and explain sanitary landfilling
17. Describe Solid waste management by composting
18. Explain disposal of solid waste pyrolysis
19. Describe future methods of solid waste management
20. Write short note on smart ways technology
21. Discuss Conventional methods of water purification
22. Discuss futuristic methods of water purification
23. Describe hazardous waste treatment technology
24. What is hazardous waste give examples explain disposal of hazardous waste
25. Describe dams canals and river linking as flood control measures
26. What are merits and demerits of multipurpose river valley project
27. Enlist major air pollutants with their sources and effects
28. Describe mitigation measures for air pollution from both the sources
29. Explain global warming phenomenon what are its effects suggest controlling measures
30. Describe environmental metrics and monitoring
31. Discuss innovative techniques for ensuring environmental sustainability

Rubric wise marks obtained:

Rubrics	Technical content	Understanding	Hand writing and cleanliness	Punctuality	Total
Marks					

GOVERNMENT ENGINEERING COLLEGE, DAHOD
CIVIL ENGINEERING DEPARTMENT
BE- 4th SEMESTER

3140609 _Civil Engineering - Societal & Global Impact

MAY 2023

Tutorial 05

CO- 5

All Batch

Associate various measures for enhancing the build environment, thereby improving quality of life of the occupants.

1. Define built environment describe components of built environment
2. Write short note on facilities of built environment
3. What is computer aided facilities management give features and benefits
4. Explain measures for climate control in built environment
5. Describe methods for achieving energy efficiency in building
6. Write short note on LEED rating system for green building
7. Write a short note on recycling of materials
8. Write short note on cavity wall for thermal insulation
9. Explain various methods of temperature control in buildings and explain passive control method
10. listout various security and safety systems in building and explain any two
11. What do you mean by smart building explain four main operating areas of smart building
12. Enlist various systems of smart buildings and give its benefits
13. Describe role of Delhi urban arts commission
14. Define repair restoration and retro fitting
15. Describe methodology for the repair of structures
16. Write short note on conservation of Heritage structures

Rubric wise marks obtained:

Rubrics	Technical content	Understanding	Hand writing and cleanliness	Punctuality	Total
Marks					

GOVERNMENT ENGINEERING COLLEGE, DAHOD
CIVIL ENGINEERING DEPARTMENT
BE- 4th SEMESTER

3140609 _Civil Engineering - Societal & Global Impact

MAY 2023

Tutorial 06

CO- 6

All Batch

Evaluate the potential of Civil Engineering for employment creation and its contribution to the GDP..

1. Enlist various civil engineering projects
2. Write a note on financial planning of the project
3. Discuss briefly with the help of necessary charts project management
4. What is EIA the purposes of EIA.
5. Give various measures for waste avoidance and reduction in construction
6. Describe management tools for improvement of productivity in construction
7. Write a note on improvement of efficiency of construction equipments
8. Explain methods for reduction of greenhouse gases in civil engineering projects
9. Discuss new project management paradigms
10. Give benefits of lean concrete
11. Discuss future trends in project management
12. Discuss contribution of civil engineering to GDP in India
13. Describe health and safety aspects for stakeholders in construction
14. Discuss sustainability during project management
15. Download Research paper and summarise in your own words a literature review on the above related topic