



Lesson Plan No. 1	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: a. Apply principles to assess project costs. b. Analyze factors influencing accurate estimates. c. Develop skills in estimation techniques.
<b>Teaching Aids (if any)</b>	a. Chalk and talk b. Use of Nearpod tool for online quiz
<b>Teaching Development</b>	<ol style="list-style-type: none"><li>1. <b>Introduction</b> (5 minutes)<ul style="list-style-type: none"><li>- Ask questions. How does accurate estimation contribute to effective resource allocation? Discuss the importance of adapting estimation principles to different project types. How can the principles of estimating be applied in a real-world project scenario? Explain the role of risk assessment in the estimation process.</li><li>- Explore the fundamental Principles of Estimating, a crucial aspect of project management and financial planning.</li><li>- Understand the significance of accurate estimation in guiding successful project outcomes and resource allocation.</li><li>- Delve into the broad scope of estimating principles, covering various industries and project types.</li><li>- Connect theoretical principles to practical scenarios, emphasizing their relevance in real-world project management.</li><li>- Foster essential skills for estimating, empowering students to contribute effectively to project planning and execution.</li></ul></li><li>2. <b>Development</b> (30 minutes)<ol style="list-style-type: none"><li>a. <b>Foundation Building:</b> Lay the groundwork by introducing students to the foundational principles of estimating, creating a solid understanding of its significance in project management.</li><li>b. <b>Conceptual Framework:</b> Establish a conceptual framework for estimation, enabling students to grasp the theoretical underpinnings and apply them across diverse project scenarios.</li><li>c. <b>Case Studies:</b> Engage students with real-world case studies, encouraging the practical application of estimating principles and enhancing problem-solving skills.</li></ol></li></ol>



	<p>d. Interactive Learning: Foster an interactive learning environment, incorporating discussions, exercises, and collaborative activities to reinforce comprehension and facilitate skill development in estimation techniques.</p> <p>e. Continuous Assessment: Implement continuous assessment strategies to gauge student progress, providing timely feedback for refinement and mastery of estimating principles.</p> <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none"><li>- Provide a project cost breakdown and ask students to identify key cost components and estimate their proportions, encouraging a detailed understanding of cost estimation principles.</li><li>- Describe a project with potential risks, and task students with estimating contingency budgets to mitigate these risks, promoting awareness of risk management in estimating.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<p>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</p> <p>2. Suggested Reading</p> <ul style="list-style-type: none"><li>- <a href="https://www.youtube.com/watch?v=cIF0Stxgim0&amp;list=PLm_MSClsnwm_pObRbV8yKtHEKGjKmQJSw&amp;index=1&amp;pp=iAQB">https://www.youtube.com/watch?v=cIF0Stxgim0&amp;list=PLm_MSClsnwm_pObRbV8yKtHEKGjKmQJSw&amp;index=1&amp;pp=iAQB</a></li></ul> <p>3. Homework</p> <ul style="list-style-type: none"><li>- Compare and contrast two different estimation techniques. Provide examples of scenarios where each technique may be more suitable.</li></ul> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<p>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</p> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 2	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> <li>a. Explore techniques for extracting project quantities.</li> <li>b. Understand various measurement modes in construction.</li> <li>c. Learn the importance of organized documentation.</li> </ul>
<b>Teaching Aids (if any)</b>	<ul style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ul>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction</b> (5 minutes) <ul style="list-style-type: none"> <li>- Ask questions. What is meant by "quantity takeoff" in construction projects? Name three common units of measurement used in construction. What is the main purpose of a Bill of Quantities (BOQ)? Identify two methods for taking out quantities in construction. How does documentation assist in the construction estimation process?</li> <li>- Embark on a journey to master the art of extracting project quantities, laying the groundwork for precise and efficient construction estimations.</li> <li>- Dive into the world of construction measurement modes, unraveling the complexities of different approaches to quantify materials, labor, and resources.</li> <li>- Acquire essential skills in creating structured sheets and documentation, fostering clarity and coherence in presenting project data crucial for accurate estimations.</li> <li>- Explore the pivotal role of the Bill of Quantities (BOQ), unraveling its purpose as a comprehensive document that encapsulates project details essential for precise cost estimation and project management.</li> </ul> </li> <li>2. <b>Development</b> (30 minutes) <ul style="list-style-type: none"> <li>a. <b>Techniques and Tools:</b> Introduce a variety of tools and software that facilitate accurate quantity takeoff, emphasizing the transition from manual to digital methods for increased efficiency and precision.</li> <li>b. <b>Measurement Standards:</b> Discuss the importance of adhering to industry standards in measurement to ensure consistency and reliability across projects, highlighting specific examples like the International Measurement Standards (IMS).</li> <li>c. <b>Documentation Practices:</b> Teach the best practices in creating and maintaining sheets and</li> </ul> </li> </ol>





	<p>documentation, including the use of templates, coding systems, and digital platforms to streamline the process.</p> <p>d. BOQ Composition and Application:</p> <p>e. Break down the components of a Bill of Quantities, illustrating its application in project bidding, cost control, and financial management, and how it serves as a communication tool between project stakeholders.</p> <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none"><li>- Provide a simple architectural drawing. Ask students to quickly estimate the quantities of a specific element (e.g., bricks for a wall) using a chosen method.</li><li>- Give examples of various documentation types. Students quickly categorize them into templates, sheets, and BOQ-related documents.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/zWxF6sk9Uos?si=qIx3N0byCFiEz4xx">https://youtu.be/zWxF6sk9Uos?si=qIx3N0byCFiEz4xx</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Given a simplified plan of a residential building, calculate the quantities of materials needed for the foundation, including concrete, steel reinforcement, and formwork. Show your work and explain the method used.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, why, who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Methods of Taking out Quantities, Mode of Measurement</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 3	Course Name: Construction Planning and Management	Course No.: CE-603
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Objectives	At the end of the lesson the student shall be able to: a. Master techniques for accurate quantity takeoff. b. Explore diverse construction measurement methodologies. c. Develop proficiency in creating structured documents.
Teaching Aids (if any)	a. Chalk and talk b. Use of Nearpod tool for online quiz
Teaching Development	<ol style="list-style-type: none"><li><b>Introduction (5 minutes)</b><ul style="list-style-type: none"><li>Ask questions. What is quantity takeoff, and why is it essential in construction? Name two common measurement modes used in construction projects. Why is organized documentation crucial in the estimation process? List three key components found in a Bill of Quantities (BOQ).</li></ul></li><li><b>Embark on a journey to master the art of extracting project quantities, laying the groundwork for precise and efficient construction estimations.</b></li><li><b>Dive into the world of construction measurement modes, unraveling the complexities of different approaches to quantify materials, labor, and resources.</b></li><li><b>Explore the pivotal role of the Bill of Quantities (BOQ), unraveling its purpose as a comprehensive document that encapsulates project details essential for precise cost estimation and project management.</b></li><li><b>Acquire essential skills in creating structured sheets and documentation, fostering clarity and coherence in presenting project data crucial for accurate estimations.</b></li></ol> <ol style="list-style-type: none"><li><b>Development (30 minutes)</b><ol style="list-style-type: none"><li><b>In-Depth Quantity Extraction Techniques:</b> Dive into advanced methods of extracting quantities, exploring digital tools and manual techniques for precise construction estimations.</li><li><b>Strategic Mode of Measurement:</b> Illuminate strategic considerations in choosing measurement modes, emphasizing their impact on project accuracy, cost effectiveness, and industry compliance.</li><li><b>Documentation Efficiency Strategies:</b></li></ol></li></ol>



