



**Kadi Sarva Vishwavidyalaya's
LDRP Institute of Technology & Research
Gandhinagar-382 015**



**M.E. (Civil) Infrastructure Engineering Semester: III
Subject Name: Sustainable Water and Sanitation System (MECV303-B)**

A. Course Objective:

- To give an experience in the implementation of engineering concepts which are applied in field of environmental engineering.
- To provide a coherent development to the students for the courses in sector of engineering like Water and waste water system.
- To provide a coherent development in design sector.
- To analyze the water sources and water & waste water characteristics.
- To develop various water & waste water system.
- To present the foundations of many basic Engineering tools and concepts related Environmental Engineering.

B. Teaching /Examination Scheme :

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract/ Tut.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
03	00	00	03	03	03	70	30	20	00	120

C. Detailed Syllabus:

UNIT

DETAILED SYLLABUS

1. **Water Sustainability** and Parallels of Past and Present Civilizations With Respect to Water Utilization.
2. **Modern Water Practices:** Water treatment/sanitation in the demographic transitions of developed countries vs. the 3rd world; also Ecology and Economics.
3. **Modern Infrastructure for Water Treatment:** coagulation and softening; also a case study of Arizona – managing for sustainability.
4. **Sustainable sanitation:** suitable sanitation, sanitation management today and future, sanitation and public health, treatment, reuse and application.



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5. **Modern Infrastructure for Wastewater Treatment.**
6. **The priority list for water and wastewater treatment:** disinfection, disinfection, disinfection, but what about carcinogens and ecosystems. The water cycle: all water is recycled, even wastewater; also the water cycle and climate change effects.
7. **Water for the future:** Desalination and reuse and their limitations; If you solve energy limitations, you solve water limitations. Model for water supply and sanitation is more sustainable – privatization or government

D. Lesson Planning :

Sr. No.	Title of the Unit	Minimum Hours	Weightage (%)
1	Water Sustainability	03	5
2	Modern Water Practices	04	10
3	Modern Infrastructure for Water Treatment	14	10
4	Sustainable sanitation Treatment	14	45
5	Modern Infrastructure for Wastewater Treatment	04	10
6	The priorities for water and wastewater treatment	03	15
7	Water for the future	03	5
	Total:	45	100

E. Instructional method and pedagogy (Continuous Internal Assessment Scheme) (CIA) :

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures and practical which carries marks.
- At regular intervals assignments will be given. Students should submit all assignments during given period.
- Classroom participation and involvement in solving the problems in Tutorial rooms Carries Marks
- Internal exam of 30 marks will be conducted as a part of Mid semester evaluation.
- Experiments shall be performed in the field related to course contents.



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- The course includes a practical, where students have an opportunity to build an appreciation for the concept being taught in lectures.

F. Students Learning Outcomes:

- The students will gain an experience in the implementation of Transportation Engineering on engineering concepts which are applied in field Highway Engineering.
- The students will get a diverse knowledge of highway engineering practices applied to real life problems.
- The students will learn to understand the theoretical and practical aspects of highway engineering along with the design and management applications.

G. Recommended Study Materials

➤ **Reference Books:**

- Pathways to Sustainability book series by Adrian Ely, Adrian Smith, Patrick Van Zwanenberg, Gerald Bloom
- Water and Wastewater Treatment by Schroeder - McGraw Hill
- Water & Wastewater Engineering – II by Fiar, Geyer & Okun - John Wiley
- Standard Methods of Testing Water and Waste water Latest Edition Published jointly APHA, AWWWA, WPCF

➤ **Web Materials:**

- <http://www.epa.gov>
- <http://www.indiaenvironmentportal.org.in>
- <http://nptel.iitm.ac.in>
- <http://www.filtersource.com>
- <https://dgserver.dgsnd.gov.in>
- www.nesc.wvu.edu