Course code:     WSW 143     No. of credits: 3     LTP distribution: 18-0-50     Learning hours: 74       Prerrequisite course code and tifle (ff any): Noe     Department: Regional Water Studies     Course instructor(s): Prof. Aran Kansal     Course instructor(s): Prof. Aran Kansal       Contract defaults: adaan3(derivansa.c. in;     Course offered in: Sensester :     To course instructor(s): Prof. Aran Kansal     To use instructor(s): Prof. Aran Kansal       Course offered in: Sensester :     Course offered in: Sensester :     To course instructor(s): Prof. Aran Kansal     To use instructor(s): Prof. Aran Kansal       Course off and to propare a student in acquiring skills on the art of water monitoring and quantitative analysis of critical water quality management and pollution control.     To cauble students to understand the principles and the practical approaches and techniquety.     To water quality management and pollution control.       Course objectives     1     To pic     T     P       1     To pic introduction, sampling techniques, basic concept of quantitative techniques, introme methods of analysis, standard solutions, water quality standards for inferent applications     T     P       1     Toroduction, sampling techniques, basic concept of quantitative techniques, inference, methods of determination, application of data     1     0     4       3     Hardness: General considerations; causes and	Course tit	e: Water quality monitoring methods and analysis						
Model Course code and tille (if any): None     Uppartment: Regional Water Studies     Course coordinator(s): Prof. Arun Kansul   Course offered in: Senester I     Course offered in: Senester I     Course description     The course intends to praper a student in acquiring skills on the art of water monitoring and quantitative analysis of critical water quality parameters. It also brings in those aspects of chemistry which are important for water quality management and pollution control.     Course objectives     I. To enable students to understand the principles and the practical approaches and techniques; required to effectively monitor the chemical, hydrological and microbiological elements of water quality.   T   P     Introduction, sampling techniques, basic concept of quantitative techniques, instrument methods of analysis, standard solutions, water quality standards for different applications   I   0   4     Choirdes: General considerations; causes and source, environmental significance, methods of measurement, Application of data in environmental significance, environmental significance, environmental significance, ollection of samples for determination, application of data in environmental significance, environmental significance, environmental science   1   0   4     General considerations; causes and source, environmental significance, environmental science   1   0   6 <td< td=""><td>Course co</td><td>de: WSW 145 No. of credits: 3 LTP distribution: 18-0-56 Le</td><td>arning</td><td>hours</td><td><b>:</b> 74</td></td<>	Course co	de: WSW 145 No. of credits: 3 LTP distribution: 18-0-56 Le	arning	hours	<b>:</b> 74			
Department: Regional Water Studies     Course contructor(s): Prof. Arun Kansal     Course instructor(s): Prof. Arun Kansal       Contact details: ukansal@terisas.ac.in;     Course offered in: Semester I     Course offered in: Semester I       Course conterption     The course intends to prepare a student in acquiring skills on the art of water monitoring and quantifative requility management and pollution control.     Very state of the protein state of the practical approaches and techniques requires and pollution control.       Course objectives     I. To cnable students to understand the principles and the practical approaches and techniques; to interformating work of the chemical, hydrological and microbiological elements of water quality.     Very state of the principles and the practical approaches and techniques; to bild understanding of water quality parameters and their relation to public health and environment.       Course course instrument methods of analysis, standard solutions, water quality standards for different applications     I     P       Module     Toric     I.     T     P       I     Introduction, sampling techniques, basic concept of quantitative techniques, methods of analysis, standard solutions, water quality standards for different applications     I     0     4       3     Hardness: methods of analysis, standard solutions, water quality standards of the second considerations; causes and source, environmental significance, methods of determination, application of data in environmental significance, methods of dete	Pre-requis	ite course code and title (if any): None						
Course coordinator(s): Prof. Arun Kansal     Course instructor(s): Prof. Arun Kansal       Course type: Compulsory Core     Course offered in: Semester I       Course description     The course intends to prepare a student in acquiring skills on the art of water monitoring and quantitative analysis of critical water quality parameters. It also brings in those aspects of chemistry which are important for water quality analysis of critical water quality parameters. It also brings in those aspects of chemistry which are important for water quality analysis of artical water quality parameters and the practical approaches and techniques required to critectively monitor the chemical, hydrological and microbiological clements of water quality.       Course objectives     I. To enable students to understand the principles and the practical approaches and techniques required to critectively monitor the chemical, hydrological and microbiological clements of water quality.     V     V       Course objectives     I. To build understanding of water quality parameters and their relation to public health andenvironment.     V     V       Course objectives     I. To build understanding of water quality standards for different applications of data     I     0     4       Course objectives     Introduction, application of data     I     0     4       Course objectives     Introduction, application of data in environmental significance, methods of determination, application of data in environmental science     I     0     4	Department: Regional Water Studies							
Contrast details: akanal@terisas.ac.in:Course optical: compulsory CoreCourse offered in: Semester 1Course offered in: Semester 2Course offered in: Semester 2ModuleTopicLTPIntroduction, sampling techniques, basic concept of quantitative techniques, instrument methods of analysis, standard solutions, water quality standards for different applicationsLTPIntroduction, sampling techniques, basic concept of quantitative techniques, instrument methods of malysis, standard solutions, water quality standards for different applications; causes and source, environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determinati	Course co	Ordinator(s): Prof. Arun Kansal     Course instructor(s): Prof. Arun	ı Kansa	1				
Course type:   Course offered in: Semester 1     Course description   The course intends to prepare a student in acquiring skills on the art of water monitoring and quantitative analysis of critical water quality parameters. It also brings in those aspects of chemistry which are important for water quality management and pollution control.     Course objectives   1. To enable students to understand the principles and the practical approaches and techniques requirity.     2. To build understanding of water quality parameters and their relation to public health addenvironment. <b>P</b> 1   Introduction, sampling techniques, basic concept of quantitative techniques, instrument methods of analysis, standard solutions, water quality standards for different applications <b>I 0 4</b> 3.   Hardness:   1   0   4     General considerations; causes and source, environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination, application of data in environmental significance, methods of determination of dissolved oxygen, methods of determinatis cincec	Contact de	etails: akansal@terisas.ac.in;						
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12	Bacteriological analysis: Plate count test for E-coli/MPN	1	0	6			
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Evaluation criteria							

- Major Practical exam 50%
- Viva 50%

#### Learning outcomes

- 1. Understand meaning of important parameters for measuring water quality;
- 2. Water quality criteria and standards, and their relation to public health, environment and urban water cycle;
- 3. Learn how to run accurate water quality tests and to determine how the parameters relate to each other;
- 4. Plan water quality surveillance for a given aquatic environment and to understand what a test result means in terms of the health of the ecosystem.

### Pedagogical approach

Classroom teaching, field work and laboratory work.

# Materials

1. Standard methods for the examination of water and wastewater published by APHA 15th ed.

2. Keith, L.H. [Ed.] 1988 Principles of Environmental Sampling. American Chemical Society

# Additional information (if any)

### Student responsibilities

The course has chemistry, laboratory experiments, and field visits. Opportunity to repeat laboratory experiments will be very limited and hence regular attendance is important.

#### **Course reviewers:**

- 1. Prof Ram Karan Singh, Department of Civil Engineering, King Khalid University, Saudi Arabia.
- 2. Prof Narender Kanhe, Principal, Guru Nanak Institute of Engineering and Management, Nagpur.