	<p>Develop strategies for creating efficient and organized documentation, introducing students to digital platforms and standardized templates for streamlined project data management.</p> <p>d. BOQ Application and Analysis: Guide students through practical applications of the Bill of Quantities (BOQ), emphasizing its role in bidding, cost control, and effective project communication. Analyze sample BOQs to enhance understanding of its structure and significance.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Provide various construction measurement units and have students match them with the correct mode of measurement, encouraging swift recall and understanding.</li><li>- Present different construction-related documents and ask students to categorize them into sheets, templates, and BOQ-related documentation within a 5-minute timeframe.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/dA_cfWgtxfw?si=J14iaT0uB96TxgUz">https://youtu.be/dA_cfWgtxfw?si=J14iaT0uB96TxgUz</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Investigate current industry standards for quantity takeoff methods and measurement modes. Discuss their significance and potential impact on the accuracy of project estimates.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, why, who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Methods of Taking out Quantities, Mode of Measurement</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



<b>Lesson Plan No. 4</b>	<b>Course Name: Construction Planning and Management</b>	<b>Course No.: CE-603</b>
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> <li>a. Explore different types of project estimates.</li> <li>b. Grasp the role and importance.</li> <li>c. Develop skills for accurate calculations.</li> </ol>
<b>Teaching Aids (if any)</b>	<ol style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ol>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction (5 minutes)</b> <ul style="list-style-type: none"> <li>- Ask questions. How does accurate estimation contribute to effective resource allocation? Discuss the importance of adapting estimation principles to different project types. How can the principles of estimating be applied in a real-world project scenario? Explain the role of risk assessment in the estimation process.</li> <li>- Immerse into the realm of project estimation by introducing various types, shedding light on how preliminary, detailed, and definitive estimates serve distinct purposes in project planning.</li> <li>- Uncover the intricacies of contingencies, emphasizing their pivotal role in mitigating uncertainties and unexpected costs, ensuring students comprehend the importance of proactive cost planning.</li> <li>- Bridge theory and practice by illustrating practical applications, empowering students to navigate the complexities of estimating costs in diverse project scenarios with confidence and precision.</li> <li>- Embark on the journey of mastering work charge estimates, providing students with the essential skills to calculate costs accurately and efficiently, preparing them for real-world applications in project</li> </ul> </li> <li>2. <b>Development (30 minutes)</b> <ol style="list-style-type: none"> <li>a. Estimate Classification Exploration: Dive deep into various estimate types, elucidating the nuances between preliminary, detailed, and definitive estimates. Illustrate how each plays a distinct role in project phases, fostering a comprehensive understanding.</li> <li>b. Strategic Contingency Planning: Delve into the strategic aspects of contingencies, guiding students to identify potential risks and uncertainties in project</li> </ol> </li> </ol>





	<p>estimation. Develop skills in implementing contingencies effectively, ensuring adaptability to unforeseen challenges.</p> <p>c. <b>Work Charge Estimate Precision:</b> Focus on the intricacies of work charge estimates, providing students with hands-on exercises and scenarios to master accurate calculations. Incorporate real-world examples to enhance practical application skills.</p> <p>d. <b>Case Studies and Applications:</b> Supplement theoretical knowledge with case studies, allowing students to apply concepts to diverse projects. Foster critical thinking and decision-making skills as students navigate the complexities of estimating costs in practical situations.</p> <p><b>3. Exercise (5 minutes) –</b></p> <ul style="list-style-type: none"> <li>- Challenge students to categorize given scenarios into preliminary, detailed, or definitive estimates within a 5-minute timeframe, reinforcing their understanding of estimate types.</li> <li>- Provide a project case with potential uncertainties. Task students to calculate and apply contingencies swiftly, enhancing their ability to factor in unforeseen circumstances in estimates.</li> </ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"> <li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li> <li>2. Suggested Reading             <ul style="list-style-type: none"> <li>- <a href="https://youtu.be/SyyYHhkNAr4?si=GC8jKYhyzYR_FEnI">https://youtu.be/SyyYHhkNAr4?si=GC8jKYhyzYR_FEnI</a></li> </ul> </li> <li>3. Homework             <ul style="list-style-type: none"> <li>- Investigate recent construction projects and analyze how contingencies were implemented to address unforeseen challenges. Discuss the impact on project outcomes.</li> </ul> </li> </ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"> <li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li> <li>2. Nearpod Quiz on Types of estimates, Contingencies, Work charge estimate</li> </ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



<b>Lesson Plan No. 5</b>	<b>Course Name: Construction Planning and Management</b>	<b>Course No.: CE-603</b>
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> <li>Apply principles to assess project costs.</li> <li>Analyze factors influencing accurate estimates.</li> <li>Develop skills in estimation techniques.</li> </ol>
<b>Teaching Aids (if any)</b>	<ol style="list-style-type: none"> <li>Chalk and talk</li> <li>Use of Nearpod tool for online quiz</li> </ol>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li><b>Introduction (5 minutes)</b> <ul style="list-style-type: none"> <li>Ask questions. Differentiate between preliminary, detailed, and definitive estimates. Explain the purpose and importance of contingencies in project estimation. Define work charge estimates and their role in construction projects. In what situations would you choose a preliminary estimate over a detailed or definitive one?</li> <li>Explore the fundamental Principles of Estimating, a crucial aspect of project management and financial planning.</li> <li>Understand the significance of accurate estimation in guiding successful project outcomes and resource allocation.</li> <li>Delve into the broad scope of estimating principles, covering various industries and project types.</li> <li>Connect theoretical principles to practical scenarios, emphasizing their relevance in real-world project management.</li> <li>Foster essential skills for estimating, empowering students to contribute effectively to project planning and execution.</li> </ul> </li> <li><b>Development (30 minutes)</b> <ol style="list-style-type: none"> <li><b>Foundation Building:</b> Lay the groundwork by introducing students to the foundational principles of estimating, creating a solid understanding of its significance in project management.</li> <li><b>Conceptual Framework:</b> Establish a conceptual framework for estimation, enabling students to grasp the theoretical underpinnings and apply them across diverse project scenarios.</li> <li><b>Case Studies:</b> Engage students with real-world case studies, encouraging the practical application of estimating principles and enhancing problem-solving skills.</li> </ol> </li> </ol>



