



Kot Bhalwal, Jammu



Model Institute of Engineering
& Technology (Autonomous)
Dr. Arun K. Gupta Teaching-Learning Centre

Department of CIVIL ENGINEERING

Details of Lesson Plan

S.No.	Particulars	Details
1.	Course Name	PROJECT PLANNING CONTROL AND SYSTEMS
2.	Course Code	CE-701
3.	Academic Year	2024-25
4.	Semester	VII TH
5.	Number of Lesson plans	43
6.	Faculty Assigned	MR ISHAN ANAND

Faculty Signature



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Lesson Plan No. 1	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Define project management and its key concepts. b. Understand the importance of project management in various fields. c. Identify the different phases of a project life cycle.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What is the term used to describe the total work a project entails? (Answer: Scope) True or False: Project management is only relevant for large-scale construction projects. (Answer: False) What is the final stage of a project life cycle typically called? (Answer: Closure)- Start by asking students about projects they've been involved in (school play, group assignment).- Discuss the challenges of managing a project effectively.- Introduce the concept of project management as a structured approach to planning, executing, and controlling projects to achieve specific goals within set constraints.2. Development (30 minutes)<ol style="list-style-type: none">a. Project Definition and Importance:<ul style="list-style-type: none">- Define a project and its key characteristics (temporary, unique objective, defined scope).- Discuss the importance of project management in various fields (business, engineering, IT, event planning).- Briefly mention the benefits of effective project management (increased efficiency, reduced costs, improved quality).b. Project Life Cycle:<ul style="list-style-type: none">- Introduce the concept of a project life cycle with its different phases (Initiation, Planning, Execution, Monitoring & Control, Closure).- Briefly explain each phase and its key activities (defining project goals, creating a project plan, executing tasks, monitoring progress, project completion and handover).3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.<ul style="list-style-type: none">- Divide students into small groups.- Provide a real-world scenario (e.g., organizing a school



	fundraiser) and ask them to identify the different phases of the project life cycle involved.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf3. Homework<ul style="list-style-type: none">- Think of a personal project you'd like to complete (e.g., learning a new skill). Briefly outline the key steps involved in managing this project. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 1	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Define Project Management and its core principles. b. Understand the importance of Project Management in various fields. c. Identify the key elements of successful project execution.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<p>1. Introduction (5 minutes)</p> <ul style="list-style-type: none"> - Ask questions. What is the term used to describe the total work a project entails? (Answer: Scope) True or False: Project Management is only relevant for large-scale construction projects. (Answer: False) What are the three main constraints considered in Project Management? (Answer: Time, Cost, Scope) - Imagine you're planning a party for your friends. What steps would you take to ensure it goes smoothly? - This is a simple example of project management! Project Management applies these same principles to any undertaking, big or small. - In today's lesson, we'll explore what Project Management is and how it helps achieve success. <p>2. Development (30 minutes)</p> <ol style="list-style-type: none"> a. What is Project Management? <ul style="list-style-type: none"> - Define Project Management: A structured approach to planning, executing, controlling, and closing a project to achieve specific goals within defined constraints. - Discuss the Project Management Lifecycle (Initiating, Planning, Executing, Monitoring & Controlling, Closing) b. Why is Project Management Important? <ul style="list-style-type: none"> - Increased efficiency and productivity - Improved communication and collaboration - Reduced risks and better problem-solving - Examples of Project Management in different fields (Construction, Software Development, Event Planning) c. Key Elements of Project Management <ul style="list-style-type: none"> - Setting SMART goals (Specific, Measurable, Achievable, Relevant, Time-bound) - Creating a project plan with timelines and milestones - Managing resources (people, equipment, budget) - Effective communication and stakeholder management



	<p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present a real-world scenario (e.g., organizing a school fundraiser) and ask each group to brainstorm the key steps involved in managing this project.- Have each group share their ideas with the class.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Choose a personal project you'd like to accomplish (e.g., learning a new skill, organizing a sports tournament).- Write down 3-5 key steps you would take to manage this project using the principles discussed in class. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 3	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Identify the key elements that contribute to successful project execution. b. Understand how these elements work together to achieve project goals. c. Explain the importance of each element in managing a project.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What document outlines the overall plan for a project, including timelines and milestones? (Answer: Project Plan) Which element of Project Management focuses on getting the right people with the necessary skills involved in the project? (Answer: Resource Management) True or False: Communication with stakeholders is only important during the planning stage of a project. (Answer: False)- Think about building a house. Many components come together to make a successful project, right? Project management is similar. It involves various elements that work in harmony to achieve a project's goals.- Today, we'll delve into these essential elements and learn how they contribute to a project's success.2. Development (30 minutes)<ul style="list-style-type: none">• The Big Three:<ol style="list-style-type: none">a. Project Scope:<ul style="list-style-type: none">- Define Scope: The total work a project entails, including deliverables and functionalities.- Explain the importance of clearly defining scope to avoid project creep (adding unplanned work).b. Project Schedule:<ul style="list-style-type: none">- Define Schedule: A detailed plan outlining project tasks, timelines, and milestones (key achievements).- Discuss the importance of creating realistic timelines and managing them effectively.c. Project Budget:<ul style="list-style-type: none">- Define Budget: The total financial resources allocated for a project.- Explain the importance of managing costs and staying within budget.• Beyond the Big Three:



	<p>a. Briefly discuss other key elements like:</p> <ul style="list-style-type: none">- Resource Management (people, equipment, materials)- Communication Management (clear communication with stakeholders)- Risk Management (identifying and mitigating potential risks)- Quality Management (ensuring project deliverables meet quality standards) <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a fictional project scenario (e.g., launching a school newspaper).- Ask each pair to identify 2-3 elements from the lesson that would be crucial for managing this project effectively.- Have each pair share their chosen elements and briefly explain their reasoning.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Fundamentals Simplilearn: https://m.youtube.com/watch?v=ZWmXi3TW1yA3. Homework<ul style="list-style-type: none">- Think about a project you've participated in (school play, group assignment). Identify one element of Project Management that was not well-managed and explain how it could have been improved. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 4	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Identify the key elements that contribute to successful project execution. b. Understand the role of planning, resources, and communication in project management. c. Apply these elements to analyze a real-world scenario.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What document outlines the key steps, timelines, and deliverables for a project? (Answer: Project Plan) True or False: Effective communication is only important for large project teams. (Answer: False) What are three types of resources commonly managed in projects? (Answer: People, Equipment, Budget)- Think about a time you successfully completed a group project. What made it go smoothly?- Project Management involves a set of tools and techniques to ensure any undertaking, big or small, is completed on time, within budget, and meets its goals.- Today, we'll delve deeper into the core elements of successful project management.2. Development (30 minutes)<ol style="list-style-type: none">a. Planning: The Roadmap to Success<ul style="list-style-type: none">- Importance of creating a project plan with clear goals, timelines, and deliverables.- Breaking down the project into manageable tasks with assigned responsibilities.- Using tools like Gantt charts or project management software.b. Resource Management: Putting the Pieces Together<ul style="list-style-type: none">- Identifying and allocating human resources (team members) with the necessary skills.- Managing equipment, technology, and any physical resources required.- Creating a budget and monitoring expenses throughout the project.c. Communication: Keeping Everyone on Track<ul style="list-style-type: none">- The importance of clear and consistent communication with all project stakeholders (team, clients, management).- Utilizing communication channels like meetings, emails, or project management platforms.



	<ul style="list-style-type: none">- Establishing conflict resolution strategies for any challenges that arise. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Present a real-world scenario (e.g., launching a new school club).- Individually, have students write down 3 key elements of project management they would consider for this scenario.- Open a class discussion for students to share their ideas and discuss the importance of each element.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Asana: Project Management Basics: https://www.youtube.com/watch?v=uWPIsaYpY7U3. Homework<ul style="list-style-type: none">- Think of a recent project you participated in (school play, group assignment, etc.). Identify one element of project management that could have been improved.- Explain how implementing that improvement would have positively impacted the project's outcome. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 5	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Explore different project management methodologies. b. Understand the strengths and weaknesses of various project management methods. c. Identify the appropriate method for different project types.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What project management method follows a linear, step-by-step approach with minimal flexibility? (Answer: Waterfall) True or False: Agile methodologies are ideal for projects with a constantly evolving scope. (Answer: True) What are two main categories of project management methodologies? (Answer: Traditional vs. Agile)- Imagine you're planning a road trip with friends. Would you have a detailed itinerary or adapt to spontaneous changes?- Project Management methods offer different approaches, just like planning a trip. Today, we'll explore popular methods to see which suits different project needs.2. Development (30 minutes)<ol style="list-style-type: none">a. Traditional Project Management Methods<ul style="list-style-type: none">- Waterfall Method: A structured, sequential approach with well-defined phases (planning, execution, etc.).- Strengths: Clear roadmap, predictable results.- Weaknesses: Inflexible, less adaptable to change.- Suitable for: Well-defined projects with limited scope changes.b. Agile Project Management Methods<ul style="list-style-type: none">- Focuses on iterative development with short cycles (sprints) and continuous improvement.- Strengths: Adaptable to change, promotes collaboration.- Weaknesses: Requires a high degree of team communication and flexibility.- Suitable for: Projects with evolving requirements or a high degree of uncertainty.c. Other Project Management Methods<ul style="list-style-type: none">- Briefly introduce other methods like Scrum, Kanban, or Critical Path Method (CPM) depending on your class level.3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.



	<ul style="list-style-type: none">- Present different project scenarios (e.g., building a website, organizing a school event).- Divide the class into small groups and assign each group a scenario.- Ask each group to discuss which project management method they would recommend and explain their reasoning.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Comparison of Waterfall and Agile Methodologies: https://medium.com/teaching-agile/agile-vs-waterfall-comparing-project-management-approaches-b1d1a7c9c08c3. Homework<ul style="list-style-type: none">- Research a specific project management method (e.g., Agile, Scrum) and create a short presentation summarizing its key features and benefits. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 6	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Explore different project management methodologies. b. Understand the strengths and weaknesses of various project management methods. c. Identify the appropriate method for different project types.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What project management method emphasizes a rigid, step-by-step approach with minimal flexibility? (Answer: Waterfall) True or False: Agile methodologies are best suited for projects with constantly evolving requirements. (Answer: True) What are two main categories of project management methodologies? (Answer: Traditional vs. Agile)- Imagine building a house. Would you have a detailed blueprint or adapt as you go based on discoveries?- Project Management methods offer different approaches, just like building strategies. Today, we'll explore popular methods to see which suits different project needs.2. Development (30 minutes)<ol style="list-style-type: none">a. Traditional Project Management Methods<ul style="list-style-type: none">- Waterfall Method: A structured, sequential approach with well-defined phases (planning, execution, etc.).- Strengths: Clear roadmap, predictable results.- Weaknesses: Inflexible, less adaptable to change.- Suitable for: Well-defined projects with limited scope changes (e.g., construction projects).b. Agile Project Management Methods<ul style="list-style-type: none">- Focuses on iterative development with short cycles (sprints) and continuous improvement.- Strengths: Adaptable to change, promotes collaboration and quick feedback.- Weaknesses: Requires a high degree of team communication and flexibility.- Suitable for: Projects with evolving requirements, a high degree of uncertainty, or software development.c. Other Project Management Methods<ul style="list-style-type: none">- Briefly introduce other methods like Scrum (a specific Agile framework), Kanban (visualizes workflow), or Critical Path Method (CPM) depending on your class level.



