

STRUCTURAL CONCRETE ENGINEERING WORKED EXAMPLES STUDENTS TATA

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Structural Concrete Engineering Worked Examples: A Guide for Students

Structural concrete engineering involves designing and constructing concrete structures that can withstand various loads and environmental conditions. To enhance their understanding of the subject, students can benefit from worked examples that illustrate the application of fundamental principles and design codes.

Question 1: Design a rectangular concrete beam to support a uniformly distributed load of 10 kN/m over a span of 5 meters. Assume the beam has a width of 200 mm and a height of 400 mm.

Answer:

- Calculate the bending moment (M) using the formula: $M = (w L^2) / 8$, where w is the load and L is the span. $M = (10 \text{ kN/m} (5 \text{ m})^2) / 8 = 31.25 \text{ kNm}$
- Determine the maximum compressive stress (f'_c) using the formula: $f'_c = (M c) / (I jd)$, where c is the distance from the neutral axis to the extreme fiber, I is the moment of inertia, and jd is the distance from the centroid of the tension reinforcement to the extreme tension fiber.
- Specify the required reinforcement area (A_s) using the formula: $A_s = (M / (f'_c jd)) / 0.85 \cdot f_y$, where f_y is the yield strength of the steel.

Question 2: Determine the shear capacity of a concrete slab reinforced with stirrups. The slab is 200 mm thick and has a span of 4 meters. The compressive strength of concrete is 25 N/mm², the shear reinforcement ratio is 0.5%, and the yield strength of the stirrups is 400 N/mm².

Answer:

- Calculate the effective depth of the slab (d) using the formula: $d = h - (\text{cover} + 0.5 \times \text{diameter of stirrups})$.
- Determine the nominal shear capacity (V_n) using the formula: $V_n = (0.16 f'_c b d + 0.4 f'_c A_{sv} b d) \cot \theta$, where b is the width of the section, A_{sv} is the area of stirrups, and θ is the angle of the stirrups relative to the longitudinal axis of the member.

Question 3: Design a two-way concrete slab for a 6 x 6 meter room that will be used as an office space. The slab will support a live load of 5 kN/m² and a dead load of 2 kN/m².

Answer:

- Determine the total load (w) using the formula: $w = (\text{live load} + \text{dead load}) \times (1 + \phi)$, where ϕ is a factor that accounts for the long-term effects of loads (usually taken as 0.2).
- Calculate the bending moment per unit width ($wL^2 / 8$) in both directions.
- Design the slab thickness and reinforcement based on the maximum bending moments using the principles of one-way slab design.

Question 4: Analyze the axial capacity of a reinforced concrete column with a square cross-section of 300 x 300 mm. The column is reinforced with 8 bars of 25 mm diameter and has a compressive strength of concrete of 30 N/mm².

Answer:

- Calculate the area of concrete (A_c) and the area of reinforcement (A_s).
- Determine the nominal axial capacity (P_n) using the formula: $P_n = 0.85 f'_c A_c + f_y A_s$.

Question 5: Check the development length of a deformed bar in tension in a concrete member. The bar has a diameter of 20 mm, the concrete compressive strength is 25 N/mm², and the yield strength of the steel is 400 N/mm².

Answer:

- Determine the basic development length (L_{db}) using the formula: $L_{db} = (A_f y) / (0.85 f'_c \cdot \lambda)$, where A is the area of the bar and λ is a reduction factor for tension.
- Calculate the required development length (L_{dh}) as $L_{dh} = L_{db} (\lambda C \cdot \lambda)$, where λ is a factor that accounts for the influence of concrete cover, C is a factor that accounts for concrete strength, λ is a factor that accounts for the bar size, and λ is a factor that accounts for the reinforcement ratio.

What can you do with Microsoft VBA? Visual Basic for Applications is a computer programming language developed and owned by Microsoft. You can create macros to automate repetitive word- and data-processing functions with VBA and generate custom forms, graphs, and reports. VBA functions within MS Office applications. It's not a stand-alone product.

What is VBA in MS Project? VBA is an object-oriented language, which means that an "object" has "properties" and "methods." An example object is "Task," and for that an example property is "Name" and an example method is "Delete." A very respectable way to discover the VBA instruction for any action is to record a macro.

What are the advantages of Microsoft Project Management tool over Microsoft Excel? Project can help you quickly adjust your project schedule and resource assignments with its dynamic scheduling engine. It handles a date change and its effects seamlessly, accounting for all dependencies, deliverables, and resource assignments.

