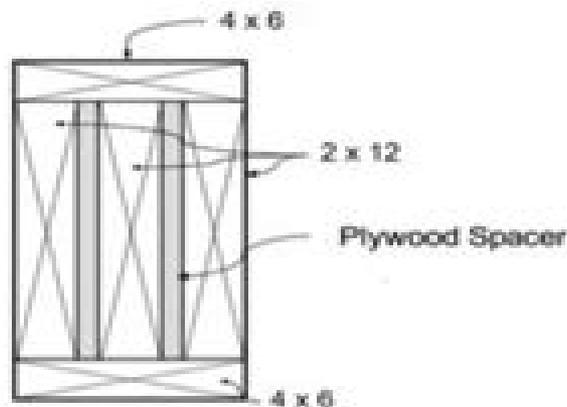


# Homework Assignment 1

## Statics and Strength of Materials

### Problem Statement

Find the required properties for the composite wood beam shown below.

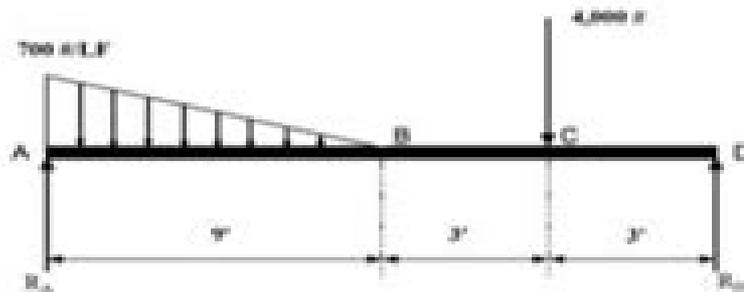


1. Cross-sectional area,  $A$
2.  $I_x$ ,  $S_x$ , and  $r_x$
3.  $I_y$ , and  $r_y$

Hint 1: use the Souder book Appendix 6 for the standard dressed size of wood components.

Hint 2: Consider this cross-section as a whole to calculate the required properties (it is rectangular, don't overthink).

Refer to the sketch of the simply supported beam shown below to compute the required information:



4. Compute the resultant load ( $P_r$ ) of the 700 #/LF and the 4,000 #
5. Distance from A to the resultant load
6. Reactions  $R_A$  and  $R_D$
7. Maximum moment,  $M_{max}$
8. Maximum shear,  $V_{max}$

All work shall be shown neatly and professionally prepared (handwritten or in text editing software) and uploaded to Canvas as a single PDF file.

# Statics And Strength Of Structures

**Mario George Salvadori**



## **Statics And Strength Of Structures:**

**Statics and Strength of Structures** Mario George Salvadori,1971      **Determinate Structures** French,1996-01-01  
This books provides professional builders contractors and engineers a complete and seamless study of statically determinate structures including concrete steel masonry and timber      **Applied Statics, Strength of Materials, and Building Structure Design** Joseph B. Wujek,1999 Unique in perspective approach and coverage this book is written specifically to introduce architectural construction and civil engineering technicians to elementary engineering concepts design principles and practices Using a practical non classical non calculus approach it combines in one volume full coverage of the statics strengths of materials and building structure analysis design concepts that technicians must master for the demands of today s changing workplace Provides nearly 180 examples and over 200 supporting illustrations and photographs including photos of buildings under construction and in sequence Contains a very comprehensive set of tables of structural products and their properties For anyone studying or interested in architectural technology architectural engineering technology structural technology structural engineering technology civil engineering technology construction engineering technology or construction management      **Statics and Strength of Materials** Lawrence J. Wolf,1988 A parallel approach to understanding structure      **The History of the Theory of Structures** Karl-Eugen Kurrer,2012-01-09 This book traces the evolution of theory of structures and strength of materials the development of the geometrical thinking of the Renaissance to become the fundamental engineering science discipline rooted in classical mechanics Starting with the strength experiments of Leonardo da Vinci and Galileo the author examines the emergence of individual structural analysis methods and their formation into theory of structures in the 19th century For the first time a book of this kind outlines the development from classical theory of structures to the structural mechanics and computational mechanics of the 20th century In doing so the author has managed to bring alive the differences between the players with respect to their engineering and scientific profiles and personalities and to create an understanding for the social context Brief insights into common methods of analysis backed up by historical details help the reader gain an understanding of the history of structural mechanics from the standpoint of modern engineering practice A total of 175 brief biographies of important personalities in civil and structural engineering as well as structural mechanics plus an extensive bibliography round off this work      [Determinate Structures](#) Samuel E. French,2000      [Statics and Mechanics of Structures](#) Steen Krenk,Jan Høgsberg,2013-03-02 The statics and mechanics of structures form a core aspect of civil engineering This book provides an introduction to the subject starting from classic hand calculation types of analysis and gradually advancing to a systematic form suitable for computer implementation It starts with statically determinate structures in the form of trusses beams and frames Instability is discussed in the form of the column problem both the ideal column and the imperfect column used in actual column design The theory of statically indeterminate structures is then introduced and the force and deformation methods are explained

and illustrated An important aspect of the book s approach is the systematic development of the theory in a form suitable for computer implementation using finite elements This development is supported by two small computer programs MiniTruss and MiniFrame which permit static analysis of trusses and frames as well as linearized stability analysis The book s final section presents related strength of materials subjects in greater detail these include stress and strain failure criteria and normal and shear stresses in general beam flexure and in beam torsion The book is well suited as a textbook for a two semester introductory course on structures