	<p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Present different project scenarios on a whiteboard or projector (e.g., launching a marketing campaign, designing a new product).- Divide the class into small groups and assign each group a scenario.- Ask each group to discuss:<ul style="list-style-type: none">• Which project management method they would recommend?• Explain their reasoning based on the method's strengths and the project's characteristics.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Atlassian: Agile vs Waterfall Project Management https://www.youtube.com/watch?v=5RocT_OdQcA3. Homework<ul style="list-style-type: none">- Research a specific project management method (e.g., Scrum, Kanban) that interests you.- Create a short infographic or presentation summarizing its key features and benefits. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 7	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Define a Work Breakdown Structure (WBS) and its role in project management. b. Understand the key elements and benefits of using a WBS. c. Apply the WBS concept to break down a project into manageable tasks.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What is the main purpose of a Work Breakdown Structure? (Answer: To break down a project into smaller, manageable tasks) True or False: A WBS should only be used for large and complex projects. (Answer: False) What are two main characteristics of a well-defined WBS element? (Answer: Mutually exclusive (no overlap) and collectively exhaustive (covers all work))- Imagine building a house. How would you break down this large project into smaller, more manageable steps?- A Work Breakdown Structure (WBS) is a similar tool used in project management to organize and define all the work required to complete a project.2. Development (30 minutes)<ol style="list-style-type: none">a. What is a Work Breakdown Structure (WBS)?<ul style="list-style-type: none">- Define a WBS as a hierarchical outline that breaks down a project into deliverable-oriented components.- Explain the WBS as a tree-like structure, with the overall project at the top and progressively smaller tasks branching out below.- Discuss the benefits of using a WBS: improved project planning, better resource allocation, and clearer communication.b. Elements of a WBS<ul style="list-style-type: none">- Describe the importance of clear and concise task descriptions at each level of the WBS.- Explain the concept of "mutually exclusive" tasks (no overlap in responsibility) and "collectively exhaustive" (covers all necessary work).- Discuss the use of work packages at the lowest level, which are clearly defined tasks assigned to specific individuals or teams.c. Applying the WBS



	<ul style="list-style-type: none">- Provide a real-world example of a project (e.g., launching a school website)- Walk students through the process of creating a WBS for this example, starting with the overall project goal and progressively breaking it down into smaller tasks. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present a different project scenario (e.g., organizing a school bake sale).- Ask each group to brainstorm and create a simple WBS for the chosen project, outlining the main tasks involved.- Have each group present their WBS structure to the class.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Work Breakdown Structure: A Guide: https://asana.com/resources/work-breakdown-structure3. Homework<ul style="list-style-type: none">- Choose a personal project you're currently working on (e.g., learning a new skill, planning a birthday party).- Develop a basic WBS for your project, outlining at least 3-5 key tasks involved in completing it. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 8	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the concept of a Work Breakdown Structure (WBS) in project management. Explain the benefits of using a WBS for project planning. Develop a basic WBS for a simple project scenario.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What is the primary purpose of a Work Breakdown Structure? (Answer: To break down a project into smaller, manageable tasks)</p> <p>True or False: A WBS should only include major project milestones. (Answer: False)</p> <p>What are two key characteristics of a well-defined WBS element? (Answer: Mutually exclusive - tasks don't overlap; Collectively exhaustive - includes all necessary tasks)</p> Imagine building a Lego model. How would you approach it? Breaking it down into smaller steps, right? A Work Breakdown Structure (WBS) does the same thing for projects! Today, we'll learn how a WBS helps us organize and manage complex projects. Development (30 minutes) <ol style="list-style-type: none"> What is a WBS? <ul style="list-style-type: none"> Define a WBS: A hierarchical outline that breaks down a project into deliverable components. Explain the WBS as a visual tool (tree structure) representing project elements. Discuss the importance of breaking down tasks to a manageable level. Benefits of Using a WBS <ul style="list-style-type: none"> Improved project planning and clarity. Enhanced communication and stakeholder understanding. Better resource allocation and risk identification. Simpler project monitoring and control. Creating a WBS <ul style="list-style-type: none"> Explain the top-down approach: Start with the overall project goal and break it down into phases, deliverables, and tasks. Emphasize the importance of clear and concise task descriptions. Discuss the concept of a "work package" - the lowest level of a WBS that can be independently assigned and completed.



	<p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Present a simple project scenario (e.g., planning a class picnic).- Divide the class into small groups and have them create a basic WBS for this project.- Each group should identify key phases, tasks, and deliverables.
Closure	<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">- Work Breakdown Structure (WBS) Explained: https://asana.com/resources/work-breakdown-structure <p>3. Homework</p> <ul style="list-style-type: none">- Choose a personal project you're currently working on (e.g., studying for an exam, organizing a room cleanup).- Develop a simple WBS outlining the key steps involved in completing this project. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<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. 9	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of networks in project management. b. Identify different types of network relationships between project tasks. c. Apply network principles to analyze a simple project schedule.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What is the main benefit of using network scheduling techniques in project management? (Answer: To visualize task dependencies and identify the critical path) True or False: All project tasks must be linked together in a network diagram. (Answer: False) What are two common types of network relationships between tasks? (Answer: Finish-to-Start (FS) and Start-to-Start (SS))- Imagine building a house. Can the roof be installed before the walls are built?- Project tasks often depend on each other. Network diagrams help us visualize these relationships and plan project schedules effectively.2. Development (30 minutes)<ol style="list-style-type: none">a. Introduction to Network Scheduling<ul style="list-style-type: none">- Define network scheduling: A technique for visualizing project tasks and their dependencies.- Explain the use of network diagrams with nodes (tasks) and arrows (relationships).- Discuss the importance of identifying the critical path - the longest sequence of dependent tasks that determines project duration.b. Types of Network Relationships<ul style="list-style-type: none">- Introduce common relationships like Finish-to-Start (FS): Successor task cannot begin until predecessor finishes.- Discuss Start-to-Start (SS): Both tasks can begin simultaneously.- Briefly mention other relationships like Finish-to-Finish (FF) depending on your class level.c. Network Analysis Techniques<ul style="list-style-type: none">- Explain the concept of Early Start (ES) and Early Finish (EF) times for each task based on network dependencies.- Introduce the concept of Late Start (LS) and Late Finish (LF) times to identify schedule float (slack) for non-critical tasks..



	<p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Present a simplified project scenario with a few interdependent tasks (e.g., car wash fundraiser).- Provide a template with blank nodes and arrows for a network diagram.- Ask students to work individually to map the tasks and their dependencies using arrows and identify the critical path.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Research a specific project management software tool used for network scheduling (e.g., Microsoft Project, Primavera P6).- Create a short presentation summarizing the key features of the software and how it helps with network scheduling. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 10	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the concept of project networks and their role in scheduling. Identify different types of network relationships between project tasks. Apply network fundamentals to create a simple project schedule using a network diagram.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What is the main benefit of using network scheduling techniques in project management? (Answer: To visualize task dependencies and create an optimal project schedule)</p> <p>True or False: All project tasks have to be completed sequentially (one after another). (Answer: False)</p> <p>What are two common methods for representing project networks? (Answer: Precedence Diagramming Method (PDM) or Arrow Diagramming Method (ADM))</p> Imagine planning a road trip with multiple stops. How would you decide the order and timing of your visits? Project networks are similar! They help us visualize task dependencies and create efficient project schedules. Today, we'll explore the basics of network scheduling. Development (30 minutes) <ol style="list-style-type: none"> What are Project Networks? <ul style="list-style-type: none"> Define project networks: A graphical representation of project tasks and their dependencies. Explain how networks show the relationships between tasks (finish-to-start, start-to-start, etc.). Discuss the importance of networks for identifying the critical path (longest sequence of dependent tasks) in a project. Types of Network Relationships <ul style="list-style-type: none"> Introduce common relationships between tasks: Finish-to-Start (FS), Start-to-Start (SS), Finish-to-Finish (FF), Start-to-Finish (SF). Explain how arrows and nodes represent tasks and dependencies in a network diagram. Provide examples of each relationship using real-world project scenarios.



	<p>c. Creating a Simple Network Diagram</p> <ul style="list-style-type: none">- Introduce the concept of creating a network diagram using a specific method (e.g., Precedence Diagramming Method).- Walk through the steps of identifying tasks, dependencies, and creating a visual network for a simple project.- Discuss the use of software tools like Microsoft Project for creating complex network diagrams. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Present a short project scenario with a few well-defined tasks (e.g., painting a room).- Ask students to identify the tasks and their dependencies (e.g., buy paint - FS - apply primer).- Have students work individually to sketch a simple network diagram for this project.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Choose a real-world project you're familiar with (e.g., organizing a school event, completing a household chore).- Identify 5-7 key tasks involved and analyze their dependencies.- Sketch a basic network diagram representing these tasks and their relationships. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 1	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the key elements and conventions for drawing project network diagrams. Apply these rules to create a basic network diagram for a sample project. Identify the importance of clear and accurate network diagrams in project scheduling.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What visual element in a network diagram represents a project activity? (Answer: Node or Box)</p> <p>True or False: Arrows in a network diagram always indicate the flow of time. (Answer: True)</p> <p>What does the critical path in a network diagram represent? (Answer: The longest sequence of dependent tasks that determines project duration)</p> Imagine a roadmap for a road trip. It shows locations and the order you visit them. Project network diagrams are similar! Today, we'll learn the rules for drawing these diagrams, which are crucial for project scheduling. Development (30 minutes) <ol style="list-style-type: none"> Elements of a Network Diagram <ul style="list-style-type: none"> Introduce the basic building blocks of a network diagram: <ul style="list-style-type: none"> Nodes (or boxes): Represent project activities or tasks. Arrows: Indicate the logical relationships and flow of dependencies between tasks. Labels: Describe task names, durations, or other relevant information. Discuss the importance of using standardized symbols and conventions for clarity. Rules for Drawing Network Diagrams <ul style="list-style-type: none"> Present key rules for creating accurate network diagrams: <ul style="list-style-type: none"> Define the project scope and identify all major activities. Establish task dependencies (FS, SS, etc.) and sequence them logically. Use arrows to connect dependent tasks, with the arrow pointing to the successor task. Avoid creating loops or disconnected elements in the network.