	<p>d. Interactive Learning: Foster an interactive learning environment, incorporating discussions, exercises, and collaborative activities to reinforce comprehension and facilitate skill development in estimation techniques.</p> <p>e. Continuous Assessment: Implement continuous assessment strategies to gauge student progress, providing timely feedback for refinement and mastery of estimating principles.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Provide a project cost breakdown and ask students to identify key cost components and estimate their proportions, encouraging a detailed understanding of cost estimation principles.</li><li>- Distribute brief project case studies and have students identify the most appropriate estimate type, contingencies, and work charge considerations, promoting quick decision-making in varied project contexts.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtube.com/playlist?list=PLm_MSCIsnwm_pObRbV8yKtHEKGjKmQJSw&amp;si=wJ90TaSGtp3BKCc1">https://youtube.com/playlist?list=PLm_MSCIsnwm_pObRbV8yKtHEKGjKmQJSw&amp;si=wJ90TaSGtp3BKCc1</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Explore and evaluate a construction estimation software tool. Discuss its features, advantages, and limitations in handling various estimate types, contingencies, and work charge scenarios.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Types of estimates, Contingencies, Work charge estimate</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 6	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> <li>a. Grasp key elements for project planning.</li> <li>b. Comprehend the role and significance.</li> <li>c. Master steps for project approval.</li> </ul>
<b>Teaching Aids (if any)</b>	<ul style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ul>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction</b> (5 minutes) <ul style="list-style-type: none"> <li>- Ask questions. What are the key elements typically found in a construction layout plan? Explain the importance of an index plan in construction project management. How do sub-heads contribute to accurate cost estimation in construction projects? Define the purpose and role of a Schedule of Rates (SOR) in construction.</li> <li>- Navigate the intricacies of construction planning by deciphering the fundamental concepts of layout and index plans, essential blueprints for project execution.</li> <li>- Gain insight into the critical elements of sub-heads and Schedule of Rates (SOR), unraveling their significance in cost estimation and resource allocation.</li> <li>- Explore the administrative approval process, understanding the procedural steps and documentation required to move projects from conceptualization to execution.</li> <li>- Develop proficiency in securing expenditure sanction, delving into the financial approval mechanisms vital for project budget execution and successful completion.</li> </ul> </li> <li>2. <b>Development</b> (30 minutes) <ol style="list-style-type: none"> <li>a. In-Depth Layout and Index Plans Exploration: Engage students in a detailed exploration of layout and index plans, covering their significance, components, and the role they play in guiding construction projects.</li> <li>b. Understanding Sub-Heads and SOR Application: Foster a deeper understanding of sub-heads and Schedule of Rates (SOR), enabling students to grasp how these elements influence accurate cost estimation and project budgeting.</li> <li>c. Navigating Administrative Approval Process:</li> </ol> </li> </ol>



	<p>Guide students through the administrative approval process, elucidating the procedural requirements, documentation, and decision-making involved in gaining the green light for project initiation.</p> <p>d. Mastering Expenditure Sanction Procedures: Provide comprehensive insights into securing expenditure sanction, equipping students with the knowledge needed for navigating financial approval processes and ensuring successful project implementation within allocated budgets.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"> <li>- Present various construction plans and ask students to quickly identify the layout plan. Promote rapid recognition of key components.</li> <li>- Provide a set of index plans and request students to match them with corresponding construction projects. Enhance understanding of index plans and their applicability.</li> </ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"> <li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li> <li>2. Suggested Reading             <ul style="list-style-type: none"> <li>- <a href="https://youtu.be/TbhywwozxJw?si=Z7MuAWz6LUMuFOLx">https://youtu.be/TbhywwozxJw?si=Z7MuAWz6LUMuFOLx</a></li> </ul> </li> <li>3. Homework             <ul style="list-style-type: none"> <li>- Analyze a construction project's documentation, focusing on layout and index plans. Discuss how these plans contribute to effective project management.</li> </ul> </li> </ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"> <li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li> <li>2. Nearpod Quiz on Layout plan, index plan. Sub-heads, SOR. Administrative approval, expenditure sanction.</li> </ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 7	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> <li>a. Grasp key elements for project planning.</li> <li>b. Comprehend the role and significance.</li> <li>c. Master steps for project approval.</li> </ul>
<b>Teaching Aids (if any)</b>	<ul style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ul>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction (5 minutes)</b> <ul style="list-style-type: none"> <li>- Ask questions. Differentiate between an index plan and a layout plan, highlighting their distinct purposes? Name two measures to control expenditures effectively during a construction project. List the essential documents required for administrative approval in construction projects. How do layout and index plans influence the creation of a Schedule of Rates (SOR)?</li> <li>- Navigate the intricacies of construction planning by deciphering the fundamental concepts of layout and index plans, essential blueprints for project execution.</li> <li>- Gain insight into the critical elements of sub-heads and Schedule of Rates (SOR), unraveling their significance in cost estimation and resource allocation.</li> <li>- Explore the administrative approval process, understanding the procedural steps and documentation required to move projects from conceptualization to execution.</li> <li>- Develop proficiency in securing expenditure sanction, delving into the financial approval mechanisms vital for project budget execution and successful completion.</li> </ul> </li> <li>2. <b>Development (30 minutes)</b> <ol style="list-style-type: none"> <li>a. In-Depth Layout and Index Plans Exploration: Engage students in a detailed exploration of layout and index plans, covering their significance, components, and the role they play in guiding construction projects.</li> <li>b. Understanding Sub-Heads and SOR Application: Foster a deeper understanding of sub-heads and Schedule of Rates (SOR), enabling students to grasp how these elements influence accurate cost estimation and project budgeting.</li> <li>c. Navigating Administrative Approval Process:</li> </ol> </li> </ol>



	<p>Guide students through the administrative approval process, elucidating the procedural requirements, documentation, and decision-making involved in gaining the green light for project initiation.</p> <p>d. Mastering Expenditure Sanction Procedures: Provide comprehensive insights into securing expenditure sanction, equipping students with the knowledge needed for navigating financial approval processes and ensuring successful project implementation within allocated budgets..</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"> <li>- Create a timeline of administrative approval steps and ask students to arrange them chronologically within a 5-minute timeframe. Strengthen understanding of procedural sequences.</li> <li>- Present a construction project scenario and ask students to identify critical points for expenditure sanction approval. Foster quick and informed decision-making skills within a budgetary context.</li> </ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"> <li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li> <li>2. Suggested Reading             <ul style="list-style-type: none"> <li>- <a href="https://youtu.be/TbhymwozxJw?si=Z7MuAWz6LUMuF0Lx">https://youtu.be/TbhymwozxJw?si=Z7MuAWz6LUMuF0Lx</a></li> </ul> </li> <li>3. Homework             <ul style="list-style-type: none"> <li>- Develop a budget for a construction project, incorporating layout and index plans, SOR, and administrative approval requirements. Discuss potential challenges in budgeting.</li> </ul> </li> </ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"> <li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li> <li>2. Nearpod Quiz on Layout plan, index plan. Sub-heads, SOR. Administrative approval, expenditure sanction.</li> </ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



<b>Lesson Plan No. 8</b>	<b>Course Name: Construction Planning and Management</b>	<b>Course No.: CE-603</b>
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> <li>a. Examine components and implications.</li> <li>b. Learn the role of contingencies.</li> <li>c. Develop skills for accurate calculations.</li> </ul>
<b>Teaching Aids (if any)</b>	<ul style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ul>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction (5 minutes)</b> <ul style="list-style-type: none"> <li>- Ask questions. Name three factors influencing the cost of work in construction projects. Identify two components of overhead charges commonly found in construction projects. Explain the primary purpose of contingencies in project budgeting and management. List three steps involved in effective contingency planning for construction projects.</li> <li>- Uncover the multifaceted aspects influencing the Cost of Works, exploring the intricate interplay between materials, labor, and external variables crucial for accurate project budgeting.</li> <li>- Delve into the realm of overhead charges, dissecting the various components and understanding their impact on overall project expenses, highlighting the need for strategic allocation.</li> <li>- Explore the dynamic role of contingencies in managing uncertainties, emphasizing their significance as a financial safety net for unexpected challenges during project execution.</li> <li>- Establish a foundation for precise Work Charge calculations, empowering learners with the skills to accurately estimate and allocate costs, ensuring effective project budget establishment and management.</li> </ul> </li> <li>2. <b>Development (30 minutes)</b> <ul style="list-style-type: none"> <li>a. <b>Factors Influencing Costs Exploration:</b> Conduct an in-depth examination of the myriad factors impacting the Cost of Works, including materials, labor, location, and market conditions. Illustrate the dynamic nature of these influences.</li> <li>b. <b>Decoding Overhead Charges Components:</b> Break down the components of overhead charges, exploring direct and indirect costs. Discuss how these charges contribute</li> </ul> </li> </ol>



