Course Code | CE1025
---|---
Course Name | WATER SUPPLY AND ENVIRONMENTAL ENGINEERING DESIGN
Prerequisites | NIL
Category | WATER RESOURCE ENGINEERING (P-PROFESSIONAL)

Instructional objectives

<table>
<thead>
<tr>
<th>Instructional objectives no.</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To know the basics, importance, and methods of water supply.</td>
</tr>
<tr>
<td>2</td>
<td>To study the various sources and properties of water.</td>
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<tr>
<td>3</td>
<td>To understand the various methods of conveyance of water.</td>
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<tr>
<td>4</td>
<td>To learn the objectives and methods of water treatment and to study the features and function of different water treatment units.</td>
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<tr>
<td>5</td>
<td>To learn the importance of rain water harvesting and water pollution</td>
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</tbody>
</table>

Student outcomes

<table>
<thead>
<tr>
<th>Student outcome as per ABET</th>
<th>Student outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>an ability to apply knowledge of mathematics, science, and engineering</td>
</tr>
<tr>
<td>c</td>
<td>an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability</td>
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<tr>
<td>e</td>
<td>an ability to identify, formulate, and solve engineering problems</td>
</tr>
<tr>
<td>h</td>
<td>the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context</td>
</tr>
<tr>
<td>i</td>
<td>a recognition of the need for, and an ability to engage in life-long learning</td>
</tr>
<tr>
<td>J</td>
<td>a knowledge of contemporary issues</td>
</tr>
</tbody>
</table>

Section Lesson Plan

<table>
<thead>
<tr>
<th>Lecture No</th>
<th>Topic</th>
<th>Instructional objectives</th>
<th>Student outcome</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Introduction – Water supply – Environmental Engg. – role of Environmental Engineer – Water</td>
<td>1</td>
<td>a, c</td>
<td>1,3</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Cycle Test</td>
<td>Notes</td>
<td></td>
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<tr>
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<tr>
<td>supply – development of public water supply</td>
<td></td>
<td>1,2</td>
<td></td>
<td></td>
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<tr>
<td>3-4</td>
<td>Need for protected water supplies- objectives of water supply systems – water supply scheme- quantity of water</td>
<td>1</td>
<td>a, c, 1,3</td>
<td></td>
</tr>
<tr>
<td>5-6</td>
<td>Design period – per capita consumption- fluctuations in demand pattern – population forecast</td>
<td>1</td>
<td>a, c, e, 1,3</td>
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<tr>
<td>7-8</td>
<td>Arithmetical, Incremental, Geometric methods – problems</td>
<td>1</td>
<td>a, c, e, 1,3</td>
<td></td>
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<tr>
<td>9-10</td>
<td>Sources of water – surface and ground water sources</td>
<td>2</td>
<td>a, c, 1,2</td>
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</table>

**CYCLE TEST –I (One period)**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Cycle Test</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,12</td>
<td>Quality of water- physical, chemical and biological aspects.</td>
<td>2</td>
<td>a, c, 1,2</td>
</tr>
<tr>
<td>13,14</td>
<td>Analysis of water – water quality standards</td>
<td>2</td>
<td>a, c, 1,2</td>
</tr>
<tr>
<td>15,16</td>
<td>Conveyance and distribution system – Intake structures – pipe materials – Hydraulics of flow in pipes</td>
<td>3</td>
<td>a, c, 1,3</td>
</tr>
<tr>
<td>17,18</td>
<td>Laying, Jointing, testing of pipes – pumping stations – selection of pumps</td>
<td>3</td>
<td>a, c, 1,3</td>
</tr>
<tr>
<td>19,20</td>
<td>Methods of distributing water- storage and distribution reservoirs – analysis of distribution system</td>
<td>3</td>
<td>a, c, 1,3</td>
</tr>
<tr>
<td>21,22,23</td>
<td>Hardy-cross method of balancing- equivalent pipes</td>
<td>3</td>
<td>a, c, e, 1,2</td>
</tr>
</tbody>
</table>

**SURPRISE TEST & CYCLE TEST –II (one period)**

<table>
<thead>
<tr>
<th>Section</th>
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<th>Cycle Test</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>24,25</td>
<td>Definition of unit process and unit operations - objectives of water treatment - methods &amp; sequence of treatment of water</td>
<td>4</td>
<td>a, c, 1,3</td>
</tr>
<tr>
<td>26,27</td>
<td>Typical flow sheet treating hard groundwater turbid surface water - aeration , coagulation, flocculation filtration and disinfection</td>
<td>4</td>
<td>a, c, 1,3</td>
</tr>
<tr>
<td>28,29,30</td>
<td>Principles functions of design - sedimentation - flocculation filter units</td>
<td>4</td>
<td>a, c, 1,3</td>
</tr>
<tr>
<td>31,32</td>
<td>Miscellaneous methods -iron and manganese removal - defluoridation and demineralization.</td>
<td>4</td>
<td>a, c, e, 1,3</td>
</tr>
<tr>
<td>33,34,35</td>
<td>Sustainable Development-Rain Water harvesting-Methods-Water Pollution</td>
<td>4</td>
<td>a, c, 1,3</td>
</tr>
<tr>
<td>36,37,38</td>
<td>Causes and effects- Role of regulatory bodies &amp;</td>
<td>4</td>
<td>a, c, 1,3</td>
</tr>
</tbody>
</table>
Text Books


Reference Books


Faculty handling:

1. Mr.J.S.Sudarsan
2. Mr.K.Prasanna