	<ul style="list-style-type: none">- Emphasize the importance of clear labeling for tasks and their durations.c. Benefits of Clear Network Diagrams<ul style="list-style-type: none">- Discuss the advantages of using well-drawn network diagrams:<ul style="list-style-type: none">• Improved communication and understanding of project tasks and dependencies.• Enhanced ability to visualize the critical path and identify potential bottlenecks.• More efficient project scheduling and resource allocation.3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.<ul style="list-style-type: none">- Provide a simple project scenario with a few well-defined tasks (e.g., washing a car).- Divide the class into small groups.- Ask each group to follow the network drawing rules to create a basic network diagram for the project.- Have each group present their diagram and explain the reasoning behind their connections and chosen relationships.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a recent project you participated in (school play, group assignment, etc.).- List down 5-7 key tasks involved in the project.- Following the network drawing rules, sketch a simple network diagram representing these tasks and their dependencies (FS, SS, etc.). <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 1	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the concepts of deterministic and probabilistic approaches to project scheduling. b. Identify the strengths and weaknesses of each approach. c. Apply these concepts to choose the appropriate scheduling approach for a given project scenario.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What is the main characteristic of a deterministic approach to project scheduling? (Answer: Assumes fixed estimates for task durations) True or False: Probabilistic approaches are always more complex and time-consuming to implement. (Answer: True) When might a project manager prefer a probabilistic approach to scheduling? (Answer: When there's high uncertainty about project variables like task durations)- Imagine planning a road trip. How certain are you about the travel time for each leg?- Project scheduling faces similar challenges! Today, we'll explore two approaches to handle uncertainty in project timelines.2. Development (30 minutes)<ol style="list-style-type: none">a. Deterministic Approach<ul style="list-style-type: none">- Define the deterministic approach: A method that assumes fixed and exact estimates for project task durations.- Explain the benefits of this approach: Simplicity, ease of use, clear project roadmap.- Discuss the limitations of determinism: Ignores potential variations in task durations, may lead to unrealistic schedules.b. Probabilistic Approach<ul style="list-style-type: none">- Define the probabilistic approach: A method that considers the likelihood of different durations for project tasks.- Introduce statistical tools like PERT (Program Evaluation and Review Technique) used for probabilistic scheduling.- Discuss the advantages of probabilism: Accounts for uncertainty, provides a more realistic view of project timelines.- Mention the potential drawbacks: Complexity, requires additional data and calculations.c. Choosing the Right Approach<ul style="list-style-type: none">- Emphasize the importance of selecting the appropriate



	<p>scheduling approach based on project characteristics.</p> <ul style="list-style-type: none">- Discuss factors to consider: Project complexity, level of uncertainty, data availability, and project management expertise.- Provide examples of when each approach might be preferable (e.g., deterministic for simple projects, probabilistic for complex projects with high uncertainty). <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Present two short project scenarios with different characteristics (e.g., scheduling a routine maintenance task vs. launching a new product).- Divide the class into pairs.- Ask each pair to discuss which scheduling approach (deterministic or probabilistic) would be more suitable for each scenario and explain their reasoning.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a real-world project you're familiar with (school event, personal project).- Analyze the level of uncertainty involved in estimating task durations for this project.- Would you recommend a deterministic or probabilistic approach for scheduling this project? Explain your answer. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 18	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the concepts of deterministic and probabilistic approaches to project scheduling. b. Identify the strengths and weaknesses of each approach. c. Discuss scenarios where each approach is most suitable for project planning..
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What is the key characteristic of a deterministic approach to project scheduling? (Answer: Assumes fixed estimates for project activities) True or False: Probabilistic approaches completely eliminate uncertainty in project timelines. (Answer: False) What is an example of a project where a probabilistic approach might be beneficial? (Answer: Software development project with inherent uncertainty in task durations)- Imagine planning a road trip. How certain are you about the exact travel time?- Project scheduling faces similar challenges! Today, we'll explore two approaches to handle uncertainty: deterministic and probabilistic.2. Development (30 minutes)<ol style="list-style-type: none">a. Deterministic Approach<ul style="list-style-type: none">- Define the deterministic approach: Scheduling based on single-point estimates for activity durations.- Explain the use of Critical Path Method (CPM) as a common deterministic technique.- Discuss the advantages of this approach: Simplicity, ease of use, clear project roadmap.- Highlight the limitations of determinism: Ignores inherent uncertainties, can lead to unrealistic timelines.b. Probabilistic Approach<ul style="list-style-type: none">- Define the probabilistic approach: Scheduling that considers the likelihood of variations in activity durations.- Introduce techniques like Program Evaluation and Review Technique (PERT) that use probability distributions.- Discuss the benefits of this approach: More realistic project timelines, better risk management.- Acknowledge the challenges of probabilism: Complexity, requires more data and expertise.



	<p>c. Choosing the Right Approach</p> <ul style="list-style-type: none">- Discuss factors to consider when selecting a scheduling approach:<ul style="list-style-type: none">• Project complexity and uncertainty level.• Availability of historical data and project manager's experience.• Project's tolerance for schedule deviations.- Emphasize that both approaches have value and can be used strategically depending on the project context. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present two short project scenarios (one simple, one complex) with a few tasks each (e.g., planning a class picnic vs. launching a new product).- Ask each pair to identify which approach (deterministic or probabilistic) would be more suitable for each scenario and explain their reasoning.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on (e.g., studying for an exam, completing a creative project).- Analyze the level of uncertainty involved in completing this project.- Would you consider using a deterministic or probabilistic approach to estimate your project timeline? Explain your reasoning. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 19	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the concepts of deterministic and probabilistic approaches to project scheduling. b. Identify the strengths and weaknesses of each approach. c. Apply these concepts to choose the appropriate approach for different project scenarios..
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What is the key characteristic of a deterministic approach to project scheduling? (Answer: Assumes fixed estimates for project tasks) True or False: Probabilistic approaches completely eliminate uncertainty in project timelines. (Answer: False) What is an advantage of using a probabilistic approach to project scheduling? (Answer: Allows for considering risks and potential variations in project duration)- Imagine planning a road trip. Can you predict exactly how long it will take with traffic and unexpected stops?- Project scheduling faces similar challenges! Today, we'll explore two approaches to handle uncertainty: deterministic and probabilistic.2. Development (30 minutes)<ol style="list-style-type: none">a. Deterministic Approach<ul style="list-style-type: none">- Define the deterministic approach: Scheduling based on single-point estimates for activity durations (e.g., Critical Path Method - CPM).- Discuss the advantages of this approach: Simplicity, ease of use, clear project roadmap.- Highlight the limitations of determinism: Ignores potential variations in task durations, doesn't account for risks and uncertainties.b. Probabilistic Approach<ul style="list-style-type: none">- Introduce the probabilistic approach: Scheduling that considers the likelihood of different durations for project activities (e.g., Program Evaluation and Review Technique - PERT).- Explain how this approach uses probability distributions (e.g., optimistic, pessimistic, most likely durations) to estimate project timelines.- Discuss the benefits of probabilism: More realistic project



	<p>timelines, allows for risk assessment and contingency planning.</p> <p>c. Choosing the Right Approach</p> <ul style="list-style-type: none">- Emphasize that the best approach depends on the project's characteristics:• Deterministic approach is suitable for well-defined projects with low uncertainty.• Probabilistic approach is better for complex projects with high uncertainty or significant risks. <p>3. Exercise (5 minutes) –</p> <p>Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Present two short project scenarios (one with high uncertainty, one with low uncertainty). (e.g., Planning a class picnic vs. Building a model bridge)- Divide the class into pairs.- Ask each pair to discuss which approach (deterministic or probabilistic) would be more appropriate for each scenario and explain their reasoning.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Deterministic vs. Probabilistic Project Scheduling: https://pmhut.com/3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on (e.g., studying for an exam, organizing a room cleanup).- Analyze the level of uncertainty involved in this project.- Based on your analysis, decide whether a deterministic or probabilistic approach would be more suitable for scheduling your project tasks. Explain your reasoning. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 20	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the key differences between deterministic and probabilistic approaches to project planning. Identify the strengths and weaknesses of each approach. Apply the appropriate approach based on project characteristics.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What does a deterministic approach in project planning assume about project durations and costs? (Answer: Fixed and predictable)</p> <p>True or False: Probabilistic approaches are always more accurate than deterministic approaches. (Answer: False)</p> <p>What is a key benefit of using a probabilistic approach in project planning? (Answer: Takes uncertainty into account and provides a risk assessment)</p> Imagine planning a trip. Can you predict every detail like traffic delays or weather changes? Project planning faces similar challenges! Today, we'll explore two approaches: deterministic (fixed estimates) and probabilistic (considers uncertainty). Development (30 minutes) <ol style="list-style-type: none"> Deterministic Approach <ul style="list-style-type: none"> Define the deterministic approach: Relies on single-point estimates for project duration, cost, and resources. Explain the benefits of this approach: Simple, easy to understand, suitable for well-defined projects with minimal uncertainty. Discuss the limitations of this approach: Ignores potential risks and delays, may lead to unrealistic expectations. Probabilistic Approach <ul style="list-style-type: none"> Define the probabilistic approach: Uses statistical methods to consider uncertainties and develop range estimates for project variables. Introduce key tools like PERT (Program Evaluation and Review Technique) that use probability distributions to assess project risks. Highlight the benefits of this approach: More realistic project plans, better risk management, and improved contingency planning. Choosing the Right Approach



	<ul style="list-style-type: none">- Discuss factors to consider when choosing between deterministic and probabilistic approaches:<ul style="list-style-type: none">● Project complexity and level of uncertainty.● Availability of historical data for risk assessment.● Project budget and resource constraints.- Emphasize the importance of selecting the approach that best suits the specific project characteristics. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present two different project scenarios (e.g., organizing a school event, launching a new product).- One scenario should be well-defined with minimal uncertainty (e.g., school event).- The other scenario should involve more complexity and uncertainty (e.g., product launch).- Ask each pair to discuss which approach (deterministic or probabilistic) would be more suitable for each scenario and explain their reasoning.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on.- Identify whether your approach to planning this project is more deterministic or probabilistic.- Explain your reasons for choosing this approach and discuss how the other approach could be beneficial for this project (if applicable). <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 21	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the concepts of deterministic and probabilistic approaches in project planning. b. Identify the strengths and weaknesses of each approach. c. Discuss when to use each approach for effective project management.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does a deterministic approach in project planning assume about project timelines and costs? (Answer: They are fixed and predictable) True or False: Probabilistic approaches are always more accurate than deterministic approaches. (Answer: False) What is a key benefit of using a probabilistic approach in project management? (Answer: It considers potential risks and uncertainties for a more realistic project plan)- Imagine planning a road trip. Can you predict every traffic jam or unexpected stop?- Project planning faces similar challenges! Today, we'll explore two approaches for managing project timelines and costs: deterministic and probabilistic.2. Development (30 minutes)<ol style="list-style-type: none">a. Deterministic Approach<ul style="list-style-type: none">- Define the deterministic approach: Assumes project durations and costs are fixed and predictable.- Explain how this approach uses single-point estimates for time and cost elements.- Discuss the advantages of a deterministic approach: Simplicity, ease of use, clear communication of goals.- Highlight the limitations of this approach: Ignores potential risks and uncertainties, can lead to unrealistic project plans.b. Probabilistic Approach<ul style="list-style-type: none">- Define the probabilistic approach: Considers the likelihood of different outcomes for project durations and costs.- Introduce statistical tools like PERT (Program Evaluation and Review Technique) used in this approach.- Discuss the benefits of a probabilistic approach: More realistic project plans, better risk identification and mitigation.- Acknowledge the complexity of this approach: Requires more