Is Microsoft discontinuing VBA? No, it is extremely unlikely that Microsoft will ditch VBA. There are far too many solutions all over the world that rely on it.

What is VBA good for? VBA in Excel is used to automate repetitive tasks, build custom functions, create user-defined forms, manipulate data, and add interactive

features to workbooks.

Is learning VBA worth it? So the answer to your question,” is Excel VBA still worth learning?” is yes. Excel VBA is still worth learning for people looking to automate their day-to-day tasks to increase work efficiency. Learning VBA is the easiest way to customize Excel, and create custom functions by writing codes and scripts in Excel.

Is VBA hard to learn? Although learning VBA requires time and perseverance, this flexible language is relatively easy to learn due to its straightforward syntax. Most individuals can master VBA basics in as little as a few weeks with regular study. Of course, this timeframe depends on several factors.

How long does it take to learn VBA? If you want to, you can learn excel VBA in one week, by spending an hour each day. With some extra time for practicing. However, I would recommend doing it a bit slower, say 2-3 videos a day, with lots of coding practice.

What is the main purpose of Microsoft Project? Microsoft Project is project management software product, developed and sold by Microsoft. It is designed to assist a project manager in developing a schedule, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads.

What is Microsoft Project best used for? Microsoft Project and Microsoft Teams, the power of two Use Project and Teams to empower collaboration and management of projects, including file sharing, chats, meetings, and more.

How is MS Project better than Excel? While Excel requires some fancy formulas, MS Project provides a work-breakdown structure with more meaning, showing users a hierarchy of dependencies between tasks. In this article, we will review an in-depth analysis of what makes MS Project better than MS Excel in certain cases. Need help finding the right software?

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Is VBA similar to Python? VBA might be the go-to for quick, Excel-specific tasks, while Python could be the better choice for more complex data manipulations or when working within a broader data analysis workflow.

What do companies use VBA for? In financial and business analytics, Excel VBA helps professionals evaluate their organization's performance and offer suggestions to improve operations. It also has applications for creating financial models to anticipate future performance.

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Strategic Management Concepts and Cases: Thompson and Strickland

Introduction

Thompson and Strickland's "Strategic Management: Concepts and Cases" is a renowned textbook that provides a comprehensive understanding of strategic management principles and their application in real-world scenarios. This article explores some key concepts and questions covered in the textbook.

1. What is Strategic Management?

Strategic management is a process of developing and implementing strategies to achieve organizational goals. It involves analyzing the external environment, identifying competitive advantages, and formulating and executing plans to improve performance.

2. The Strategic Planning Process

The strategic planning process includes:

- **Environmental Scanning:** Identifying external factors that affect the organization.
- **Internal Analysis:** Assessing the organization's capabilities and resources.

- **Strategy Formulation:** Developing strategic options and selecting the best course of action.
- **Strategy Implementation:** Putting the strategy into practice and monitoring its progress.
- **Evaluation and Control:** Measuring outcomes and adjusting the strategy as needed.

3. Case Analysis: Southwest Airlines

Southwest Airlines is a case study in the textbook that demonstrates successful strategic management. Southwest's key strategies include:

- **Low-cost business model**
- **Focus on point-to-point routes**
- **Efficient operations**

4. External and Internal Analysis

External analysis involves identifying:

- **Opportunities:** Factors that can be exploited to improve performance.
- **Threats:** Factors that can hinder organizational success.

Internal analysis involves assessing:

- **Strengths:** Capabilities that provide a competitive advantage.
- **Weaknesses:** Limitations that can hold back performance.

5. Strategy Formulation and Implementation

Strategy formulation involves selecting a strategy that aligns with the organization's goals and resources. Strategy implementation involves:

- **Allocating resources:** Providing the necessary funding and support for the strategy.
- **Organizational change:** Adapting the organization's structure, systems, and culture to support the strategy.

- **Monitoring and evaluation:** Tracking progress and making adjustments as needed.

In conclusion, Thompson and Strickland's "Strategic Management: Concepts and Cases" provides valuable insights into the key concepts and practices of strategic management. By studying these concepts and examining real-world cases, organizations can develop effective strategies for achieving their long-term goals.

What is the summary of the emotionally absent mother? The Emotionally Absent Mother will help you understand what was missing from your childhood, how this relates to your mother's own history, and how you can fill the “mother gap” Through reflections, exercises, and clear explanations, psychotherapist Jasmin Lee Cori helps adult sons and daughters heal the wounds left by ...