	<p>to the overall project expenses and influence budgetary decisions.</p> <p>c. Strategic Contingency Planning Skills: Foster strategic thinking in managing uncertainties by developing contingency planning skills. Guide students to identify potential risks and establish contingency budgets for effective risk mitigation.</p> <p>d. Work Charge Precision Techniques: Equip students with techniques for precise Work Charge establishment, emphasizing accurate calculations and allocation strategies. Illustrate real-world scenarios to enhance practical application skills in project cost estimation.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Present a construction project scenario and ask students to quickly identify and list the factors influencing the Cost of Works within a 5-minute timeframe, promoting swift recognition and understanding.</li><li>- Present a concise case study involving various cost factors, overhead charges, and contingencies. Engage students in a dynamic discussion to analyze the scenario and propose effective Work Charge establishment strategies within the time constraint.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/TbhymwozxJw?si=Z7MuAWz6LUMuF0Lx">https://youtu.be/TbhymwozxJw?si=Z7MuAWz6LUMuF0Lx</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Investigate different industries and analyze how overhead charges vary. Discuss the impact of these variations on the overall cost structure of projects.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, why, who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Factors affecting cost of work, overhead charges, contingencies and work charge establishment.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 9	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> <li>a. Examine components and implications.</li> <li>b. Learn the role of contingencies.</li> <li>c. Develop skills for accurate calculations.</li> </ul>
<b>Teaching Aids (if any)</b>	<ul style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ul>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction</b> (5 minutes) <ul style="list-style-type: none"> <li>- Ask questions. Why is precise work charge establishment crucial in construction project management? Name two key factors considered when calculating the work charge for a project. Discuss one common challenge in accurately estimating construction project costs. Provide one strategy for effectively controlling overhead charges in a project.</li> <li>- Uncover the multifaceted aspects influencing the Cost of Works, exploring the intricate interplay between materials, labor, and external variables crucial for accurate project budgeting.</li> <li>- Delve into the realm of overhead charges, dissecting the various components and understanding their impact on overall project expenses, highlighting the need for strategic allocation.</li> <li>- Explore the dynamic role of contingencies in managing uncertainties, emphasizing their significance as a financial safety net for unexpected challenges during project execution.</li> <li>- Establish a foundation for precise Work Charge calculations, empowering learners with the skills to accurately estimate and allocate costs, ensuring effective project budget establishment and management.</li> </ul> </li> <li>2. <b>Development</b> (30 minutes) <ul style="list-style-type: none"> <li>a. <b>Factors Influencing Costs Exploration:</b> Conduct an in-depth examination of the myriad factors impacting the Cost of Works, including materials, labor, location, and market conditions. Illustrate the dynamic nature of these influences.</li> <li>b. <b>Decoding Overhead Charges Components:</b> Break down the components of overhead charges, exploring direct and indirect costs. Discuss how these charges contribute</li> </ul> </li> </ol>



	<p>to the overall project expenses and influence budgetary decisions.</p> <p>c. Strategic Contingency Planning Skills: Foster strategic thinking in managing uncertainties by developing contingency planning skills. Guide students to identify potential risks and establish contingency budgets for effective risk mitigation.</p> <p>d. Work Charge Precision Techniques: Equip students with techniques for precise Work Charge establishment, emphasizing accurate calculations and allocation strategies. Illustrate real-world scenarios to enhance practical application skills in project cost estimation.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"> <li>- Provide a project cost breakdown and ask students to identify key cost components and estimate their proportions, encouraging a detailed understanding of cost estimation principles.</li> <li>- Describe a project with potential risks, and task students with estimating contingency budgets to mitigate these risks, promoting awareness of risk management in estimating.</li> </ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"> <li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li> <li>2. Suggested Reading <ul style="list-style-type: none"> <li>- <a href="https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o">https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o</a></li> </ul> </li> <li>3. Homework <ul style="list-style-type: none"> <li>- Research current market trends affecting construction costs. Discuss how these trends influence factors such as material prices, labor availability, and project planning.</li> </ul> </li> </ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"> <li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li> <li>2. Nearpod Quiz on Factors affecting cost of work, overhead charges, contingencies and work charge establishment.</li> </ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 10	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: a. Grasp percentages for diverse building services. b. Examine how percentages vary per service. c. Learn essentials for Detailed Project Report (DPR).
<b>Teaching Aids (if any)</b>	a. Chalk and talk b. Use of Nearpod tool for online quiz
<b>Teaching Development</b>	<ol style="list-style-type: none"><li><b>Introduction (5 minutes)</b><ul style="list-style-type: none"><li>Ask questions. How does accurate estimation contribute to effective resource allocation? Discuss the importance of adapting estimation principles to different project types. How can the principles of estimating be applied in a real-world project scenario? Explain the role of risk assessment in the estimation process.</li></ul></li><li><b>Uncover the intricacies of cost allocation by introducing various percentages associated with distinct building services. Explore how these percentages vary, shaping the financial landscape of construction projects.</b></li><li><b>Dive into the analysis of different services within a building project, understanding the specific percentages applicable to areas such as labor, materials, and overhead charges.</b></li><li><b>Highlight the pivotal role of the Detailed Project Report (DPR) in translating service percentages into a comprehensive document, providing a roadmap for successful project planning, execution, and budgeting.</b></li><li><b>Bridge theory and practice by emphasizing the practical application of service percentages in Detailed Project Report preparation, ensuring students can effectively use this knowledge in real-world cost estimations and budgeting.</b></li></ol> <ol style="list-style-type: none"><li><b>Development (30 minutes)</b><ol style="list-style-type: none"><li><b>Detailed Percentage Analysis:</b> Conduct an in-depth analysis of the various percentages associated with building services, exploring how labor, materials, and overhead charges contribute to the overall project cost.</li><li><b>Scenario-Based Service Allocation:</b> Engage students in scenario-based exercises, allowing them to allocate percentages to different services within a building</li></ol></li></ol>



	<p>project. Foster an understanding of the dynamic nature of cost distribution.</p> <p>c. DPR Components and Structure: Break down the Detailed Project Report (DPR) components and structure, guiding students through the process of integrating service percentages into a comprehensive document that reflects the intricacies of construction planning and budgeting.</p> <p>d. Real-world Application Exercise: Facilitate a practical exercise where students apply various percentages to a hypothetical building project, ensuring they can translate theoretical knowledge into actionable insights for effective cost estimation and project preparation.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Provide a list of building services and ask students to quickly associate the appropriate percentage for each within a 5-minute timeframe, promoting quick thinking and recall.</li><li>- Present a complex project scenario and guide students to analyze and allocate percentages for different services within the DPR. Encourage discussion on strategic decision-making in cost estimation within the 5-minute timeframe.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o">https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Research and compare the percentages allocated to labor, materials, and overhead charges in building projects across different industries. Discuss variations and potential influencing factors.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Various percentages for different services in building, preparation of DPR.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 11	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> <li>a. Explore various methods for accurate estimation.</li> <li>b. Master the art of breaking down work into detailed items for precise estimation.</li> <li>c. Apply estimation techniques to detailed specifications.</li> </ul>
<b>Teaching Aids (if any)</b>	<ul style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ul>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction</b> (5 minutes) <ul style="list-style-type: none"> <li>- Ask questions. How does accurate estimation contribute to effective resource allocation? Discuss the importance of adapting estimation principles to different project types. How can the principles of estimating be applied in a real-world project scenario? Explain the role of risk assessment in the estimation process.</li> <li>- Delve into the essence of precision by emphasizing the correlation between accurate estimates and detailed specifications for each aspect of construction work.</li> <li>- Uncover the diverse methods employed in building estimates, elucidating how each aligns with the intricacies of detailed work specifications to achieve comprehensive and reliable project cost predictions.</li> <li>- Highlight the significance of breaking down project components into detailed items, fostering clarity in understanding and facilitating meticulous estimation practices for a spectrum of construction endeavors.</li> <li>- Bridge theory and practice by stressing the practical application of estimation methods, ensuring students can adeptly navigate the complexities of detailed work specifications for effective cost planning and project execution.</li> </ul> </li> <li>2. <b>Development</b> (30 minutes) <ul style="list-style-type: none"> <li>a. Detailed Specification Emphasis: Emphasize the critical role of detailed work specifications in the accurate estimation of building projects, guiding students to appreciate how specificity enhances precision.</li> <li>b. Estimation Techniques Exploration: Engage students in exploring various estimation techniques tailored to detailed specifications, from quantity takeoff</li> </ul> </li> </ol>