	<p>data analysis and expertise in using statistical tools.</p> <p>c. Choosing the Right Approach</p> <ul style="list-style-type: none">- Discuss when to use each approach:• Deterministic approach: Suitable for well-defined projects with low complexity and minimal uncertainty.• Probabilistic approach: More beneficial for complex projects with higher risks and uncertainties.- Emphasize the importance of considering project characteristics and available information when choosing an approach. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present two short project scenarios (one simple, one complex) with different levels of uncertainty.- Ask each group to discuss which approach (deterministic or probabilistic) would be more suitable for each scenario and explain their reasoning.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on (e.g., studying for an exam, organizing a social event).- Analyze the level of uncertainty associated with this project.- Explain if a deterministic or probabilistic approach would be more suitable for planning this project and justify your answer. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 22	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the concept of PERT and its use for project time estimation. Explain the three-time estimates used in PERT (optimistic, most likely, pessimistic). Calculate the expected time (average duration) for a project activity using PERT.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What does PERT stand for? (Answer: Program Evaluation and Review Technique)</p> <p>True or False: PERT only uses one time estimate for each project activity. (Answer: False)</p> <p>What does the expected time in PERT represent? (Answer: The average duration of a project activity considering potential variations)</p> Imagine planning a project with uncertain task durations. How can we account for these variations? PERT helps us address this challenge! Today, we'll learn about time estimates in PERT for more realistic project scheduling. Development (30 minutes) <ol style="list-style-type: none"> Introduction to PERT <ul style="list-style-type: none"> Briefly introduce PERT as a project management tool for scheduling and risk analysis. Explain how PERT uses a network diagram similar to the Critical Path Method (CPM). PERT Time Estimates <ul style="list-style-type: none"> Define the three time estimates used in PERT for each activity: <ul style="list-style-type: none"> Optimistic Time (T_o): The shortest possible time an activity can be completed under ideal conditions. Most Likely Time (T_m): The most realistic estimate of an activity's duration considering normal circumstances. Pessimistic Time (T_p): The longest possible time an activity might take due to unforeseen delays or problems. Calculating Expected Time (TE) <ul style="list-style-type: none"> Introduce the formula for calculating the expected time (TE) of a project activity in PERT: <ul style="list-style-type: none"> $TE = (T_o + 4T_m + T_p) / 6$



	<ul style="list-style-type: none">- Explain the logic behind weighting the most likely time more heavily in the calculation.- Provide examples of calculating expected times for different scenarios. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present each pair with a short project scenario containing a few activities (e.g., planning a class presentation).- Ask each pair to estimate optimistic, most likely, and pessimistic times for each activity.- Have each pair calculate the expected time (TE) for each activity using the PERT formula.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Choose a real-world project you're familiar with (e.g., completing a household chore, organizing a club event).- Identify 3-5 key activities involved in the project.- For each activity, estimate the optimistic, most likely, and pessimistic times it might take to complete.- Calculate the expected time (TE) for each activity using the PERT formula. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 23	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the concept of frequency distribution curves and their application in project management. Identify different types of probability distribution curves relevant to PERT. Explain how probability distributions are used to calculate project completion time variability in PERT.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What does a frequency distribution curve show in project management? (Answer: The spread of possible durations for a project activity)</p> <p>True or False: All project activities in PERT are assumed to have the same probability of taking a specific amount of time. (Answer: False)</p> <p>What is the main benefit of using probability distributions in PERT? (Answer: To account for the likelihood of variations in project activity durations)</p> Imagine estimating how long it might take to complete a task. How confident are you about that exact time? PERT uses probability distributions to address this challenge! Today, we'll explore how these curves help us understand variations in project timelines. Development (30 minutes) <ol style="list-style-type: none"> Frequency Distribution Curves <ul style="list-style-type: none"> Define frequency distribution curves: Visual representations of how often different values (durations) occur in a data set. Explain how these curves help us understand the spread and likelihood of different project activity durations. Discuss the concept of central tendency (average) and dispersion (spread) in frequency distributions. Probability Distributions in PERT <ul style="list-style-type: none"> Introduce the concept of probability distributions: Mathematical models that depict the likelihood of different outcomes (durations) for a random variable (project activity). Focus on the Beta distribution, commonly used in PERT due to its ability to model optimistic, most likely, and pessimistic estimates. Explain how the PERT formula ($TE = (T_o + 4T_m + T_p) / 6$) relates to the Beta distribution's parameters.



	<p>c. Using Probability Distributions for Project Variability</p> <ul style="list-style-type: none">- Discuss how probability distributions allow us to calculate the probability of a project finishing within a specific timeframe.- Explain the concept of critical path variability in PERT and how it considers the uncertainties of all activities.- Emphasize the importance of using probability distributions for more realistic project scheduling and risk mitigation. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present a simplified PERT scenario with a few activities and their estimated optimistic, most likely, and pessimistic times.- Ask each group to imagine these estimates represent possible durations for one activity and sketch a hypothetical frequency distribution curve.- Have each group discuss how this curve reflects the variability of the activity's duration.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- A Guide to Probability Distributions in PERT: https://m.youtube.com/watch?v=1h07Crnx2ek3. Homework<ul style="list-style-type: none">- Research the concept of standard deviation in probability distributions.- Explain how standard deviation is used in conjunction with the expected time (TE) in PERT to understand the range of possible project completion times. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 24	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the concept of frequency distribution curves and their types. Explain how probability distribution curves relate to PERT time estimates. Apply basic knowledge of probability distributions to interpret PERT calculations.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What does a frequency distribution curve show? (Answer: The distribution of data points across a range of values)</p> <p>True or False: All probability distributions have a bell-shaped curve. (Answer: False)</p> <p>How does PERT leverage the concept of probability distributions for time estimates? (Answer: PERT considers the likelihood of different durations for project activities)</p> Imagine flipping a coin - how likely is it to land on heads or tails? Probability helps us understand such uncertainties. PERT uses a similar concept! Today, we'll explore frequency distribution curves and how they relate to project time estimation in PERT. Development (30 minutes) <ol style="list-style-type: none"> Frequency Distribution Curves <ul style="list-style-type: none"> Define frequency distribution curves: A graphical representation of how data points are distributed across a range of values. Introduce common types of frequency distribution curves (e.g., bell-shaped curve, skewed curve, uniform distribution). Explain how these curves visually represent the likelihood of different outcomes within a data set. Probability Distributions in PERT <ul style="list-style-type: none"> Relate the concept of frequency distribution to PERT time estimates. Explain how PERT uses three time estimates (optimistic, most likely, pessimistic) to create a probability distribution for activity durations. Discuss how the PERT formula ($TE = (T_o + 4T_m + T_p) / 6$) considers the likelihood of different durations based on these estimates. Interpreting PERT Calculations



	<ul style="list-style-type: none">- Emphasize that the expected time (TE) in PERT represents the average duration, not a guaranteed timeframe.- Explain how the probability distribution allows for considering potential variations in activity durations.- Provide examples of how to interpret PERT calculations in the context of project scheduling and risk analysis. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present a scenario with a simple project activity (e.g., writing a short essay).- Ask each group to brainstorm optimistic, most likely, and pessimistic times for completing this activity.- Have each group discuss how these estimates could be visualized using a frequency distribution curve.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- A Guide to Probability Distributions in PERT: https://m.youtube.com/watch?v=1h07Cmrx2ek3. Homework<ul style="list-style-type: none">- Research a real-world project (construction project, software development, etc.).- Find an example of how PERT is used for time estimation in such projects.- Explain how the concept of probability distribution applies to the PERT calculations presented in your chosen example. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 25	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the concept of frequency distribution curves and their types. Explain how probability distributions relate to project activity durations in PERT. Apply the concept of Beta distribution to interpret PERT time estimates.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What does a frequency distribution curve show? (Answer: The distribution of data points across a range of values)</p> <p>True or False: All probability distributions have the same shape. (Answer: False)</p> <p>What does the Beta distribution used in PERT represent? (Answer: The probability of an activity's duration falling within a range based on optimistic, most likely, and pessimistic estimates)</p> Imagine a class full of students. How tall might they be? A histogram can help visualize this spread. PERT uses a similar concept! Today, we'll explore probability distributions to understand variations in project activity durations. Development (30 minutes) <ol style="list-style-type: none"> Frequency Distribution Curves <ul style="list-style-type: none"> Define frequency distribution curves: A graphical representation of how data points are distributed across a range of values. Introduce common types of frequency distributions (e.g., bell curve, skewed distributions). Explain how these curves help visualize the spread and central tendency of data. Probability Distributions in PERT <ul style="list-style-type: none"> Discuss how PERT uses probability distributions to account for uncertainties in project activity durations. Introduce the concept of the Beta distribution as the specific probability distribution used in PERT. Beta Distribution and PERT Estimates <ul style="list-style-type: none"> Explain how the Beta distribution considers the optimistic



	<p>(T_o), most likely (T_m), and pessimistic (T_p) time estimates in PERT.</p> <ul style="list-style-type: none">- Discuss how the Beta distribution assigns probabilities to different possible durations for an activity.- Provide an example of interpreting the Beta distribution based on a sample PERT calculation. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Briefly review the PERT time estimates (optimistic, most likely, pessimistic) from the previous lesson.- Provide each pair with a hypothetical scenario where they've already calculated these estimates for an activity.- Ask each pair to visualize (sketch) a possible Beta distribution curve for this activity, considering the PERT estimates.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Beta Distribution: https://en.wikipedia.org/wiki/Beta_distribution3. Homework<ul style="list-style-type: none">- Recall a recent project you participated in (school project, group activity).- Focus on one specific activity within that project that had some uncertainty in its duration.- Try to estimate optimistic, most likely, and pessimistic times for this activity (even if approximate).- Explain how a Beta distribution curve might represent the probability of the actual duration falling within a range based on these estimates. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 26	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the basic concept of the Central Limit Theorem (CLT) and its significance in statistics. b. Grasp the first statement of the CLT, which describes the distribution of sample means. c. Recognize the applicability of the CLT in various scenarios involving sampling.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the Central Limit Theorem (CLT) describe in statistics? (Answer: The distribution of sample means) True or False: The CLT applies only to samples drawn from normally distributed populations. (Answer: False) If you repeatedly take large, random samples from any population, what does the CLT tell you about the distribution of the sample means? (Answer: It tends to become normally distributed regardless of the original population's distribution)- Imagine flipping a coin 10 times. What are the possible outcomes? Now, imagine flipping it 100 times. How might the results differ?- The Central Limit Theorem helps us understand sampling distributions! Today, we'll explore the first statement of the CLT and its implications.2. Development (30 minutes)<ol style="list-style-type: none">a. What is the Central Limit Theorem (CLT)?<ul style="list-style-type: none">- Introduce the CLT as a fundamental theorem in statistics that describes the behavior of sample means.- Explain how the CLT applies to random samples drawn from any population (not limited to normal distributions).b. Statement-1 of the CLT<ul style="list-style-type: none">- Focus on the first statement of the CLT: As the sample size increases, the distribution of the sample means tends towards a normal distribution (bell curve).- Discuss how this statement implies that even if the original population data isn't normally distributed, the distribution of sample means becomes more normal with larger samples.- Provide visualizations (graphs) to illustrate the concept for different sample sizes.