What happens when you have an emotionally absent mother? Individuals who experience emotional neglect may struggle with low self-esteem, heightened self-doubt, and a persistent fear of rejection. These individuals may also develop paranoid tendencies, have difficulty making decisions, and develop a strong inclination to please others.

How to heal from an emotionally absent mother?

How does the absence of mother affect daughters? The impact of mother absence on a daughter's emotional and psychological well-being is profound. Daughters may struggle with feelings of neglect and abandonment, leading to long-term challenges in self-worth, trust, and emotional security.

What does lack of love from a mother cause? Wounds may include lack of confidence and trust, difficulty setting boundaries, and being overly sensitive. Daughters of unloving mothers may unwittingly replicate the maternal bond in other relationships.

What is cold mother syndrome? Cold Mother Syndrome is where one's maternal figure is emotionally absent. Emotionally cold mothers put a psychological distance between themselves and their children. Cold mothers may not appear happy, fulfilled, or excited by their children's growth and accomplishments.

What is depleted mother syndrome? Mom burnout sometimes called depleted mother syndrome, is the feeling of mental, emotional, and physical exhaustion, depersonalization, and lack of fulfillment caused by intense child care demands.

What happens when you grow up with an emotionally unavailable parent? Self-Esteem Issues: There can also be a sense of worthiness that stems from never receiving adequate attention or affection from emotionally detached and distant parents. If love has never been received during developmental years, that then creates the pattern of being unlovable, which greatly impacts self-esteem.

What happens when you grow up without affection? The adults who reported receiving more affection in childhood displayed less depression and anxiety and were more compassionate overall. Those who reported less affection struggled with mental health, tended to be more upset in social situations, and were less able to relate to other people's perspectives.

What does a mother wound look like? Due to the disorienting nature of this trauma, women often dismiss the relevance of their stories, making it hard to untangle what's truly going on behind closed doors. The Mother Wound can manifest as attachment issues, co-dependent patterns, depression and anxiety, disordered eating, and substance misuse.

How to heal from lack of parental love?

How to heal a man with a mother wound?

What happens when a girl grows up without a mother? Self-Esteem Challenges: Low self-worth often stems from internalizing the lack of maternal presence. Emotional Dysregulation: Commonly, difficulties in managing emotions lead to outbursts or withdrawal. Anxiety and Abandonment Fears: The fear of abandonment can lead to insecurity in relationships.

What is unloved daughter syndrome? Unloved Daughter Syndrome refers to a psychological condition where individuals experience feelings of neglect, emotional deprivation, and low self-worth due to a perceived or actual lack of affection, validation, or support from one or both parents, typically the mother.

What are the 5 stages daughters of unloving mothers go through? This overwhelming turmoil affects daughters in incomprehensible ways, and daughters of unloving mothers can even go through stages, similar to the grief cycle: denial, anger, bargaining, depression, and acceptance.

How to heal from an absent mother?

How to heal from a mother who didn't love you?

What is an emotionally unavailable mother like? Emotionally unavailable parents are individuals who struggle to connect with their children on an emotional level. They may be physically present but emotionally distant, preoccupied with their own concerns, or unable to provide the nurturing and support that children need to thrive.

What is an emotionally unstable mother? May ignore or neglect their child's needs for their own needs. Often "lives in the moment," which can include living beyond their financial means. Often has mental health issues and/or diagnoses. May be dismissive or avoidant of their child's feelings.

What is vengeful mother syndrome? Malicious Parent Syndrome refers to situations in which a divorced or divorcing parent deliberately aims to harm the other parent. In some extreme cases, the offending parent may even mistreat their children to tarnish the reputation of the other parent.

What is the worn out mother syndrome? Mom burnout symptoms include decreased effectiveness in your personal and professional life, acting outside of your philosophical orientation toward parenting (like harsh punishments or overblown reactions to minor issues), and the extreme desire to be away from your children.

What is toxic mother syndrome? A toxic mother is a parent whose parenting style causes emotional or psychological harm to their child. A toxic mother consistently engages in negative behaviours that undermine their child's well-being.

What is irritable mother syndrome? Mom rage, also known as maternal rage or maternal anger, describes a mother's experience of overwhelming fits of anger that may arise in an instant and interrupt normal daily life. Mom rage can leave a woman feeling like she is losing control as her anger rises up and she lashes out.