	<p>methods to unit rate and assembly-based approaches.</p> <p>c. Itemized Work Breakdown Mastery: Facilitate a deeper understanding of itemized work breakdowns, providing practical exercises and examples to enhance students' ability to break down complex projects into manageable and estimable components.</p> <p>d. Real-world Application Exercises: Integrate real-world application exercises where students practice building estimates using detailed specifications, reinforcing their capability to apply learned methods to diverse construction scenarios.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Present a detailed work specification and challenge students to estimate the overall project cost within a 5-minute timeframe, promoting quick analysis and decision-making.</li><li>- Provide a set of detailed specifications and ask students to match each with the most appropriate estimation method in a quick 5-minute exercise, reinforcing their understanding of diverse techniques.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- Original NIST Paper on Cloud Computing <a href="https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o">https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Explore and evaluate a construction estimation software tool. Discuss its features and how it aligns with the principles of estimating based on detailed work specifications.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Methods of building estimates w.r.t to detailed specification of each item of work.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



<b>Lesson Plan No. 12</b>	<b>Course Name: Construction Planning and Management</b>	<b>Course No.: CE-603</b>
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<b>Objectives</b>	At the end of the lesson the student shall be able to: a. Explore various methods for accurate estimation. b. Master the art of breaking down work into detailed items for precise estimation. c. Apply estimation techniques to detailed specifications.
<b>Teaching Aids (if any)</b>	a. Chalk and talk b. Use of Nearpod tool for online quiz
<b>Teaching Development</b>	<ol style="list-style-type: none"><li><b>Introduction (5 minutes)</b><ul style="list-style-type: none"><li>Ask questions. How does accurate estimation contribute to effective resource allocation? Discuss the importance of adapting estimation principles to different project types. How can the principles of estimating be applied in a real-world project scenario? Explain the role of risk assessment in the estimation process.</li></ul></li><li><b>Delve into the essence of precision by emphasizing the correlation between accurate estimates and detailed specifications for each aspect of construction work.</b></li><li><b>Uncover the diverse methods employed in building estimates, elucidating how each aligns with the intricacies of detailed work specifications to achieve comprehensive and reliable project cost predictions.</b></li><li><b>Highlight the significance of breaking down project components into detailed items, fostering clarity in understanding and facilitating meticulous estimation practices for a spectrum of construction endeavors.</b></li><li><b>Bridge theory and practice by stressing the practical application of estimation methods, ensuring students can adeptly navigate the complexities of detailed work specifications for effective cost planning and project execution.</b></li></ol> <ol style="list-style-type: none"><li><b>Development (30 minutes)</b><ol style="list-style-type: none"><li><b>Detailed Specification Emphasis:</b> Emphasize the critical role of detailed work specifications in the accurate estimation of building projects, guiding students to appreciate how specificity enhances precision.</li><li><b>Estimation Techniques Exploration:</b> Engage students in exploring various estimation techniques tailored to detailed specifications, from quantity takeoff</li></ol></li></ol>



	<p>methods to unit rate and assembly-based approaches.</p> <p>c. Itemized Work Breakdown Mastery: Facilitate a deeper understanding of itemized work breakdowns, providing practical exercises and examples to enhance students' ability to break down complex projects into manageable and estimable components.</p> <p>d. Real-world Application Exercises: Integrate real-world application exercises where students practice building estimates using detailed specifications, reinforcing their capability to apply learned methods to diverse construction scenarios.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Develop an interactive game where students perform quantity takeoffs for specific items based on detailed specifications, enhancing their ability to translate detailed information into precise estimates within a 5-minute timeframe.</li><li>- Present different construction scenarios with detailed specifications and engage students in a brief discussion on the most suitable estimation method for each, fostering quick decision-making skills.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o">https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Propose an innovative method or tool for building estimates based on detailed specifications. Discuss how this approach could enhance accuracy and efficiency in the estimation process.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Methods of building estimates w.r.t to detailed specification of each item of work.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



<b>Lesson Plan No. 13</b>	<b>Course Name: Construction Planning and Management</b>	<b>Course No.: CE-603</b>
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> <li>a. Mastering the art of estimating.</li> <li>b. Grasping estimation techniques for simplicity.</li> <li>c. Achieving accuracy in complex estimations.</li> </ol>
<b>Teaching Aids (if any)</b>	<ol style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ol>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction (5 minutes)</b> <ul style="list-style-type: none"> <li>- Ask questions. How do you estimate the cost of a masonry platform? What are the key considerations in estimating a single room building? How does the estimation process differ for a two/three-room building compared to a single room? Explain the basics of material takeoff in construction estimation.</li> <li>- Dive into the essential principles of estimating for a masonry platform, unraveling the intricacies of material quantities, labor costs, and associated factors to lay a strong foundation for accurate project budgeting.</li> <li>- Explore the nuances of estimating for a single-room building, emphasizing the specific considerations in quantity takeoff, cost allocation, and method selection to equip learners with practical skills applicable to various construction scenarios.</li> <li>- Transition to more complex estimations for two/three-room buildings, delving into the challenges of multi-room structures. Navigate through detailed specifications, varied material requirements, and nuanced labor considerations to instill confidence in handling diverse project scopes.</li> <li>- Facilitate a seamless integration of theoretical knowledge with hands-on practical application, ensuring students grasp the intricacies of estimating for masonry platforms and buildings of varying complexities for real-world project success.</li> </ul> </li> <li>2. <b>Development (30 minutes)</b> <ol style="list-style-type: none"> <li>a. <b>Masonry Platform Breakdown:</b> Break down the process of estimating masonry platforms, guiding students through the intricacies of calculating materials, labor, and associated costs for a solid understanding.</li> <li>b. <b>Single Room Building Estimation Techniques:</b> Transition to estimating single-room buildings by introducing</li> </ol> </li> </ol>



	<p>specific techniques for accurate quantity takeoff, cost estimation, and addressing potential challenges encountered in this scope.</p> <p>c. Advanced Multi-Room Building Challenges: Navigate the complexities of estimating two/three-room buildings, exploring advanced challenges such as diversified material requirements, spatial considerations, and intricacies in labor allocation. Develop strategies to tackle these complexities effectively.</p> <p>d. Scenario-Based Application Exercises: Reinforce theoretical knowledge with scenario-based exercises, allowing students to practically apply estimation techniques for masonry platforms and buildings. Facilitate discussions on methodology, decision-making, and precision in cost calculations.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Introduce a two/three-room building scenario with varied specifications. Task students to estimate costs efficiently within 5 minutes, emphasizing the importance of precision in complex projects.</li><li>- Provide specifications for a single-room building and instruct students to estimate costs swiftly. Promote quick decision-making regarding material quantities and labor requirements.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o">https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Select two different single-room building projects with varying specifications. Estimate the costs for each and compare the challenges and considerations encountered.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Estimate of masonry platform, single room building, two/three room building estimate</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