	<p>c. Applications of the CLT</p> <ul style="list-style-type: none">- Highlight the importance of the CLT in various statistical applications:<ul style="list-style-type: none">• Hypothesis testing: Allows us to use the normal distribution for sample means even with non-normal populations (under certain conditions).• Confidence intervals: Enables construction of confidence intervals for population means based on sample data.- Emphasize that the CLT applies when sample sizes are large enough (typically $n > 30$). <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present each group with a scenario involving random sampling from a non-normal population (e.g., sampling exam scores).- Ask each group to discuss how the CLT (Statement-1) applies to this scenario.- Encourage them to consider how the distribution of sample means might change with increasing sample sizes.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Statistics How To - The Central Limit Theorem: https://m.youtube.com/watch?v=4YLtvNeRIrg3. Homework<ul style="list-style-type: none">- Think about a real-world situation where sampling is involved (e.g., customer satisfaction surveys, product quality checks).- Explain how the Central Limit Theorem (Statement-1) might be relevant to this scenario.- Consider the sample size typically used in this situation. Would the CLT likely be applicable? Why or why not? <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 27	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the limitations of single-point estimates for project durations. b. Explain how the CLT can be applied to analyze the distribution of project completion times. c. Recognize the benefits of considering the variability of project durations.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the Central Limit Theorem describe in statistics? (Answer: The distribution of sample means) True or False: In project management, single-point estimates for durations always guarantee an accurate project timeline. (Answer: False) How can the CLT be helpful when considering project durations? (Answer: It allows us to understand the probability of completing a project within a certain timeframe)- Imagine estimating how long a project will take. How confident can you be about this estimate?- Project durations can vary! Today, we'll explore how the CLT can help us analyze this variability.2. Development (30 minutes)<ol style="list-style-type: none">a. Challenges of Single-Point Estimates<ul style="list-style-type: none">- Discuss the limitations of using single-point estimates (e.g., optimistic or most likely durations) for project timelines.- Highlight the inherent uncertainties and potential delays that can occur during project execution.b. The CLT and Project Durations<ul style="list-style-type: none">- Explain how the CLT can be applied to the distribution of project completion times when considering multiple projects with similar characteristics.- Although the CLT doesn't directly address individual event times, it allows us to understand the probability of the entire project finishing within a certain timeframe.- Introduce the concept of using tools like PERT (Program Evaluation and Review Technique) which incorporate time estimates with varying probabilities.c. Benefits of Considering Variability



	<ul style="list-style-type: none">- Emphasize the importance of considering the variability of project durations for risk management purposes.- Discuss how understanding the probability distribution of completion times helps develop more realistic project schedules and contingency plans.- Briefly mention techniques like Critical Path Method (CPM) which consider project dependencies and schedule buffer time based on potential delays. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified project scenario with a few key activities (e.g., planning a class event).- Ask each pair to identify potential reasons why the project might take longer than the initial estimate.- Encourage them to discuss how the CLT can be relevant to this scenario, even though it doesn't directly address individual event times.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Statistics How To - The Central Limit Theorem: https://m.youtube.com/watch?v=4YLtvNeRIrg3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on (e.g., studying for an exam, organizing a social event).- Identify potential factors that could cause delays or extend the project duration.- Explain how considering the variability of your project duration, even without precise calculations, can be beneficial for better planning and avoiding last-minute surprises. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 28	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> a. Understand the concept of the Central Limit Theorem (CLT) and its relevance to project durations. b. Explain how the CLT highlights the variability of project completion times. c. Recognize the importance of including slack in project schedules to account for these variations.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> 1. Introduction (5 minutes) <ul style="list-style-type: none"> - Ask questions. <ul style="list-style-type: none"> What does the Central Limit Theorem describe in statistics? (Answer: The distribution of sample means) True or False: Project durations are always fixed and predictable. (Answer: False) How can the CLT be helpful when considering project schedules? (Answer: It helps us understand the probability of completing a project within a planned timeframe) - Imagine planning a road trip. What if you encounter unexpected traffic? How can you prepare for this? - Project timelines face similar challenges! Today, we'll explore how the CLT helps us understand project duration variability and the importance of slack. 2. Development (30 minutes) <ol style="list-style-type: none"> a. The Central Limit Theorem (CLT): A Review <ul style="list-style-type: none"> - Briefly review the concept of the CLT and its statement regarding the distribution of sample means (focusing on large samples). - Emphasize how the CLT applies to project durations when considering multiple similar projects. b. Variability in Project Durations <ul style="list-style-type: none"> - Discuss the inherent uncertainties and potential delays that can affect project timelines. - Introduce the concept of the probability distribution of project completion times based on the CLT. - Explain how this distribution shows the likelihood of finishing a project within a specific timeframe. c. Importance of Slack <ul style="list-style-type: none"> - Define slack (float) in project scheduling as the buffer time intentionally added to account for uncertainties and potential



	<p>delays.</p> <ul style="list-style-type: none">- Connect the concept of slack to the variability highlighted by the CLT.- Explain how understanding the probability distribution of completion times helps determine how much slack to include for better risk management. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified project scenario with a few activities (e.g., painting a room).- Ask each pair to brainstorm potential reasons why the project might take longer than the initial estimate.- Encourage them to discuss how the CLT relates to these uncertainties and why including slack in the schedule might be beneficial.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a recent project you participated in (school project, group activity).- Recall if there were any unexpected delays or challenges during the project execution.- Explain how considering the variability of project durations, even without precise calculations, could have helped in including appropriate slack and potentially avoiding delays. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 29	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of the Central Limit Theorem (CLT) and its relevance to project durations. b. Explain how the CLT emphasizes the impact of variability on project completion times. c. Recognize the importance of focusing on the critical path in project management to mitigate risks associated with variability..
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the Central Limit Theorem describe in statistics? (Answer: The distribution of sample means) True or False: In project management, all activities have the same impact on the overall project duration. (Answer: False) How can the CLT be helpful when considering critical paths? (Answer: It helps us understand which activities are most likely to cause delays impacting the project completion)- Imagine a road trip with several stops. Are all stops equally important for reaching your destination on time?- Project activities have similar variations! Today, we'll explore how the CLT helps us prioritize critical activities that heavily influence project timelines.2. Development (30 minutes)<ol style="list-style-type: none">a. The Central Limit Theorem (CLT): A Review<ul style="list-style-type: none">- Briefly review the concept of the CLT and its statement regarding the distribution of sample means (focusing on large samples).- Emphasize how the CLT can be applied to project durations when considering multiple similar projects.b. Variability and Project Completion<ul style="list-style-type: none">- Discuss the inherent uncertainties and potential delays that affect project timelines.- Introduce the concept of the probability distribution of project completion times based on the CLT.- Explain how this distribution shows the variations in likelihood of finishing a project within a specific timeframe.c. Critical Path Method (CPM)<ul style="list-style-type: none">- Briefly define the Critical Path Method (CPM) as a project scheduling technique that identifies the sequence of activities



	<p>with zero slack (float).</p> <ul style="list-style-type: none">- Explain how the critical path represents the minimum time needed to complete the project, considering activity durations and dependencies. <p>d. CLT and Focus on Critical Path</p> <ul style="list-style-type: none">- Connect the concept of the CLT to the Critical Path by explaining how the variability highlighted by the CLT can significantly impact critical path activities, potentially delaying the entire project.- Emphasize the importance of focusing on managing risks and uncertainties associated with critical activities for successful project completion. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified project scenario with a few activities and dependencies (e.g., organizing a school event).- Ask each pair to identify the critical path for this project.- Encourage them to discuss how the CLT can be relevant by explaining why focusing on managing potential delays in critical activities is crucial.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Mastering Project Management - Critical Path Method Explained: https://m.youtube.com/watch?v=IABi_zuafuk3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on (e.g., studying for an exam, organizing a social event).- Identify the key activities involved and their dependencies.- Try to identify the critical path for this project (if applicable).- Explain how considering the potential variability of activity durations (even without precise calculations) can help you prioritize managing risks associated with critical activities for better project completion. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 1	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Expand on the Central Limit Theorem (CLT) by exploring its second statement. b. Grasp the concept of sampling distribution of sample proportions. c. Recognize the applicability of the CLT (Statement-2) in various scenarios involving proportions.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the first statement of the Central Limit Theorem describe? (Answer: The distribution of sample means) True or False: The CLT only applies to normally distributed populations. (Answer: False) What does the second statement of the CLT focus on, given large enough sample sizes? (Answer: The distribution of sample proportions)- Imagine flipping a coin 100 times and calculating the proportion of heads. How might this proportion differ if you repeated the experiment?- Statement-2 of the CLT helps us understand proportions in sampling! Today, we'll explore its application.2. Development (30 minutes)<ol style="list-style-type: none">a. Review of Statement-1<ul style="list-style-type: none">- Briefly review the first statement of the CLT regarding the distribution of sample means approaching normality with large samples.b. Statement-2 of the CLT<ul style="list-style-type: none">- Introduce the second statement of the CLT: As sample size increases (typically $n > 30$), the distribution of sample proportions (successes out of total samples) approaches a normal distribution regardless of the original population distribution (binary data).- Explain the concept of proportions (e.g., percentage of defective products, customer satisfaction rating).- Provide visualizations (graphs) to illustrate the concept for different sample sizes.c. Applications of Statement-2<ul style="list-style-type: none">- Highlight the importance of the CLT (Statement-2) in various statistical applications involving proportions:



	<ul style="list-style-type: none">• Hypothesis testing: Allows us to use the normal distribution for sample proportions even with non-normal populations (under certain conditions).• Confidence intervals: Enables construction of confidence intervals for population proportions based on sample data.<ul style="list-style-type: none">- Emphasize that the CLT applies when sample sizes are large enough (typically $n > 30$). <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present a scenario involving sampling proportions from a population (e.g., customer satisfaction survey results).- Ask each group to discuss how the CLT (Statement-2) applies to this scenario.- Encourage them to consider how the distribution of sample proportions might change with increasing sample sizes.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- The Essence of the Central Limit Theorem: https://www.youtube.com/watch?v=zeJD6dqJ5lo3. Homework<ul style="list-style-type: none">- Think about a real-world situation where proportions are involved (e.g., voting polls, online product reviews).- Explain how the Central Limit Theorem (Statement-2) might be relevant to this scenario.- Consider the sample size typically used in this situation. Would the CLT likely be applicable? Why or not? <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 31	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand how the Central Limit Theorem (CLT) can be applied to project management. b. Explain the connection between CLT and the probability of completing a project within a timeframe. c. Recognize the limitations of using the CLT for precise probability calculations in individual projects.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the Central Limit Theorem describe in statistics? (Answer: The distribution of sample means) True or False: The CLT guarantees an exact probability of completing a project on time. (Answer: False) How can the CLT be helpful for project managers when considering completion times? (Answer: It helps understand the likelihood of finishing a project within a specific timeframe)- Imagine planning a project with a deadline. How confident are you about meeting that deadline?- The CLT can't predict individual project outcomes, but it offers valuable insights! Today, we'll explore how the CLT helps estimate project completion probability.2. Development (30 minutes)<ol style="list-style-type: none">a. The Central Limit Theorem (CLT): A Review<ul style="list-style-type: none">- Briefly review the concept of the CLT, focusing on its statement regarding the distribution of sample means (especially with large samples).b. CLT and Project Durations<ul style="list-style-type: none">- Explain how the CLT can be applied to the distribution of project completion times when considering multiple similar projects with similar characteristics.- Emphasize that the CLT doesn't predict individual project durations, but helps understand the probability of a group of similar projects finishing within a certain timeframe.c. Estimating Completion Probability<ul style="list-style-type: none">- Introduce the concept of using historical data and statistical techniques (like PERT) to estimate the average project duration and its variability.- Explain how the CLT suggests that the distribution of project



	<p>completion times for similar projects might approach a normal distribution (bell curve) with enough data.</p> <ul style="list-style-type: none">- Discuss how this distribution allows us to estimate the probability of a specific project finishing within a timeframe (e.g., using a confidence interval). <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified scenario with a project duration for a type of project (e.g., website development).- Provide some historical data on completion times for similar projects.- Ask each pair to discuss the limitations of using a single completion time estimate.- Encourage them to consider how the CLT, even without precise calculations, can be helpful by providing a range of possible completion times and the likelihood of finishing within a specific timeframe.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- How To - The Central Limit Theorem: https://m.youtube.com/watch?v=4YLtvNeRIrg3. Homework<ul style="list-style-type: none">- Think about a personal project you're working on.- Identify potential factors that could cause delays or extend the project duration.- Explain how considering the limitations of single-point estimates and the insights from the CLT can be beneficial for a more realistic assessment of the probability of completing your project on time. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 32	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand how the Central Limit Theorem (CLT) can be applied to estimate the probability of project completion within a specific timeframe. b. Recognize the limitations of the CLT in providing a definitive answer but its value in risk assessment. c. Explain the importance of considering project variability and using tools like PERT for more realistic probability estimates.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the Central Limit Theorem describe in statistics? (Answer: The distribution of sample means) True or False: The CLT guarantees that a project will be completed by a specific deadline. (Answer: False) How can the CLT be helpful when considering project completion? (Answer: It allows us to estimate the probability of finishing the project within a certain timeframe)- Imagine planning a project with a deadline. How confident are you that you'll finish on time?- The CLT can't predict the future, but it helps us analyze project completion chances! Today, we'll explore this application.2. Development (30 minutes)<ol style="list-style-type: none">a. CLT and Project Durations<ul style="list-style-type: none">- Briefly review the concept of the CLT and its statement regarding the distribution of sample means (focusing on large samples).- Explain how the CLT can be applied to the distribution of project completion times when considering multiple similar projects with similar characteristics.b. Estimating Completion Probability<ul style="list-style-type: none">- Introduce the concept of using the probability distribution derived from the CLT to estimate the likelihood (probability) of a project finishing within a specific timeframe.- Highlight the limitations of the CLT: It doesn't predict a single outcome but provides a range of possibilities based on historical data or simulations.c. CLT and Project Management Tools<ul style="list-style-type: none">- Discuss how project management tools like PERT (Program



	<p>Evaluation and Review Technique) can be used in conjunction with the CLT for more realistic probability estimates.</p> <ul style="list-style-type: none">- Explain how PERT incorporates time estimates with varying probabilities (optimistic, most likely, pessimistic) to account for project uncertainties. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified project scenario with a few activities and estimated durations (e.g., planning a class presentation).- Ask each pair to discuss the limitations of using a single estimated duration for project completion.- Encourage them to explain how the CLT, even without precise calculations, can be helpful by highlighting the possibility of variations in completion time.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- How To - The Central Limit Theorem: https://m.youtube.com/watch?v=4YLtvNeRIrg3. Homework<ul style="list-style-type: none">- Think about a recent project you participated in (school project, group activity).- Recall the estimated project duration.- Explain how the concept of variability in project completion times, even without applying the CLT, could have been beneficial for planning purposes.- Consider how incorporating this variability might have influenced your approach to risk management or setting deadlines. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 33	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Reinforce the concept of the normal distribution curve (bell curve). Explain how the Central Limit Theorem (CLT) connects to the normal distribution. Recognize the significance of the normal distribution in interpreting sample means from the CLT.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What is the general shape of a normal distribution curve (bell curve)? (Answer: Symmetrical with a peak in the center and tails tapering off towards both sides)</p> <p>True or False: The CLT states that the distribution of sample means will always be perfectly normal, regardless of the original population distribution. (Answer: False)</p> <p>How does the normal distribution curve help us understand the CLT? (Answer: It allows us to visualize the probability of obtaining different sample means when drawing from a population)</p> Imagine flipping a coin 100 times and plotting the number of heads. What kind of distribution might we see? (Normal distribution for large samples) The normal distribution is a key player in the CLT! Today, we'll explore their connection. Development (30 minutes) <ol style="list-style-type: none"> Review of Normal Distribution Curve <ul style="list-style-type: none"> Briefly review the characteristics of the normal distribution curve (bell curve): symmetrical, mean at the center, standard deviation defines spread. Discuss how the normal distribution represents probabilities of different values occurring in a population. The CLT and Normality <ul style="list-style-type: none"> Explain how the CLT (Statement-1) states that the distribution of sample means tends towards a normal distribution as sample size increases ($n > 30$), regardless of the original population's distribution (with some limitations). Emphasize that the normal distribution provides a framework for interpreting the probability of obtaining different sample means when drawing from a population.



	<p>c. Applications of the Normal Distribution with CLT</p> <ul style="list-style-type: none">- Highlight the importance of the normal distribution curve in various statistical applications related to the CLT:• Hypothesis testing: Allows us to use Z-tests or normal distribution tables to assess the probability of observing a sample mean as extreme as the one obtained, assuming the underlying distribution is approximately normal.• Confidence intervals: Enables construction of confidence intervals for population means based on sample data, considering the normal distribution of sample means predicted by the CLT. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a scenario involving sampling from a non-normal population (e.g., exam scores).- Ask each pair to sketch a normal distribution curve and explain how it relates to the CLT.- Encourage them to discuss how the normal distribution helps us understand the probability of obtaining different sample means, even though the original population data might not be normally distributed.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- The Central Limit Theorem: https://www.investopedia.com/terms/c/central_limit_theorem.asp3. Homework<ul style="list-style-type: none">- Think about a situation where data is collected through sampling (e.g., customer satisfaction surveys, product quality checks).- Explain how the normal distribution curve, in conjunction with the CLT, might be relevant to interpreting the results.- Consider the sample size typically used in this situation. Would the assumption of normality for the sample mean distribution be reasonable based on the CLT? Why or why not? <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Model Institute of Engineering
& Technology (Autonomous)
Lesson Plan

Kot Bhalwal, Jammu



Dr. Arun K. Gupta Teaching-Learning Centre

Version 1.1



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Lesson Plan No. 34	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Reinforce the connection between the Central Limit Theorem (CLT) and the normal distribution curve. b. Explain how the CLT describes the tendency of sample means to approach a normal distribution with increasing sample sizes. c. Recognize the significance of the normal distribution in statistical analysis.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What is the general shape of the distribution created by the Central Limit Theorem for sample means (assuming large samples)? (Answer: Normal distribution curve) True or False: The CLT applies only to samples drawn from normally distributed populations. (Answer: False) Why is the normal distribution curve important in statistics? (Answer: It serves as a reference for many statistical tests and helps estimate probabilities)- Imagine flipping a coin 10 times vs. 1000 times. How might the distribution of results differ?- The CLT connects sample means to a predictable pattern! Today, we'll explore the normal distribution curve in this context.2. Development (30 minutes)<ol style="list-style-type: none">a. Review of the CLT<ul style="list-style-type: none">- Briefly review the concept of the CLT and its two main statements:<ul style="list-style-type: none">• Distribution of sample means approaches normality with large samples.• Distribution of sample proportions approaches normality with large samples.- Focus on the first statement related to sample means.b. The Normal Distribution Curve<ul style="list-style-type: none">- Introduce the concept of the normal distribution curve (bell curve) with its symmetrical shape and properties (mean, median, standard deviation).- Explain how the CLT tells us that as sample sizes increase (typically $n > 30$), the distribution of sample means from any population (even non-normal) tends to resemble this normal curve.



