**College of Engineering**

**Department of Civil Engineering**

# CE 502 Hydrometry

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| **Credit and Contact hours** | 3 / 3 (Lectures), 0 (Tutorials), 0 (Laboratory) |
| **Required, or Elective** | Elective |
| **Course Description** | Velocity, discharge, pressure and shear measurement's methods in open and closed conduits. Precipitation and infiltration relationship. Hydro-meteorological data collection and analysis. Measurement of water levels, stage discharge relationships. Collection and analyses of sediment data. -Flow measurement structures. Data acquisition, analysis and interpretation. |
| **Prerequisites or Co-requisites** | None |
| **Course Learning Outcomes** | Students completing this course successfully will be able to: |

| Course Learning Outcomes (CLOs) | *Related Student Outcomes (SO)* |
|---|---|
| **CLO1.** Recognize the different performing measurements related to water engineering and meteorology. K1 | **SO1** |
| **CLO2.** Identify and illustrate the basic principles and concepts of data acquisition and interpretation. K1 | **SO1** |
| **CLO3.** Conduct and analyze measurements related to Flow measurement structures. S1 | **SO2** |
| **CLO4.** Demonstrate professional engineering and ethical values in assigned projects for presenting the recent technology and the update in the Hydrometry field with high academic integrity. V1 | **SO6** |

**Student Outcomes related to this Course**

SO 1 Recognize advanced engineering knowledge, concepts, and techniques to identify, interpret, and analyze complex and real-life engineering problems.

SO 2 Provide solutions for complex and real-life engineering problems through critical thinking and the use of modern engineering tools, and identify their impact on social, global, cultural, environmental, safety, and economic factors.

SO 6 Demonstrate scientific integrity, ethical responsibility, and academic values in scientific publications, research projects, and thesis work.

SO 7 Effectively manage, individually or in groups, specialized tasks and activities in coursework, projects, assignments, and research work with a high level of autonomy and responsibility.

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<tr><td>Topics Covered</td><td>
<table>
<tr><th>List of Topics</th><th>Related CLOs</th></tr>
<tr><td>1. Measurement of velocity, discharge, pressure, shear, turbulence in open and closed conduits</td><td>CLO 1,2</td></tr>
<tr><td>2. Measurement of precipitation, infiltration, and hydro-meteorological variables.</td><td>CLO 1,2</td></tr>
<tr><td>3. Measurement of water levels, stage discharge relationships</td><td>CLO 1,2</td></tr>
<tr><td>4. velocity-area methods</td><td>CLO 3</td></tr>
<tr><td>5. Flow measurement structures</td><td>CLO 3</td></tr>
<tr><td>6. Collection and analyses of sediment data</td><td>CLO 3</td></tr>
<tr><td>7. Data acquisition, analysis and interpretation.</td><td>CLO 1,2,3</td></tr>
<tr><td>8. Satellite Remote Sensing in Hydrometry</td><td>CLO 4</td></tr>
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<tr><td>Textbook(s) and Other Required Material</td><td>
<ul>
<li>Hydrometry: Principles and Practice, 2nd Edition , Reginald W. Herschy (Editor)</li>
<li>Hydrometry, A comprehensive introduction to the measurement of flow in open channels ByW. Boiten , 3rd Edition, eBook ISBN9781003059288.</li>
<li>Hydrometry IHE Delft Lecture Note Series By: W. Boiten</li>
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<tr><td>Grading System</td><td>
<table>
<tr><td>Assignments and Quizzes</td><td>15%</td></tr>
<tr><td>Lecture attendance</td><td>--</td></tr>
<tr><td>Seminar presentation</td><td>5%</td></tr>
<tr><td>Overview (literature review) paper</td><td>5%</td></tr>
<tr><td>Project - report and oral presentation</td><td>10%</td></tr>
<tr><td>Mid-term exam</td><td>25%</td></tr>
<tr><td>Final Exam</td><td>40%</td></tr>
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<tr><td>Instructors</td><td>Dr. Ibrahim Elsebaie</td></tr>
<tr><td>Date of Review</td><td>March, 2025</td></tr>
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