<b>Lesson Plan No. 14</b>	<b>Course Name: Construction Planning and Management</b>	<b>Course No.: CE-603</b>
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> <li>a. Mastering the art of estimating.</li> <li>b. Grasping estimation techniques for simplicity.</li> <li>c. Achieving accuracy in complex estimations.</li> </ol>
<b>Teaching Aids (if any)</b>	<ol style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ol>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction (5 minutes)</b> <ul style="list-style-type: none"> <li>- Ask questions. How do you allocate labor costs in the estimation of a construction project? Discuss challenges specific to estimating two/three-room buildings. Why is precision crucial in estimating the cost of a masonry platform? Name two factors that significantly influence cost estimates for building projects.</li> <li>- Dive into the essential principles of estimating for a masonry platform, unraveling the intricacies of material quantities, labor costs, and associated factors to lay a strong foundation for accurate project budgeting.</li> <li>- Explore the nuances of estimating for a single-room building, emphasizing the specific considerations in quantity takeoff, cost allocation, and method selection to equip learners with practical skills applicable to various construction scenarios.</li> <li>- Transition to more complex estimations for two/three-room buildings, delving into the challenges of multi-room structures. Navigate through detailed specifications, varied material requirements, and nuanced labor considerations to instill confidence in handling diverse project scopes.</li> <li>- Facilitate a seamless integration of theoretical knowledge with hands-on practical application, ensuring students grasp the intricacies of estimating for masonry platforms and buildings of varying complexities for real-world project success.</li> </ul> </li> <li>2. <b>Development (30 minutes)</b> <ol style="list-style-type: none"> <li>a. <b>Masonry Platform Breakdown:</b> Break down the process of estimating masonry platforms, guiding students through the intricacies of calculating materials, labor, and associated costs for a solid understanding.</li> <li>b. <b>Single Room Building Estimation Techniques:</b></li> </ol> </li> </ol>





	<p>Transition to estimating single-room buildings by introducing specific techniques for accurate quantity takeoff, cost estimation, and addressing potential challenges encountered in this scope.</p> <p>c. Advanced Multi-Room Building Challenges: Navigate the complexities of estimating two/three-room buildings, exploring advanced challenges such as diversified material requirements, spatial considerations, and intricacies in labor allocation. Develop strategies to tackle these complexities effectively.</p> <p>d. Scenario-Based Application Exercises: Reinforce theoretical knowledge with scenario-based exercises, allowing students to practically apply estimation techniques for masonry platforms and buildings. Facilitate discussions on methodology, decision-making, and precision in cost calculations.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Develop an interactive game where students perform quantity takeoffs for specific items based on detailed specifications, enhancing their ability to translate detailed information into precise estimates within a 5-minute timeframe.</li><li>- Present different construction scenarios with detailed specifications and engage students in a brief discussion on the most suitable estimation method for each, fostering quick decision-making skills.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o">https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o</a></li></ul></li><li>3. Homework Develop budget plans for masonry platforms and single/two/three-room buildings. Discuss how the budgeting approach differs for each scenario and the considerations involved.</li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 15	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: a. Mastering the intricacies of estimating. b. Achieving accuracy in concrete works. c. Bridging theory to practical application.
<b>Teaching Aids (if any)</b>	a. Chalk and talk b. Use of Nearpod tool for online quiz
<b>Teaching Development</b>	<ol style="list-style-type: none"><li><b>Introduction (5 minutes)</b><ul style="list-style-type: none"><li>Ask questions. Name two critical factors influencing the cost estimation of an office building. What are the unique challenges in estimating costs for R.C.C. works? How does spatial design impact the estimation of office building costs? List two key considerations when estimating costs for R.C.C. works.</li><li>Delve into the nuanced process of estimating office buildings, unraveling the complexities of material quantities, labor costs, and spatial considerations for accurate and comprehensive project budgeting.</li><li>Emphasize the significance of precision in estimating Reinforced Concrete Construction (R.C.C.) works. Explore the intricacies of concrete calculations, steel reinforcement, and associated costs to equip learners with the skills required for successful estimation in structural projects.</li><li>Illuminate the practical application of estimation theories in real-world scenarios, fostering a seamless understanding of estimating both office buildings and R.C.C. works for effective project planning and execution.</li></ul></li><li><b>Development (30 minutes)</b><ol style="list-style-type: none"><li><b>Office Building Estimation Strategies:</b> Dive into advanced strategies for estimating office buildings, incorporating factors such as spatial design, finishing details, and specialized construction elements. Guide students through scenario-based exercises to enhance their decision-making skills.</li><li><b>R.C.C. Works Detailed Calculation:</b> Explore the intricacies of Reinforced Concrete Construction (R.C.C.) works with a focus on detailed quantity takeoffs,</li></ol></li></ol>



	<p>concrete mix design, and steel reinforcement calculations. Facilitate hands-on exercises to strengthen students' abilities to calculate precise costs in structural projects.</p> <p>c. Cost Optimization Techniques: Introduce techniques for optimizing costs in both office building and R.C.C. works estimations. Discuss value engineering, material alternatives, and efficient project management strategies to instill a holistic approach to cost-effective construction.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Present a layout of an office building and challenge students to estimate the overall project cost within 5 minutes. Emphasize quick decision-making in spatial design considerations.</li><li>- Provide two different office building scenarios and R.C.C. works projects. Challenge students to compare estimation methods within a 5-minute timeframe, promoting quick analysis and decision-making.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o">https://youtu.be/l4MnlzA3nXc?si=lv339kr2_8HIJU8o</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Investigate a real-world R.C.C. works case study. Estimate the costs for concrete and steel reinforcement, and critically evaluate the factors influencing the estimation.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Estimate of office building, estimate of R.C.C. works.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



<b>Lesson Plan No. 16</b>	<b>Course Name: Construction Planning and Management</b>	<b>Course No.: CE-603</b>
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> <li>a. Mastering the intricacies of estimating.</li> <li>b. Achieving accuracy in concrete works.</li> <li>c. Bridging theory to practical application.</li> </ol>
<b>Teaching Aids (if any)</b>	<ol style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ol>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction (5 minutes)</b> <ul style="list-style-type: none"> <li>- Ask questions. What strategies can be employed to optimize costs in R.C.C. works? In a 5-minute scenario, how would you make quick decisions in estimating an office building's cost? Name one alternative material for concrete in R.C.C. works and discuss its implications. Propose a brief innovative method for enhancing accuracy in the estimation of office building and R.C.C. works costs.</li> <li>- Delve into the nuanced process of estimating office buildings, unraveling the complexities of material quantities, labor costs, and spatial considerations for accurate and comprehensive project budgeting.</li> <li>- Emphasize the significance of precision in estimating Reinforced Concrete Construction (R.C.C.) works. Explore the intricacies of concrete calculations, steel reinforcement, and associated costs to equip learners with the skills required for successful estimation in structural projects.</li> <li>- Illuminate the practical application of estimation theories in real-world scenarios, fostering a seamless understanding of estimating both office buildings and R.C.C. works for effective project planning and execution.</li> </ul> </li> <li>2. <b>Development (30 minutes)</b> <ol style="list-style-type: none"> <li>a. Office Building Estimation Strategies: Dive into advanced strategies for estimating office buildings, incorporating factors such as spatial design, finishing details, and specialized construction elements. Guide students through scenario-based exercises to enhance their decision-making skills.</li> <li>b. R.C.C. Works Detailed Calculation: Explore the intricacies of Reinforced Concrete Construction (R.C.C.) works with a focus on detailed quantity takeoffs,</li> </ol> </li> </ol>