	<ul style="list-style-type: none">- Show visualizations of the normal distribution for different sample sizes. <p>c. Importance of the Normal Distribution</p> <ul style="list-style-type: none">- Highlight the significance of the normal distribution in statistics:<ul style="list-style-type: none">• Serves as a reference model for many statistical tests (e.g., hypothesis testing, confidence intervals).• Allows us to calculate probabilities associated with sample means falling within specific ranges under the normal curve. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a scenario with a non-normal population distribution (e.g., exam scores).- Ask each pair to discuss how the CLT applies to this scenario, focusing on the distribution of sample means.- Encourage them to consider how the distribution of sample means might change with increasing sample sizes and how it might relate to the normal distribution.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Central Limit Theorem: https://www.khanacademy.org/math/ap-statistics/sampling-distribution-ap/what-is-sampling-distribution/e/sample-means-central-limit-theorem3. Homework<ul style="list-style-type: none">- Think about a real-world situation where data might not be normally distributed (e.g., income levels, house prices).- Explain how the Central Limit Theorem can still be relevant, even if the original population data isn't normal.- Consider a scenario where you collect a large sample from this population. How might the CLT help you analyze the distribution of sample means, even if you don't know the original population distribution? <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



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Lesson Plan No. 35	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the key differences between Critical Path Method (CPM) and Program Evaluation and Review Technique (PERT) for project scheduling. b. Identify the strengths and weaknesses of each method. c. Apply CPM analysis to identify the critical path in a project schedule.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What is the primary focus of the Critical Path Method (CPM) in project management? (Answer: Identifying the minimum project completion time) True or False: Both CPM and PERT use the same deterministic (single-point) estimates for activity durations. (Answer: False) What is the main advantage of PERT compared to CPM? (Answer: It considers the variability of activity durations)- Imagine planning a complex project. How can we ensure efficient scheduling and identify potential delays?- PERT and CPM are project scheduling tools, but with key differences! Today, we'll explore them and learn CPM analysis.2. Development (30 minutes)<ol style="list-style-type: none">a. PERT vs. CPM: A Comparison<ul style="list-style-type: none">- Briefly define PERT as a technique that considers probabilistic estimates (optimistic, most likely, pessimistic) for activity durations.- Define CPM as a method that uses deterministic (single-point) estimates for activity durations, focusing on resource allocation and minimizing project completion time.- Create a table summarizing the key differences between PERT and CPM (consider factors like time estimates, focus, strengths, and weaknesses).b. Understanding CPM Analysis<ul style="list-style-type: none">- Explain the concept of the critical path in CPM: the sequence of activities with zero slack (float) that determines the minimum project duration.- Discuss the steps involved in CPM analysis: identifying activities, dependencies, durations, calculating slack, and finally, identifying the critical path.- Provide a real-world example (simple project) and illustrate the



	<p>steps of CPM analysis to identify the critical path.</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">- Divide the class into pairs.- Present a simplified project scenario with activities and durations (e.g., planning a school event).- Ask each pair to identify the critical path in this project using CPM analysis.- Encourage them to discuss the importance of the critical path for project management and how focusing on it can help mitigate risks.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- A Guide to Critical Path Method (CPM): https://www.wrike.com/blog/critical-path-is-easy-as-123/3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on (e.g., studying for an exam, organizing a social event).- Try to list down the key activities involved and their estimated durations (assuming deterministic estimates for this exercise).- Imagine you're using CPM for scheduling. Explain how you would identify the critical path in this project (if applicable).- Considering the limitations of using single-point estimates, discuss how PERT might be a better approach for a more realistic project schedule. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 36	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the key differences between Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM). Identify the strengths and weaknesses of each method for project scheduling. Explain the core concepts of CPM analysis, including critical path identification and float calculations.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What do PERT and CPM have in common? (Answer: Both are project scheduling techniques that use network diagrams)</p> <p>True or False: PERT uses only single, deterministic time estimates for activities. (Answer: False)</p> <p>What is the main focus of CPM analysis? (Answer: Identifying the critical path and activities with minimal slack)</p> Imagine planning a construction project or a large event. How can you ensure timely completion? PERT and CPM are valuable tools for project scheduling! Today, we'll explore their differences and how CPM helps analyze project timelines. Development (30 minutes) <ol style="list-style-type: none"> PERT vs. CPM: A Comparison <ul style="list-style-type: none"> Introduce PERT and its key features: <ul style="list-style-type: none"> Uses three time estimates (optimistic, most likely, pessimistic) for activities. Accounts for project uncertainties through probability distributions. More suitable for projects with high levels of uncertainty and limited historical data. Introduce CPM and its key features: <ul style="list-style-type: none"> Uses single, deterministic time estimates for activities. Focuses on identifying the critical path (longest sequence of dependent activities with zero slack). More suitable for projects with well-defined activities and readily available time estimates. Emphasize the complementary nature of PERT and CPM. Core Concepts of CPM Analysis <ul style="list-style-type: none"> Explain the concept of the critical path as the sequence of



	<p>activities with zero slack (float) that determines the minimum project duration.</p> <ul style="list-style-type: none">- Discuss the importance of identifying the critical path for effective project management.- Introduce the concept of float (slack): free time an activity has without delaying the project completion. There are different types of float (total float, free float) but you can focus on the general concept for this lesson. <p>c. Benefits of CPM Analysis</p> <ul style="list-style-type: none">- Highlight the benefits of using CPM analysis:• Provides a clear visual representation of project activities and dependencies.• Enables identification of potential bottlenecks and areas for schedule optimization.• Helps with resource allocation and risk management based on critical path activities. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified project scenario with activities and dependencies (e.g., planning a school trip).- Ask each pair to identify the critical path for this project, assuming deterministic time estimates are available.- Encourage them to discuss the importance of the critical path and how managing activities on this path is crucial for on-time project completion.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- A Guide to Critical Path Method (CPM): https://www.wrike.com/blog/critical-path-is-easy-as-123/3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on (e.g., studying for an exam, organizing a social event).- List down the key activities involved.- Consider which method (PERT or CPM) might be more suitable for scheduling this project. Explain your reasoning based on the project characteristics (uncertainty, time estimates). <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to



	answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents
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Lesson Plan No. 37	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the key differences between Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM). Identify the strengths and weaknesses of each approach in project scheduling. Apply Critical Path Method (CPM) for basic project network analysis.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What is the primary focus of PERT in project scheduling? (Answer: Considering variability in activity durations)</p> <p>True or False: Both PERT and CPM require deterministic (single-point) estimates for activity durations. (Answer: False - PERT uses probabilistic estimates)</p> <p>What does the Critical Path in CPM represent? (Answer: The sequence of activities with zero slack, determining the minimum project duration)</p> Imagine planning a complex project. How do you ensure timely completion? PERT and CPM are project scheduling tools, but with distinct approaches! Today, we'll explore their differences and how to use CPM for analysis. Development (30 minutes) <ol style="list-style-type: none"> PERT vs. CPM: A Comparison <ul style="list-style-type: none"> Introduce PERT and its focus on considering the variability of activity durations through three-time estimates (optimistic, most likely, pessimistic). Explain CPM and its emphasis on deterministic (single-point) estimates for activity durations, focusing on logical dependencies between activities. Highlight the key differences in a table format (consider factors like time estimates, resource allocation, applicability). Strengths and Weaknesses <ul style="list-style-type: none"> Discuss the strengths of PERT: Flexibility in handling uncertainty, suitable for research and development projects. Discuss the strengths of CPM: Clear focus on critical path for efficient scheduling, well-suited for construction or manufacturing projects. Analyze the weaknesses of PERT: Requires more data and



	<p>expertise, may not be as precise for scheduling.</p> <ul style="list-style-type: none">- Analyze the weaknesses of CPM: Less flexible for projects with high uncertainty, may not account for resource limitations effectively. <p>c. Basic CPM Analysis</p> <ul style="list-style-type: none">- Introduce the concept of a network diagram in CPM, representing project activities and dependencies with arrows.- Explain how to calculate the earliest start (ES) and latest start (LS) times for each activity based on network dependencies.- Briefly introduce the concept of slack (float) and its types (free and total slack) in CPM, highlighting its importance in scheduling flexibility. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Provide a simplified project scenario with activities and dependencies (e.g., planning a school event).- Ask each pair to represent the project as a network diagram.- Challenge them to identify the critical path in this project and explain its significance for project completion.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- A Guide to Critical Path Method (CPM): https://www.wrike.com/blog/critical-path-is-easy-as-123/3. Homework<ul style="list-style-type: none">- Think about a personal project you're currently working on (e.g., studying for an exam, organizing a social event).- Identify the key activities involved and their dependencies (if any).- Explain whether PERT or CPM might be a more suitable approach for scheduling this project. Justify your answer based on the project characteristics and the strengths of each method. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 38	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Define float (slack) in CPM project scheduling. b. Explain the differences between total float and free float. c. Recognize the significance of float for project management decisions.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the critical path in CPM represent? (Answer: The sequence of activities with zero slack that determines the minimum project duration) True or False: All activities in a CPM schedule have the same amount of float. (Answer: False) How can understanding float be beneficial in project management? (Answer: It helps identify scheduling flexibility and areas for potential resource allocation adjustments)- Imagine a road trip with planned stops. What if you encounter unexpected traffic delays at one stop? How can some buffer time be helpful?- Float in CPM acts like a buffer in project scheduling! Today, we'll explore different types of float.2. Development (30 minutes)<ol style="list-style-type: none">a. Introduction to Float (Slack):<ul style="list-style-type: none">- Define float (slack) in CPM as the amount of time an activity can be delayed without affecting the project's overall completion time.- Emphasize the importance of float for managing project risks and uncertainties.b. Types of Float:<ul style="list-style-type: none">- Total Float: Explain total float as the maximum amount of time an activity can be delayed without delaying the start of any successor activities.- Free Float: Define free float as the maximum amount of time an activity can be delayed without delaying the earliest start time of any immediate successor activities.- Create a table or diagram illustrating the difference between total float and free float using a simple project example.c. Significance of Float:<ul style="list-style-type: none">- Discuss how understanding float helps project managers make



	<p>informed decisions:</p> <ul style="list-style-type: none">• Resource allocation: Activities with high total float might be candidates for resource sharing with critical path activities (if applicable).• Risk mitigation: Focusing on activities with low or zero float is crucial for proactive risk management to prevent project delays. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified project scenario with a CPM network diagram highlighting activities, durations, and dependencies (e.g., planning a class presentation).- Ask each pair to identify the critical path and calculate the total float and free float for a few selected activities.- Encourage them to discuss the significance of these float values for project management decisions.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a recent project you participated in (school project, group activity).- Recall the project schedule (if available).- Explain how the concept of float might have been relevant to managing that project.- Consider an activity you remember and discuss whether it likely had high total float, high free float, or close to zero float. Explain how this might have influenced project planning or resource allocation decisions. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 39	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Define float (slack) in the context of Critical Path Method (CPM). b. Differentiate between total float and free float in project scheduling. c. Explain the significance of float for project management decisions.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the critical path in CPM represent? (Answer: The sequence of activities with zero slack that determines the minimum project duration) True or False: All activities in a project schedule have the same amount of float. (Answer: False) Why is understanding float important for project managers? (Answer: It helps identify scheduling flexibility and areas where delays might be absorbed without impacting the overall project completion time)- Imagine planning a road trip with multiple stops. Can you have some buffer time between stops without affecting your arrival time?- Float in CPM works similarly! Today, we'll explore different types of float and their importance.2. Development (30 minutes)<ol style="list-style-type: none">a. Introduction to Float (Slack):<ul style="list-style-type: none">- Define float (slack) in CPM as the amount of time an activity can be delayed without extending the project's overall completion time.- Emphasize the concept of critical path activities having zero float.b. Types of Float:<ul style="list-style-type: none">- Total Float: Explain total float as the maximum amount of time an activity can be delayed without impacting the start of its successor activities.- Free Float: Define free float as the maximum amount of time an activity can be delayed without impacting the early start of any successor activities.- Create a table or diagram illustrating the differences between total float and free float with clear examples.c. Relationship Between Total and Free Float:



