

纺织工程专业
双语教材



纺织高等教育“十一五”部委级规划教材

Knitting Technology (Third edition)

针织学

(第三版)

[英] 戴维·J. 斯潘塞 编著
宋广礼 李红霞 杨昆 译

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David J Spencer



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内 容 提 要

本书是一本在国内最有影响的英文版针织专业书籍。本书介绍了针织的基本概念、基本术语、基本理论,纬编和经编的工艺、设备和织物结构,横编设备和产品,袜品的编织设备和工艺。此外,本书还介绍了针织科学研究、计算机在针织上的应用和产业用针织产品等。第三版在前两版的基础上增添了近年来发展的新型针织技术,使本书更具新意。本书可作为针织学双语教学教材,也可作为针织专业英语教材使用,同时可供相关专业的师生教学参考。对于从事针织生产、管理、贸易等相关人员也不失为一本难得的英文原版专业书籍。

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原著者:David J Spencer

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出版者的话

全面推进素质教育,着力培养基础扎实、知识面宽、能力强、素质高的人才,已成为当今本科教育的主题。教材建设作为教学的重要组成部分,如何适应新形势下我国教学改革要求,与时俱进,编写出高质量的教材,在人才培养中发挥作用,成为院校和出版人共同努力的目标。2005年1月,教育部颁发了教高[2005]1号文件“教育部关于印发《关于进一步加强高等学校本科教学工作的若干意见》”(以下简称《意见》),明确指出我国本科教学工作要着眼于国家现代化建设和人的全面发展需要,着力提高大学生的学习能力、实践能力和创新能力。《意见》提出要推进课程改革,不断优化学科专业结构,加强新设置专业建设和管理,把拓宽专业口径与灵活设置专业方向有机结合。要继续推进课程体系、教学内容、教学方法和手段的改革,构建新的课程结构,加大选修课程开设比例,积极推进弹性学习制度建设。要切实改变课堂讲授所占学时过多的状况,为学生提供更多的自主学习的时间和空间。大力加强实践教学,切实提高大学生的实践能力。区别不同学科对实践教学的要求,合理制定实践教学方案,完善实践教学体系。《意见》强调要加强教材建设,大力锤炼精品教材,并把精品教材作为教材选用的主要目标。对发展迅速和应用性强的课程,要不断更新教材内容,积极开发新教材,并使高质量的新版教材成为教材选用的主体。

随着《意见》出台,教育部组织制订了普通高等教育“十一五”国家级教材规划,并于2006年8月10日正式下发了教材规划,确定了9716种“十一五”国家级教材规划选题,我社共有103种教材被纳入国家教材规划,其中本科教材56种,高职教材47种。56种本科教材包括了纺织工程教材13种、轻化工程教材16种、服装设计与工程教材24种、美术教材2种,其他1种。为在“十一五”期间切实做好教材出版工作,我社主动进行了教材创新型模式的深入策划,力求使教材出版与教学改革和课程建设发展相适应,充分体现教材的适用性、科学性、系统性和新颖性,使教材内容具有以下三个特点:

(1)围绕一个核心——育人目标。根据教育规律和课程设置特点,从提高学生分析问题、解决问题的能力入手,教材附有课程设置指导,并于章首介绍

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本章知识点、重点、难点,及专业技能,增加相关学科的最新研究理论、研究热点或历史背景,章后附形式多样的习题等,提高教材的可读性,增加学生学习兴趣和自学能力,提升学生科技素养和人文素养。

(2)突出一个环节——实践环节。教材出版突出应用性学科的特点,注重理论与生产实践的结合,针对性地设置教材内容,增加实践、实验内容。

(3)实现一个立体——多媒体教材资源包。充分利用现代教育技术手段,将授课知识点制作成教学课件,以直观的形式、丰富的表达充分展现教学内容。

教材出版是教育发展中的重要组成部分,为出版高质量的教材,出版社严格甄选作者,组织专家评审,并对出版全过程进行过程跟踪,及时了解教材编写进度、编写质量,力求做到作者权威,编辑专业,审读严格,精品出版。我们愿与院校一起,共同探讨、完善教材出版,不断推出精品教材,以适应我国高等教育的发展要求。

中国纺织出版社
教材出版中心

译者序

《针织学》(第三版) (*Knitting Technology*) 一书由英国的著名针织专家 David J Spencer 编著, 于 1983 年出版第一版。该书在我国影响很大, 是我国各相关院校针织学教学的主要外文参考书, 很多高校也把它作为专业英语教材使用。为了配合纺织工程专业和服装工程专业的双语教学, 在中国纺织出版社的大力支持下, 我们将此书翻译成针织学双语教材。本书采用的是原书的最新版本, 即 2001 年第三版。

原书共有 30 章, 鉴于本书篇幅所限, 根据我国针织专业教学的实际情况, 经广泛征求行业内专家的意见, 在编译过程中删除了部分章节, 现保留 24 章。删除的各章是: 1. An introduction to textile technology, 2. From hand knitting to hand frame knitting, 6. Comparison of weft and warp knitting, 8. The various types of weft knitting machines, 17. The straight bar frame and full-fashioning, 20. Circular garment-length machines。书后的索引也一并删除, 增补词汇表, 以便读者查阅。另外在保留的各章中, 也适当地删除了部分小节, 在这里就不一一列出。除此之外, 全部保留了原书的章节体系。

本书由天津工业大学教师翻译。其中第 1 ~ 第 14 章由宋广礼翻译, 第 16 ~ 第 18 章由李红霞翻译, 第 15 章、第 19 ~ 第 24 章由杨昆翻译。

由于译者水平有限, 书中难免有不当之处, 敬请读者批评指正。

2006 年 8 月于天津

Preface / 前言

The aim of this book is to combine in a single volume the fundamental principles of weft and warp knitting in such a manner that its contents are useful to readers in education, industry or commerce. It thus fulfils the long felt need for a comprehensive up-to-date textbook explaining this important sector of textile technology. Aspects covered include flat, circular, full fashioned, hosiery, Raschel, tricot and crochet production. The inclusion of the historical development of the types of machines, their actions and mechanisms as well as the construction, properties and end use of the products which they manufacture, make the book acceptable as a set text for Textile courses from technician to degree and Textile Institute examination level. It will also prove particularly suitable for professionals wishing to update or broaden their understanding of knitting.