What is the obsessive mother syndrome? Symptoms A Mother May Experience
The symptoms of OCD in motherhood often revolve around the baby's health and safety, but they can also extend to other areas related to personal health, cleanliness, and orderliness.

What is the summary of Don't Tell Mommy? This heart-wrenching memoir from Toni Maguire tells the deeply moving story of an idyllic childhood that masked a terrible truth. Underneath her mother's gentility and her father's roguish charm lay horrifying secrets, which eventually led to their only child's near destruction.

What is the summary of the book Lose Your Mother? In *Lose Your Mother*, Saidiya Hartman traces the history of the Atlantic slave trade by recounting a journey she took along a slave route in Ghana. Following the trail of captives from the hinterland to the Atlantic coast, Hartman reckons with the blank slate of her own genealogy and vividly dramatiz...

What is the summary of the chapter mother's Day? Summary of Mother's Day Priestley. It is a satirical and humorous depiction of the status of the women, in particular, a housewife in a family. Moreover, a housewife dedicates all her time in the service of her family but her family takes her service for granted and never take notice of her needs.

What is the central idea of the chapter the mother's day? Explanation: The central idea of the poem 'Mother's Day' is the recognition and reflection on the role, sacrifices, and value of mothers in society. The poem often points out the imbalance in the way society views and rewards motherhood.

What is the story of her mother's secret? 1939, New York City. Everett's daughter, Alice, a promising ballerina, receives a mysterious letter inviting her to star in a series of advertisements for a cosmetics line. If she accepts she will be immortalized like dancers such as Zelda Fitzgerald, Josephine Baker and Ginger Rogers.

What is the mother I never knew about? Yet another book from the treasure trove of Sudha Murty, *The Mother I Never Knew: Two Novellas* is a poignant tale of two men, Venkatesh and Mukesh, as they set out on a journey to find out the mothers

they never knew. Both men are happy and settled in their respective lives when they come across a shocking truth.

What is the plot twist in Goodbye Mommy? With their mother now freed, Elias discovers that Lukas is nowhere to be seen – which leads us to the major twist: it turns out that he his brother had actually died sometime earlier.

What is the short summary of my mother? Mother is a significant member of every family. She is the female parent of a child who nurtures her baby and protects him/her from the evil gaze of society. She is an integral person in the life of every child and takes care of the entire family with utmost love, care and affection.

What is the summary of stop yelling and love me more mom? This book will show you why strict and permissive parenting do not work. You will learn just how easy it is to embrace a positive parenting style. While learning how to be a positive parent, you will not only heal the relationship with your children but heal yourself along the way.

What is the book about mothers disappearing? At it's heart Elsewhere is an examination at mother-daughter relationships and the complexities of them. Following Vera from childhood to adulthood, reader's get a glimpse into her town's understanding of motherhood, the respect they place on women knowing that they may disappear.

What reason did Mrs. Pearson give Cyril for not making tea? Pearson didn't make tea for Cyril because she explained that they were out of milk. In simple terms, imagine making tea like a recipe – you need different ingredients, and one of them is milk. Mrs. Pearson didn't have any milk at that moment, so she couldn't make the tea the way Cyril liked it.

What does Mrs. Pearson say to Doris that really bothered her? What does Mrs Pearson say to Doris that really bothered her? Answer: Mrs Pearson asked where Doris would wear her yellow silk dress. She said that she planned to go out with Charlie Spence. Mrs Pearson told her to find somebody better, and insulted Charlie Spence by calling her buck-toothed and was half-witted.

How was George surprised by the behaviour of his wife essay? Answer: George finds his wife Annie (Mrs Pearson) drinking stout at the wrong time of the day. Moreover, he has never seen her doing it before. Naturally, he is confused and surprised. When he remarks that he doesn't like her drinking and it doesn't look right.

Why is Mrs. Pearson always ordered about by her family members? Answer. Explanation: Although she wants to be treated like a human being, she never asks her family members to do so, because of her timid nature. She does not argue with them because she does not want to cause any discomfort within the family.

How does Mrs. Fitzgerald plan to deal with the family of Mrs. Pearson? Expert-Verified Answer firstly mrs frizgerald changed her body with mrs pearson..then she talked with their family in a badf manner and telling that they should do thier work own..

What change do you notice in George Doris and Cyril at the end of the play? What change do you notice in George, Doris and Cyril at the end of the play? Ans. They are no longer thoughtless and overbearing in their behavior. Cyril and Doris agree to get supper ready while their mom have a talk with their father.

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