	<ul style="list-style-type: none">- Explain the connection between total and free float: Total float is always greater than or equal to free float for any activity except the last activity in the project.- Discuss the reasons behind this relationship using the concepts of predecessor and successor activities. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified project scenario with a network diagram showing activities, durations, and dependencies (e.g., planning a class presentation).- Ask each pair to calculate the total float and free float for each activity (assuming the necessary data is provided).- Encourage them to discuss the significance of these float values in managing project schedules.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a recent project you participated in (school project, group activity).- Recall the project schedule (if available).- Explain how understanding float (even without precise calculations) could have been beneficial for project management.- Consider how knowing which activities had more float might have helped with resource allocation or risk mitigation strategies. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 40	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Define float (slack) in CPM project scheduling. b. Explain the differences between total float and free float. c. Recognize the significance of float for project management decisions.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the critical path in CPM represent? (Answer: The sequence of activities with zero slack that determines the minimum project duration) True or False: All activities in a CPM schedule have the same amount of float. (Answer: False) How can understanding float be beneficial in project management? (Answer: It helps identify scheduling flexibility and areas for potential adjustments)- Imagine planning a road trip with multiple stops. Would some flexibility in your schedule be helpful?- Float in CPM provides similar benefits! Today, we'll explore different types of float and their importance.2. Development (30 minutes)<ol style="list-style-type: none">a. Introduction to Float (Slack):<ul style="list-style-type: none">- Define float (slack) in CPM as the amount of time an activity can be delayed without affecting the project's overall completion time.- Emphasize the concept of scheduling flexibility that float offers.b. Types of Float:<ul style="list-style-type: none">- Total Float: Explain total float as the maximum amount of time an activity can be delayed without impacting the start of any subsequent activities.- Free Float: Define free float as the maximum amount of time an activity can be delayed without impacting the early start date of its successor activities.- Create a table or diagram to visually differentiate between total float and free float, considering their impact on different project elements.c. Importance of Float:<ul style="list-style-type: none">- Discuss how understanding float helps project managers:<ul style="list-style-type: none">• Identify scheduling buffer and potential areas for schedule adjustments.



	<ul style="list-style-type: none">• Prioritize tasks and resource allocation based on critical path activities (activities with zero float).• Mitigate risks by focusing on activities with less float that are more susceptible to causing delays. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into pairs.- Present a simplified CPM network diagram with activities, durations, and dependencies.- Ask each pair to calculate the total float and free float for a specific activity within the network.- Encourage them to discuss the significance of these float values in managing the project schedule.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a recent project you participated in (school project, group activity).- Recall if there were any delays during project execution.- Explain how considering float (even without precise calculations) could have been beneficial in managing the project schedule.- Discuss how the concept of float might be relevant to different project stakeholders (e.g., project manager, team members). <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 41	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: a. Understand the importance of critical path analysis in CPM scheduling. b. Explore the concept of time-cost optimization and crashing techniques in CPM. c. Recognize the trade-offs involved in compressing project schedules.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none">1. Introduction (5 minutes)<ul style="list-style-type: none">- Ask questions. What does the critical path in CPM represent? (Answer: The sequence of activities with zero slack that determines the minimum project duration) True or False: Crashing activities in CPM always guarantees project completion on time. (Answer: False) What is a key consideration when applying crashing techniques in CPM? (Answer: The trade-off between reducing project duration and increasing costs)- Imagine planning a construction project. How can we identify the most crucial activities and optimize the schedule?- Critical path analysis and crashing in CPM offer valuable tools! Today, we'll explore these concepts.2. Development (30 minutes)<ol style="list-style-type: none">a. Critical Path Analysis Review:<ul style="list-style-type: none">- Briefly review the concept of the critical path as the sequence of activities with zero slack that determines the minimum project duration.- Emphasize the importance of the critical path for project management decisions.b. Time-Cost Optimization:<ul style="list-style-type: none">- Introduce the concept of time-cost optimization in CPM: the process of potentially reducing the project duration by compressing critical path activities.- Explain that this technique involves analyzing the relationship between activity duration and associated costs.c. Crashing Techniques:<ul style="list-style-type: none">- Discuss various crashing techniques that can be used to shorten critical path activities:<ul style="list-style-type: none">• Adding resources (e.g., manpower, equipment)



	<ul style="list-style-type: none">• Overtime work• Utilizing faster but potentially more expensive methods (if applicable)- Highlight the importance of considering the impact of crashing on project costs and resource availability. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present a simplified CPM scenario with a critical path activity and associated cost information.- Ask each group to discuss potential crashing techniques for this activity, considering the trade-offs between cost and schedule benefits.- Encourage them to explore alternatives and analyze the feasibility of implementing crashing techniques.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a real-world project (e.g., software development, product launch) that involves deadlines.- Explain how time-cost optimization in CPM could be relevant to this project.- Discuss potential crashing techniques that could be considered to shorten the schedule.- Consider the potential downsides of crashing techniques and how project managers can find a balance between cost and schedule constraints. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 42	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ul style="list-style-type: none"> a. Understand the concept of time-cost optimization in CPM. b. Explain the process of crashing critical path activities. c. Recognize the limitations and trade-offs involved in crashing activities.
Teaching Aids (if any)	a. Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> 1. Introduction (5 minutes) <ul style="list-style-type: none"> - Ask questions. What does the critical path in CPM represent? (Answer: The sequence of activities with zero slack that determines the minimum project duration) True or False: The goal of crashing in CPM is always to completely eliminate the critical path. (Answer: False) What is a key consideration when crashing critical path activities? (Answer: The trade-off between reduced project duration and increased project cost) - Imagine a project deadline looming. What options might there be to shorten the project duration? - Crashing in CPM offers a way to expedite the schedule, but at a cost! Today, we'll explore this technique. 2. Development (30 minutes) <ol style="list-style-type: none"> a. Time-Cost Optimization in CPM: <ul style="list-style-type: none"> - Define time-cost optimization as the process of minimizing project duration while considering associated cost increases. - Introduce the concept of crashing critical path activities: techniques used to shorten the duration of activities on the critical path, thereby reducing the overall project duration. b. Crashing Critical Path Activities: <ul style="list-style-type: none"> - Explain that crashing typically involves allocating additional resources (people, equipment) to an activity, leading to increased costs. - Discuss the importance of analyzing the cost-slope of an activity: the rate at which its cost increases with each unit of time reduction. - Briefly mention other crashing techniques (e.g., simplifying procedures, outsourcing tasks) with the understanding that these may not always be applicable. c. Limitations of Crashing: <ul style="list-style-type: none"> - Emphasize the limitations of crashing: not all activities can be



	<p>crashed, and there may be diminishing returns as costs rise sharply with further time reduction.</p> <ul style="list-style-type: none">- Discuss the importance of balancing project schedule needs with resource limitations and cost constraints. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present a simplified CPM scenario with a critical path activity and its estimated cost and duration.- Ask each group to discuss the concept of crashing this activity.- Encourage them to consider the potential increase in cost and the impact on the overall project schedule.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- Project Management Institute (PMI): https://www.pmi.org/3. Homework<ul style="list-style-type: none">- Think about a real-world scenario where a project might face time pressure (e.g., product launch deadline, event preparation).- Explain how the concept of time-cost optimization could be relevant in such situations.- Discuss the potential trade-offs involved in crashing activities and how a project manager might decide whether or not to implement crashing techniques. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>



Lesson Plan No. 43	Course Name: Project Planning Management and System	Course No.: CE-701(B)
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Objectives	At the end of the lesson the student shall be able to: <ol style="list-style-type: none"> Understand the role of critical path analysis in identifying the minimum project duration in CPM. Explore the concept of time-cost optimization and its limitations. Learn about crashing techniques used in CPM to shorten project duration.
Teaching Aids (if any)	<ol style="list-style-type: none"> Chalk and Talk
Teaching Development	<ol style="list-style-type: none"> Introduction (5 minutes) <ul style="list-style-type: none"> Ask questions. <p>What does the critical path represent in a CPM schedule? (Answer: The sequence of activities with zero slack that determines the minimum project duration)</p> <p>True or False: Time-cost optimization in CPM guarantees a shorter project duration without any drawbacks. (Answer: False)</p> <p>What is the main purpose of crashing techniques in CPM? (Answer: To reduce project duration by compressing critical path activities, but at an increased cost)</p> Imagine planning a construction project. How can we ensure it finishes on time while being cost-effective? CPM analysis helps optimize schedules, but sometimes faster means costlier! Today, we'll explore these concepts. Development (30 minutes) <ol style="list-style-type: none"> Critical Path Analysis Review <ul style="list-style-type: none"> Briefly review the concept of the critical path as the sequence of activities with zero slack that determines the minimum project duration. Emphasize the importance of the critical path for project management decisions (focusing resources, managing risks). Time-Cost Optimization <ul style="list-style-type: none"> Introduce the concept of time-cost optimization: the process of balancing project duration (time) with associated costs. Explain that crashing the project schedule (shortening the duration) often leads to increased costs (e.g., overtime pay, additional resources). Discuss the limitations of time-cost optimization: not all activities can be crashed, and there are diminishing returns on crashing efforts. Crashing Techniques <ul style="list-style-type: none"> Introduce the concept of crashing as the technique of compressing critical path activities to shorten the project



	<p>duration.</p> <ul style="list-style-type: none">- Discuss different crashing techniques (e.g., adding resources, overtime work) and their potential impacts (cost increase, resource limitations).- Emphasize the importance of considering the cost-benefit trade-off before crashing activities. <p>3. Exercise (5 minutes) – Give different use-cases and make students select appropriate cloud deployment models.</p> <ul style="list-style-type: none">- Divide the class into small groups.- Present a simplified CPM scenario with a critical path and some non-critical activities.- Ask each group to discuss the potential benefits and drawbacks of crashing a specific critical path activity.- Encourage them to consider the impact on project duration, cost, and resource utilization.
Closure	<ol style="list-style-type: none">1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.2. Suggested Reading<ul style="list-style-type: none">- A Guide to Critical Path Method (CPM): https://www.wrike.com/blog/critical-path-is-easy-as-123/3. Homework<ul style="list-style-type: none">- Think about a project you're familiar with (personal or observed).- Imagine a scenario where there might be pressure to shorten the project duration.- Explain how critical path analysis could be helpful in this situation.- Discuss the potential application of crashing techniques and the trade-offs involved (time vs. cost) in this scenario.- Consider if alternative approaches (e.g., adjusting expectations, managing stakeholder communication) might be more suitable. <p>Spend 5 minutes to wrap up and consolidate the learnings</p>
Evaluation	<ol style="list-style-type: none">1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. <p>Spend 5 minutes to evaluate student assimilation of the lesson contents</p>