	<p>concrete mix design, and steel reinforcement calculations. Facilitate hands-on exercises to strengthen students' abilities to calculate precise costs in structural projects.</p> <p>c. Cost Optimization Techniques: Introduce techniques for optimizing costs in both office building and R.C.C. works estimations. Discuss value engineering, material alternatives, and efficient project management strategies to in still a holistic approach to cost-effective construction.</p> <p><b>3. Exercise (5 minutes) –</b></p> <ul style="list-style-type: none"><li>- Present a layout of an office building and challenge students to estimate the overall project cost within 5 minutes. Emphasize quick decision-making in spatial design considerations.</li><li>- Provide two different office building scenarios and R.C.C. works projects. Challenge students to compare estimation methods within a 5-minute timeframe, promoting quick analysis and decision-making.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC">https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Research alternative materials for R.C.C. works. Estimate the cost implications of using different materials for concrete and reinforcement, and discuss the potential benefits.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Estimate of office building, estimate of R.C.C. works.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 17	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> <li>a. Mastering accurate estimation techniques.</li> <li>b. Grasping nuances in concrete tank.</li> <li>c. Developing expertise in buried tanks.</li> </ul>
<b>Teaching Aids (if any)</b>	<ul style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ul>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction (5 minutes)</b> <ul style="list-style-type: none"> <li>- Ask questions. Identify three key components to consider when estimating costs for an R.C.C. water tank. List two challenges specific to estimating costs for underground water tanks. Explain the significance of waterproofing in both R.C.C. and underground water tank constructions. Name two materials crucial for the construction of R.C.C. water tanks and discuss their roles.</li> <li>- Delve into the fundamental principles of estimating Reinforced Concrete Construction (R.C.C.) water tanks, emphasizing the intricate calculations of concrete, reinforcement, and associated costs to ensure accurate and comprehensive project budgeting.</li> <li>- Explore the unique considerations in estimating underground water tanks, navigating challenges related to excavation, waterproofing, and structural intricacies. Understanding the nuances of buried tanks is crucial for precise and reliable cost estimation.</li> <li>- Illuminate the practical application of estimation theories in real-world scenarios, fostering a seamless understanding of estimating both R.C.C. and underground water tanks for effective project planning and execution.</li> </ul> </li> <li>2. <b>Development (30 minutes)</b> <ol style="list-style-type: none"> <li>a. R.C.C. Water Tank Calculation Strategies: Delve into advanced strategies for estimating R.C.C. water tanks, covering intricate aspects such as tank dimensions, reinforcement detailing, and waterproofing considerations. Engage students in scenario-based exercises to enhance their analytical skills.</li> <li>b. Underground Tank Estimation Challenges: Explore the challenges specific to estimating underground water tanks, including excavation depths, soil conditions, and</li> </ol> </li> </ol>



	<p>structural requirements. Guide students through practical exercises to develop skills in addressing these challenges effectively.</p> <p>c. Cost Optimization Techniques: Introduce techniques for optimizing costs in both R.C.C. and underground water tank estimations. Discuss value engineering, material alternatives, and efficient project management strategies to instill a holistic approach to cost-effective tank construction.</p> <p>d. Scenario-Based Application Exercises: Facilitate a seamless integration of theoretical knowledge with hands-on practical application. Utilize scenario-based exercises where students estimate R.C.C. and underground water tanks, ensuring a comprehensive understanding of the estimation process in real-world projects.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"> <li>- Present a scenario for an R.C.C. water tank and challenge students to perform a rapid quantity takeoff within 5 minutes. Focus on key elements such as concrete, reinforcement, and waterproofing.</li> </ul> <p>Introduce a real-world scenario involving cost optimization for both R.C.C. and underground water tanks. Task students to brainstorm cost-effective strategies within 5 minutes, emphasizing practical application.</p> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"> <li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li> <li>2. Suggested Reading             <ul style="list-style-type: none"> <li>- <a href="https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC">https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC</a></li> </ul> </li> <li>3. Homework Choose two different R.C.C. water tank projects and two underground water tank projects online. Estimate the costs for each and conduct a comparative analysis, discussing the unique challenges and considerations.</li> </ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"> <li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li> <li>2. Nearpod Quiz on Methods of building estimates w.r.t to detailed specification of each item of work.</li> </ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 18	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: a. Bridging theory to practical application. b. Grasping nuances in concrete tank. c. Developing expertise in buried tanks.
<b>Teaching Aids (if any)</b>	a. Chalk and talk b. Use of Nearpod tool for online quiz
<b>Teaching Development</b>	<ol style="list-style-type: none"><li>1. <b>Introduction (5 minutes)</b><ul style="list-style-type: none"><li>- Ask questions. Suggest one strategy for optimizing costs in the construction of both R.C.C. and underground water tanks. In a 5-minute scenario, what aspects would you prioritize for quick decision-making in estimating water tank costs? Name one alternative construction material that can be considered for both R.C.C. and underground water tanks. Propose a brief innovative technique for enhancing accuracy in the estimation of R.C.C. and underground water tank costs.</li><li>- Delve into the fundamental principles of estimating Reinforced Concrete Construction (R.C.C.) water tanks, emphasizing the intricate calculations of concrete, reinforcement, and associated costs to ensure accurate and comprehensive project budgeting.</li><li>- Explore the unique considerations in estimating underground water tanks, navigating challenges related to excavation, waterproofing, and structural intricacies. Understanding the nuances of buried tanks is crucial for precise and reliable cost estimation.</li><li>- Illuminate the practical application of estimation theories in real-world scenarios, fostering a seamless understanding of estimating both R.C.C. and underground water tanks for effective project planning and execution.</li></ul></li><li>2. <b>Development (30 minutes)</b><ol style="list-style-type: none"><li>a. <b>R.C.C. Water Tank Calculation Strategies:</b> Delve into advanced strategies for estimating R.C.C. water tanks, covering intricate aspects such as tank dimensions, reinforcement detailing, and waterproofing considerations. Engage students in scenario-based exercises to enhance their analytical skills.</li><li>b. <b>Underground Tank Estimation Challenges:</b> Explore the challenges specific to estimating underground water tanks, including excavation depths, soil conditions, and</li></ol></li></ol>



