

CE 521 Irrigation Engineering

| Credit and Contact hours | 3 / 3 (Lectures), 0 (Tutorials), 0 (Laboratory) | | | | | | | | | | | | | | |
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| Required, or Elective | Elective | | | | | | | | | | | | | | |
| Course Description | In this course, students will be introduced to the importance of irrigation systems. They will also be introduced to the hydraulic designs of various irrigation structures such as weirs, barrages, cross drainage works, dams, silt ejectors and excluders, earth dams, and canal falls. Various components of head work and head regulators will be discussed in this course. | | | | | | | | | | | | | | |
| Prerequisites or Co-requisites | None | | | | | | | | | | | | | | |
| Course Learning Outcomes | <p>Students completing this course successfully will be able to:</p> <table> <tr> <th>Course Learning Outcomes (CLOs)</th><th>Related Student Outcomes (SO)</th></tr> <tr> <td>CLO1. Explain the basic hydraulic designs for different irrigation systems. K1</td><td>SO1</td></tr> <tr> <td>CLO2. Calculate water requirements related to crops for different seasons. S1</td><td>SO2</td></tr> <tr> <td>CLO3. Apply hydraulic models to analyze hydraulic designs of different components of irrigation projects. S1</td><td>SO2</td></tr> <tr> <td>CLO4. Perform and demonstrate different types of irrigation systems commonly used and apply the effective one as a case study. V1</td><td>SO6</td></tr> </table> | Course Learning Outcomes (CLOs) | Related Student Outcomes (SO) | CLO1. Explain the basic hydraulic designs for different irrigation systems. K1 | SO1 | CLO2. Calculate water requirements related to crops for different seasons. S1 | SO2 | CLO3. Apply hydraulic models to analyze hydraulic designs of different components of irrigation projects. S1 | SO2 | CLO4. Perform and demonstrate different types of irrigation systems commonly used and apply the effective one as a case study. V1 | SO6 | | | | |
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| CLO4. Perform and demonstrate different types of irrigation systems commonly used and apply the effective one as a case study. V1 | SO6 | | | | | | | | | | | | | | |
| Student Outcomes related to this Course | <p>SO 1 Recognize advanced engineering knowledge, concepts, and techniques to identify, interpret, and analyze complex and real-life engineering problems.</p> <p>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.</p> <p>SO 6 Demonstrate scientific integrity, ethical responsibility, and academic values in scientific publications, research projects, and thesis work.</p> | | | | | | | | | | | | | | |
| Topics Covered | <table> <tr> <th>List of Topics</th><th>Related CLOs</th></tr> <tr> <td>1. Introduction</td><td>CLO 1,3,4</td></tr> <tr> <td>2. Water Requirements for Crops</td><td>CLO 2</td></tr> <tr> <td>3. Diversion head work</td><td>CLO 1,3</td></tr> <tr> <td>4. Cross Drainage Work and Canal Falls</td><td>CLO 1,3,4</td></tr> <tr> <td>5. Storage Head Works</td><td>CLO 3</td></tr> <tr> <td>6. Spillways and Energy Dissipation</td><td>CLO 3,4</td></tr> </table> | List of Topics | Related CLOs | 1. Introduction | CLO 1,3,4 | 2. Water Requirements for Crops | CLO 2 | 3. Diversion head work | CLO 1,3 | 4. Cross Drainage Work and Canal Falls | CLO 1,3,4 | 5. Storage Head Works | CLO 3 | 6. Spillways and Energy Dissipation | CLO 3,4 |
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| Textbook(s) and Other Required Material | <ul style="list-style-type: none"> • Irrigation Engineering and Hydraulic Structures, S.K. Garg, Khanna Publications. • Irrigation and Water Power Engineering, B.C. Punmia, Laxmi Publication | | | | | | | | | | |
| Grading System | <table> <tr> <td>Homework</td><td>10%</td></tr> <tr> <td>Lecture attendance</td><td>--</td></tr> <tr> <td>Midterm Exam</td><td>20%</td></tr> <tr> <td>Project-report and presentation</td><td>30%</td></tr> <tr> <td>Final Exam</td><td>40%</td></tr> </table> | Homework | 10% | Lecture attendance | -- | Midterm Exam | 20% | Project-report and presentation | 30% | Final Exam | 40% |
| Homework | 10% | | | | | | | | | | |
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| Midterm Exam | 20% | | | | | | | | | | |
| Project-report and presentation | 30% | | | | | | | | | | |
| Final Exam | 40% | | | | | | | | | | |
| Instructors | Dr. Yazeed Alabbad, Office: 2A68, Email: yalabbad@ksu.edu.sa | | | | | | | | | | |
| Date of Review | March, 2025 | | | | | | | | | | |