The contents have been arranged for the convenient use of different levels of readership with the text gradually progressing from an explanation of basic terminology and principles to eventually encompass the most advanced aspects of the technology including the application of microprocessor controls and developments in knitting science. Care has been taken where possible to emphasise fundamental rules and principles which are less likely to be drastically altered by developments in later technology.

The indexed and referenced format of the text is supplemented by labelled diagrams and photographs so that the book may also serve as a handy reference work for study and business purposes. Terminology is defined either according to Textile Institute terms and definitions or current usage in the industry and is supplemented as necessary by American or continental terminology. Internationally accepted methods of notation help to clarify explanations of fabric structures. Although SI units and the tex yarn count system have been explained and used in the text, other systems of measurement and yarn count systems have also been employed wherever it has been considered that their usage is still of importance. A number of worked calculations have been included in certain chapters to further clarify explanations and assist students.

It is hoped that the inclusion of a number of fashion photographs will encourage

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design and sales personnel to come to terms with technology whilst emphasizing the importance of end-product design to technologists.

This edition includes developments in electronic control and selection in warp and weft knitting. Basic software programming is covered with particular reference to shaping and integral knitting of complete garments. New information regarding the historical development of knitting techniques has also been included.

An additional chapter has been added to cover the rapidly expanding sector of technical textiles. Chapter 30 deals with the exacting requirements and end-uses of technical textiles and the type of knitted structures that can meet these conditions.

It is particularly satisfying that this book has proved useful in education, industry and commerce throughout the world. I hope the above mentioned additions will further increase its usefulness.

*Knossington
Leicestershire*

DAVID J. SPENCER

Acknowledgements / 致谢

First and second editions / 第一、第二版

I wish to express my sincere appreciation to all those individuals and organisations who have directly or indirectly contributed towards the publication of this book. Although a full list of names would be too long for publication, I would particularly like to express my gratitude to the following:

Mr Ralph Innes who first raised the subject of this book and then magnanimously handed over the project to me;

Mr J. B. Lancashire who meticulously read through much of the draft of the script and made many helpful comments regarding it;

Mr Eric Keates who originally produced many technical diagrams of structures and mechanisms which are recognised throughout the knitting world by his initials E.A.K.;

Mr Walter Bullwer who has kindly supplied many of the technical photographs; my colleagues and other members of staff at Leicester Polytechnic particularly the library and clerical staff who have assisted me over the years in obtaining the research material and in collating my notes;

Mr Arthur Martin who first encouraged me to study Textiles at Leicester Polytechnic;

Corahs of Leicester who sponsored my education in knitting technology and with whom I gained invaluable technical experience;

my wife Shirley Ann and my parents who assisted with typing and amending the script with an apology to my family for the disruption which the evening and early morning routine of script writing has tended to produce.

Although it has not always been possible to utilise all the material provided for the book I would also particularly like to thank the following for their generous assistance in this matter:

Mr John T. Millington and Mr John Gibbon of Knitting International; Mr Eric Hertz of Knitting Times; Mr Lehner and Mr Jeff Caunt of Karl Mayer; Mr R.

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Third edition / 第三版

For this third edition, apart from those already mentioned, I would like to thank the following for their support and assistance:

I wish to express my very special thanks to my son Nigel who has, on numerous occasions and with great patience, rescued my computer system from self-destruction together with the script of this book.

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John Millington, who continues to promote and support an understanding of knitting technology.

John Mowbray, the new Editor of *Knitting International*, for ensuring that the latest information in knitting technology is collated and disseminated.

Michael Dicks and colleagues at Shima Seiki for their hospitality and for constantly up-dating me on the latest developments in flat knitting technology.

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Finally, I would like to thank Patricia Morrison and Mary Campbell of Woodhead Publishing Limited for their patient reassuring support when deadlines approached.

David J. Spencer



课程设置指导

本课程设置意义 根据教育部关于在高校开设双语教学课程,引进原版教材的精神开设本门课程。通过本课程的学习,使学生既掌握针织专业的基本原理和概念,又了解专业的前沿科学与技术,还能够掌握针织专业术语词汇,熟悉专业英语的表述方法,有助于培养适应我国纺织工业发展需要、具有专业知识和对外交流能力的高级工程技术人才、管理人才和贸易人才。

本课程教学建议 针织学双语课程作为高等院校纺织工程专业的专业课,根据不同教学需要,可安排 60~80 学时,教学内容包括本书的全部内容或选讲其中的主要内容。

本课程教学目的 通过本课程的学习,学生应掌握针织的基本概念和基本原理,熟悉针织物的组织结构及其编织方法,了解针织设备的主要机构、工作原理及其生产工艺。同时掌握相应的针织专业词汇、专业语言的表述方法,能够较流畅地阅读和笔译课文的内容。

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