	<p>structural requirements. Guide students through practical exercises to develop skills in addressing these challenges effectively.</p> <p>c. Cost Optimization Techniques: Introduce techniques for optimizing costs in both R.C.C. and underground water tank estimations. Discuss value engineering, material alternatives, and efficient project management strategies to in still a holistic approach to cost-effective tank construction.</p> <p>d. Scenario-Based Application Exercises: Facilitate a seamless integration of theoretical knowledge with hands-on practical application. Utilize scenario-based exercises where students estimate R.C.C. and underground water tanks, ensuring a comprehensive understanding of the estimation process in real-world projects.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"> <li>- Present a scenario for an R.C.C. water tank and challenge students to perform a rapid quantity takeoff within 5 minutes. Focus on key elements such as concrete, reinforcement, and waterproofing.</li> </ul> <p>Introduce a real-world scenario involving cost optimization for both R.C.C. and underground water tanks. Task students to brainstorm cost-effective strategies within 5 minutes, emphasizing practical application.</p> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"> <li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li> <li>2. Suggested Reading             <ul style="list-style-type: none"> <li>- <a href="https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC">https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC</a></li> </ul> </li> <li>3. Homework             <p>Develop budget plans for R.C.C. water tanks and underground water tanks of different sizes. Discuss how the budgeting approach differs for each scenario and the considerations involved.</p> </li> </ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"> <li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li> <li>2. Nearpod Quiz on Methods of building estimates w.r.t to detailed specification of each item of work.</li> </ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 19	Course Name: Construction Planning and Management	Course No.: CE-603
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<b>Objectives</b>	At the end of the lesson the student shall be able to: a. Mastering accurate earthwork estimation techniques b. Grasping detailed road section analysis. c. Bridging theory to practical application.
<b>Teaching Aids (if any)</b>	a. Chalk and talk b. Use of Nearpod tool for online quiz
<b>Teaching Development</b>	<ol style="list-style-type: none"><li><b>Introduction (5 minutes)</b><ul style="list-style-type: none"><li>Ask questions. What are the key elements to consider when analyzing a road section for earthwork estimation? Why is understanding cut and fill crucial in the estimation of earthwork for road construction? How do slope considerations impact the estimation of earthwork quantities from road sections? Identify two common challenges faced in estimating earthwork quantities from road sections.</li><li>Delve into the essential principles of estimating earthwork for road construction, focusing on the intricacies of analyzing road sections, cut and fill calculations, and material quantities for accurate project budgeting.</li><li>Emphasize the significance of sectional analysis in road construction estimation. Explore how dissecting road sections allows for precise determination of cut and fill volumes, aiding in efficient earthwork planning.</li><li>Illuminate the practical application of earthwork estimation theories in real-world scenarios. Foster a seamless understanding of estimating earthwork from road sections, preparing learners for effective decision-making and execution in road construction projects.</li></ul></li><li><b>Development (30 minutes)</b><ol style="list-style-type: none"><li><b>Advanced Sectional Analysis Techniques:</b> Explore advanced techniques in sectional analysis for earthwork estimation, encompassing detailed methods for calculating cut and fill volumes. Engage students in hands-on exercises to enhance their proficiency in interpreting road sections.</li><li><b>Road Design Integration:</b> Integrate road design principles into earthwork estimation, emphasizing the symbiotic relationship between design</li></ol></li></ol>



	<p>specifications and accurate quantity takeoffs. Provide practical insights into aligning earthwork estimates with road design parameters for optimal project outcomes.</p> <p>c. Cut and Fill Optimization Strategies: Delve into strategies for optimizing cut and fill operations, discussing slope considerations, material management, and cost-effective techniques. Guide students through scenario-based exercises to develop skills in minimizing earthwork costs while maintaining project integrity.</p> <p>d. Real-world Application Challenges: Present real-world challenges in earthwork estimation from road sections. Encourage students to analyze and solve these challenges, fostering critical thinking and problem-solving skills essential for successful road construction projects.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Challenge students to perform a rapid cut and fill calculation for a given road section within 5 minutes. Emphasize the importance of quick decision-making in determining earthwork volumes.</li><li>- Provide a road section illustration and task students with an interactive analysis within a 5-minute timeframe. Encourage them to identify key elements affecting earthwork estimation.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC">https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC</a></li></ul></li><li>3. Homework Choose two different road sections with distinct characteristics. Estimate the earthwork quantities for each section and provide a comparative analysis, discussing the impact of section design on earthwork estimation.</li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Estimate of earthwork of road from Section.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



<b>Lesson Plan No. 20</b>	<b>Course Name: Construction Planning and Management</b>	<b>Course No.: CE-603</b>
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<b>Objectives</b>	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> <li>a. Bridging theory to real-world scenarios.</li> <li>b. Exploring earthwork estimation methodologies from road sections.</li> <li>c. Introduction to fundamental concepts and principles.</li> </ul>
<b>Teaching Aids (if any)</b>	<ul style="list-style-type: none"> <li>a. Chalk and talk</li> <li>b. Use of Nearpod tool for online quiz</li> </ul>
<b>Teaching Development</b>	<ol style="list-style-type: none"> <li>1. <b>Introduction</b> (5 minutes) <ul style="list-style-type: none"> <li>- Ask questions. In what ways can real-world scenarios with unexpected challenges impact earthwork estimation from road sections? Provide one example of an alternative material that can be considered in earthwork for road construction. How does the lesson bridge theoretical knowledge with practical application in earthwork estimation? What are the potential benefits of collaborative estimation when estimating earthwork for road construction from sections?</li> <li>- Delve into the essential principles of estimating earthwork for road construction, focusing on the intricacies of analyzing road sections, cut and fill calculations, and material quantities for accurate project budgeting.</li> <li>- Emphasize the significance of sectional analysis in road construction estimation. Explore how dissecting road sections allows for precise determination of cut and fill volumes, aiding in efficient earthwork planning.</li> <li>- Illuminate the practical application of earthwork estimation theories in real-world scenarios. Foster a seamless understanding of estimating earthwork from road sections, preparing learners for effective decision-making and execution in road construction projects.</li> </ul> </li> <li>2. <b>Development</b> (30 minutes) <ul style="list-style-type: none"> <li>a. <b>Advanced Sectional Analysis Techniques:</b> Explore advanced techniques in sectional analysis for earthwork estimation, encompassing detailed methods for calculating cut and fill volumes. Engage students in hands-on exercises to enhance their proficiency in interpreting road sections.</li> <li>b. <b>Road Design Integration:</b> Integrate road design principles into earthwork estimation, emphasizing the symbiotic relationship between design</li> </ul> </li> </ol>



	<p>specifications and accurate quantity takeoffs. Provide practical insights into aligning earthwork estimates with road design parameters for optimal project outcomes.</p> <p>c. Cut and Fill Optimization Strategies: Delve into strategies for optimizing cut and fill operations, discussing slope considerations, material management, and cost-effective techniques. Guide students through scenario-based exercises to develop skills in minimizing earthwork costs while maintaining project integrity.</p> <p>d. Real-world Application Challenges: Present real-world challenges in earthwork estimation from road sections. Encourage students to analyze and solve these challenges, fostering critical thinking and problem-solving skills essential for successful road construction projects.</p> <p>3. Exercise (5 minutes) –</p> <ul style="list-style-type: none"><li>- Introduce real-world scenarios involving earthwork estimation challenges from road sections. Task students to brainstorm solutions within 5 minutes, emphasizing practical application.</li><li>- Organize a collaborative exercise where students work in teams to estimate earthwork from a road section. Encourage rapid discussions and decision-making to enhance teamwork and efficiency within the time constraint.</li></ul> <p>Use Nearpod to collect responses and discuss the answers.</p>
<b>Closure</b>	<ol style="list-style-type: none"><li>1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.</li><li>2. Suggested Reading<ul style="list-style-type: none"><li>- <a href="https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC">https://youtu.be/l4MnlzA3nXc?si=2bbjX0tTArAkNadC</a></li></ul></li><li>3. Homework<ul style="list-style-type: none"><li>- Explore and evaluate innovative estimation tools designed for earthwork estimation from road sections. Discuss their features and potential contributions to enhancing accuracy and efficiency in the estimation process.</li></ul></li></ol> <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
<b>Evaluation</b>	<ol style="list-style-type: none"><li>1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.</li><li>2. Nearpod Quiz on Estimate of earthwork of road from Section.</li></ol> <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>