

<<工程力学专业英语>>

图书基本信息

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## <<工程力学专业英语>>

### 前言

学习完大学英语之后,不少工科专业的本科学生面对本专业的英语教材、英语科技论文都感到无所适从.感觉到自己的英语水平还差得太远。

其实,许多工科专业都是以数学和力学为基础的,只要掌握了常用的数学词汇和基本的力学词汇,阅读本专业的英语文献是不成问题的。

本书为高等院校工程力学专业的“专业英语”课程教材。

它以工程力学专业教学计划及《工程力学专业英语》教学大纲为指导,兼顾土木、水利、机械等相近专业的需要,是编者在多年专业英语教学实践的基础上编写而成的。

全书按单元编排.涵盖了常用的数学词汇及基本的力学词汇。

书中主要内容有理论力学、材料力学、结构力学、弹性力学、塑性力学、有限元法、流体力学、土木工程、结构设计、高层建筑、水工结构、建筑材料、项目管理等。

书后的附录中列出了常用数学符号的读法及缩略语。

参加本书编写工作的有华北水利水电学院白新理、谢巍、张建华和河南黄河河务局杨志超四位同志。

全书由白新理教授担任主编,谢巍、张建华担任副主编。

研究生范渊源、于巍、王单飞、王俊峰等同学参加了部分整理工作。

本书由郑州大学孙利民教授及华北水利水电学院孙大风教授担任主审。

他们审阅了书稿.并提出了有益的建议和建设性的修改意见。

华北水利水电学院杨开云、孟闻远、郑恒祥三位教授也对本书提出了指导性的建议。

本书参考了许多文献资料.在此向有关作者、编者一并表示谢意。

由于编者水平有限,再加上时间仓促,书中可能有不少疏漏、不妥,甚至错误之处.恳请读者批评指正。

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### 内容概要

由白新理主编的《工程力学专业英语》按单元编排，涵盖了常用的数学词汇及基本力学词汇，主要内容有理论力学、材料力学、结构力学、弹性力学、塑性力学、有限元法、流体力学、土木工程、结构设计、高层建筑、水工结构、建筑材料、项目管理等。最后，在附录中列出了常用数学符号的读法及缩略语。

《工程力学专业英语》可作为高等院校工程力学专业的“专业英语”课程教材，也可作为土木工程相关专业学生的参考用书。

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computed in the analytical model of the actual structure for the assumed design conditions may or may not be in close agreement with the stress intensities produced in actual structure by the actual conditions to which it is exposed. The degree of correspondence is not important, provided that the computed stress intensities can be interpreted in terms of previous experience. The selection of the service conditions and the allowable stress intensities provides a margin of safety against failure. The selection of the magnitude of this margin depends on the degree of uncertainty regarding loading, analysis, design, materials, and construction and on the consequences of failure. For example, if an allowable tensile stress of 20000 psi is selected for structural steel with a yield stress of 33000 psi, the margin of safety (or factor of safety) provided against tensile yielding is  $33000 / 20000$ , or 1.65. The allowable-stress approach has an important disadvantage in that it does not provide a uniform overload capacity for all parts and all types of structures. As a result, there is today a rapidly growing tendency to base the design on the ultimate strength and serviceability of the structure, with the order allowable-stress approach serving as an alternative basis for design. The newer approach currently goes under the name of strength design in reinforced-concrete design literature and plastic design in steel-design literature. When proportioning is done on the strength basis, the anticipated service loading is first multiplied by a suitable load factor (greater than 1), the magnitude of which depends upon the uncertainty of the loading, the possibility of its changing during the life of the structure, and, for a combination of loadings, the likelihood, frequency, and duration of the particular combination. In this approach for reinforced-concrete design, the theoretical capacity of a structural element is reduced by a capacity-reduction factor to provide for small adverse variations in material strengths, workmanship, and dimensions. The structure is then proportioned so that, depending on the governing conditions, the increased load would: (1) cause a fatigue or a buckling or a brittle fracture failure or; (2) just produce yielding at one internal section or simultaneous yielding at several sections) or; (3) cause elastic plastic displacement of the structure or; (4) cause the entire structure to be on the point of collapse.

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