GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering
Subject Code: 3721716
SUBJECT NAME: ENVIRONMENTAL MODELLING AND COMPUTIONAL METHODS
2nd Semester

Type of course: Environmental Engineering and Technology

Prerequisite: --

Rationale: To provide knowledge related to requirement of Environmental modelling and computing Techniques

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr.No.	Topics	Hours	Percentage weight age
1	**Introduction:** Mathematical Modeling: Scope and problem definition, Defining Systems and its component, types of model and their application, Basic and fundamental of simulation	08 hrs	24
2.	**Environmental Modelling-Applications:** Water quality modeling: Surface water quality modeling, rivers and streams, ground water pollution modeling, Air quality modeling, box model, Gaussian plume model, point source, Line source, Area Source	20 hrs	9
4.	**Introduction to Soft Computing Techniques:** Analytical Hierarchy Process, Fuzzy set theory, Neural Network, Application of GIS and RS in Environmental Engineering	12 hrs	24
5.			24

Reference Books:

1. Ramaswami A., Milford J.B., Small M.J., Integrated Environmental Modeling – Pollutant Transport, Fate, and Risk in the Environment John Wiley & Sons, 2005.

2. Chapra S.C., Surface Water Quality Modeling, McGraw–Hil, Inc., New York, 1997.

3. Benarie M.M.(1980) Urban Air Pollution Modelling,Cambridge,MA:The MIT Press.

4. Schnelle K.B. and Dey P.R.(1999) Atmospheric Dispersion Modelling Complainace Guide, MCgraw Hill.

5. Zannetti P.(1990) Air Pollution Modelling, Theories, Computational Methods and Available Software,Van Nostrand Reinhold,New York.

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Course Outcome:

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Understand the idea, methodology and basic tools of environmental modeling	
CO-2	Understand the different modeling approaches, their scope and limitations	
CO-3	Apply the Knowledge of computing techniques in environmental engineering	

After learning the course the students should be able to:

1. Understand the idea, methodology and basic tools of environmental modeling
2. Understand the different modeling approaches, their scope and limitations
3. Apply the Knowledge of computing techniques in environmental engineering.

List of Experiments:

1. Application of different software in environmental engineering.

List of Open Source Software/learning website:

- http://nptel.ac.in/
- http://elearning.vtu.ac.in/