**Welding of Tubular Structures** Yong Zhou,2016-01-21 Welding of Tubular Structures focuses on the testing techniques and other processes connected with welding tubular structures in different conditions and environments The selection features the works of individuals who have devoted time in the study of welding particularly on tubular structures and other materials The discussions focus on the design of connections of welded structures including the process of welding and inspection Attention is given to weldments on offshore structures and primary concerns include the testing of the materials used and how these materials fall short if subjected to stress and fatigue Different welding techniques used on offshore structures are also discussed Welding techniques on other materials are also noted These discussions are supported by studies that are backed up by numerical representations which is aimed at validating the strength of welded materials Consideration is given when these welded materials suffer from crack or fatigue Analysis of the factors why these welded materials fail to meet standards is done A comparative study is also conducted on aluminum steel and other products when these are subjected to stress in different conditions and environments The book is a primary source of data to those in the welding sector particularly those working in offshore structures

**Proceedings**,1925

**Structural Wood Design** Abi Aghayere,Jason Vigil,2007-07-30 A simple practical and concise guide to timber design To fully understand structural design in wood it is not sufficient to consider the individual components in isolation Structural Wood Design A Practice Oriented Approach Using the ASD Method offers an integrative approach to structural wood design that considers the design of the individual wood members in the context of the complete wood structure so that all of the structural components and connectors work together in providing strength Holistic practical and code based this text provides the reader with knowledge of all the essentials of structural wood design Wood structural elements and systems that occur in wood structures Structural loads dead live snow wind and seismic and how to calculate loads acting on typical wood structures Glued laminated lumber and allowable stresses for sawn lumber and Glulam The design and analysis of joists and girders Floor vibrations The design of wood members subjected to axial and bending loads Roof and floor sheathing and horizontal diaphragms Exterior wall sheathing and wood shear walls The design of connections and how to use the connection capacity tables in the NDS code Several easy to use design aids for the preliminary sizing of joists studs and columns In keeping with its hallmark holistic and practice oriented approach the book culminates in a complete building design case study that brings all the elements together in a total building system design Conforming throughout to the 2005

National Design Specification NDS for Wood Structural Wood Design will prepare students for applying the fundamentals of structural wood design to typical projects and will serve as a handy resource for practicing engineers architects and builders in their everyday work

*International Congress on Architectural Education, 28 July to 2 August, 1924* Royal Institute of British Architects, 1925

**28 July to 2 August 1924**, 1925

*Statics and Strength of Materials for Architecture and Building Construction* Barry Onouye, Kevin Kane, 2002 A valuable reference source this richly illustrated user friendly text provides an informative introduction to structures and appeals to architectural and building construction students strong need for visual reinforcement No calculus is required

**General Catalogue** Massachusetts Institute of Technology, 1915

**Annual Catalogue** Massachusetts Institute of Technology, 1892

*Statics, Strengths, and Structures for Architects* Bezaleel Solomon Benjamin, 1991

*Applied Statics and Strength of Materials (Book Only)* Thomas Burns, 2009-02-27

APPLIED STATICS AND STRENGTH OF MATERIALS 2nd Edition provides engineering and construction technology readers with a strategy for successful learning of basic structural behavior and design The book is written at a fundamental level while providing robust detail on problem solving methods on a variety of recognizable structures systems and machines Topics covered include easy to understand discussion on equilibrium trusses frames centroids moment of inertia direct stress combined stress beam mechanics and much more The book also includes extensive coverage on the design of beams columns and connections which include the latest design specifications using steel concrete and wood More than 175 fully worked examples and 500 exercise problems offer thorough and comprehensive reinforcement of the material using recognizable structural and mechanical elements which connect the readers to the real world

**The New Werner Twentieth Century Edition of the Encyclopaedia Britannica**, 1907

*Catalogue* Howard University, 1920

*Materials and Manufacturing: An Introduction to How they Work and Why it Matters* Mark Atwater, 2018-09-14 A practical guide to materials and manufacturing concepts and applications Written in a straightforward conversational style this comprehensive textbook offers a hands on introduction to materials science and manufacturing techniques You will explore metallic and nonmetallic materials their properties and applications and how products are made from them including traditional additive and advanced manufacturing methods

*Materials and Manufacturing An Introduction to How They Work and Why It Matters* starts off by explaining materials science fundamentals and progresses to outline manufacturing processes in the order in which they are often employed Coverage includes Metallic materials and processing Nonmetallic materials and processing Practical considerations in materials and manufacturing Material structure identification and application Compositional and property based classification Mechanical thermal and environmental concepts Methods of testing materials Sawing broaching filing and abrasive machining Milling turning boring and hole making operations Cohesive assembly through heat and chemical welding Mechanical and adhesive assembly and finishing operations The benefits and roles of additive and advanced manufacturing

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