

# **LaTeX2e guide for authors using the EngC design**

**Subtitle, if you have one**

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## List of contributors

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CB2 8RU

## Notation

AFM	atomic force microscope
AKPZ	anisotropic KPZ equation
$a_0$	lattice constant
$c_q(\ell)$	q-th order correlation function
$d_E$	embedding dimension
$d_f$	fractal dimension
$L$	system size
$\equiv$	<i>defined</i> to be equal
$\sim$	<i>asymptotically</i> equal (in scaling sense)
$\approx$	<i>approximately</i> equal (in numerical value)

# Part I

---

## Getting started



# 1 Introduction

---

This guide is for authors who are preparing a book for Cambridge University Press using the  $\LaTeX$  document preparation system, and the EngC class file.

The  $\LaTeX$  document preparation system is a special version of the  $\TeX$  typesetting program.  $\LaTeX$  adds to  $\TeX$  a collection of commands which simplify typesetting by allowing the author to concentrate on the logical structure of the document rather than its visual layout.

$\LaTeX$  provides a consistent and comprehensive document preparation interface. There are simple-to-use commands for generating a table of contents (toc), lists of figures and/or tables, and indexes.  $\LaTeX$  can automatically number list entries, equations, figures, tables, and footnotes, as well as parts, chapters, sections and subsections. Using this numbering system, bibliographic citations, page references and cross references to any other numbered entity (e.g. chapter, section, equation, figure, list entry) are quite straightforward.

$\LaTeX$  is a powerful tool for managing long and complex documents. In particular, partial processing enables long documents to be produced chapter by chapter without losing sequential information. The use of document classes allows a simple change of style to transform the appearance of your document.

## 1.1 The $\LaTeX 2_{\epsilon}$ book document class

The EngC class file preserves the standard  $\LaTeX$  interface such that any document which can be produced using the standard  $\LaTeX 2_{\epsilon}$  book class can also be produced with the EngC class. However, the measure (i.e. width of text) is different from that for book, therefore linebreaks will change and long equations may need re-setting.

## 1.2 The EngC document class

The EngC design has been implemented as a  $\LaTeX 2_{\epsilon}$  class file, and is based on the book class as discussed in the  $\LaTeX$  manual. Commands which differ from the standard  $\LaTeX$  interface, or which are provided in addition to the standard interface, are explained in this guide. This guide is *not* a substitute for the  $\LaTeX$  manual itself.

### 1.3 Implementing the EngC class file

Copy EngC.cls into the correct subdirectory on your system. The EngC document class is implemented as a complete document class, *not* a document class option. To run this guide through L<sup>A</sup>T<sub>E</sub>X, you need to include the following class and style files:

```
\documentclass{EngC}
\usepackage[rightcaption,raggedright]{sidecap}% for side captions
\usepackage{framed} % for floatingboxes
\usepackage{soul} % for letterspacing in theorem-style headings
\usepackage[agsm]{harvard}
\usepackage{rotating}
\usepackage{floatpag}
\rotfloatpagestyle{empty}
\usepackage{amsthm}
\usepackage{graphicx}
\usepackage{multind}\ProvidesPackage{multind}
```

It may be that your book does not use references, rotation, theorems, graphics, or multiple indexes, in which case you simply need the first line. If you include `multind.sty`, you must also insert the command `\ProvidesPackage{multind}`. More recent style files include this information; it simply sends a message to the class file to re-style the index into the EngC style.

In general, the following standard document class options should *not* be used:

- 10pt, 11pt, 12pt;
- oneside (twoside is the default);
- fleqn, leqno, titlepage, twocolumn.

### 1.4 Implementing the multi-contributor option

This option should be used where chapters have been written by different contributors. Please read Section 1.3 first; then implement the `[multi]` option as follows:

```
\documentclass[multi]{EngC}
```

Further details can be found in Section 2.6.2.

### 1.5 Fonts

The typefaces for the final typeset version of the EngC design are Times for the text, and Adobe Helvetica Neue Condensed for the sans-serif elements, such as headings.

It is a good idea to start working with these fonts straight away; you will get an idea

of the final look of the text, and you will know the extent. If you cannot use the Adobe font for any reason, it is acceptable to default to the standard Times sans-serif.

If your book is going to be typeset by Cambridge University Press, you are welcome to submit your files using Computer Modern; we will change the font. Authors supplying final PDFs must use Times.

### 1.5.1 Times

We recommend you use one of the following versions of Times:

1. mathptmx, available from:  
<http://www.ctan.org/tex-archive/fonts/psfonts/psnfss-source/mathptmx/>
2. txfonts, available from:  
<http://www.ctan.org/tex-archive/fonts/txfonts/>

Mathptmx changes the default roman font to Adobe Times, but does not support bold math characters.

Txfonts does support bold math, but the kerning of subscripts and superscripts is not ideal. You must load txfonts *after* amsthm.sty, otherwise you will get some ‘already defined’ messages.<sup>1</sup>

### 1.5.2 Adobe Helvetica Neue Condensed

This typeface is available to purchase in OpenType format from Adobe. If you have this typeface and are able to convert it to a L<sup>A</sup>T<sub>E</sub>X-usable format, include it by adding the [prodtf] option as follows:

```
\documentclass[prodtf]{EngC}
```

This command will call in helvneue.sty, which is distributed with this package.

## 1.6 Submission of files

Please note that you must supply a PDF of your files so that the typesetters can check characters such as bold math italic. If you are providing final PDF files for printing, remember to embed all fonts as Type 1 fonts.

## 1.7 Make-up

This is a generic guide for many Cambridge designs. We have therefore not attempted to correct long lines, and there are occasions where pages may be a little long. The latter is due to the use of `\begin{samepage}... \end{samepage}` where we are keeping text

<sup>1</sup> The reason we do not include times.sty as an option is because it mixes Computer Modern and Times fonts, and there is a clash between math and italic characters.

together for clarity. Authors should not include any page make-up commands, unless they are providing final PDFs for printing.



## 2 The EngC class file in detail

---

Magnús Már Magnússon<sup>a</sup> and David Tranah<sup>b</sup>

International Glaciological Society

The following notes may help you achieve the best effects with the EngC class file.

### 2.1 Frenchspacing

The `\frenchspacing` option has been selected by default. This ensures that no extra space is inserted after full points, and is normal practice. If there is a strong reason for reversing this, you can key `\nonfrenchspacing` in the preamble.

### 2.2 Adding a subtitle to the front page

The standard `\title` command has been extended to take an optional argument which is then used as a subtitle on the main title page. For example, this document uses following title command:

```
\title[Subtitle, if you have one]
{LaTeX2e guide for authors using the \cambridge\ design}
```

### 2.3 Adding a blank page to your document

Blank pages should not be numbered. If you require one, use the command `\cleardoublepage`, which has been redefined to start the next page on a recto, and if necessary, insert a totally blank verso page first.

### 2.4 Chapter numbering

If your book starts with an unnumbered chapter (e.g. `\chapter*{Introduction}`), then make all the numbered elements (e.g. section heads) unnumbered, by using `\section*{...}`. Otherwise, sections will be numbered 0.1, 0.2, etc.

<sup>a</sup> Formerly of the Icelandic Meteorological Office, Reykjavík.

<sup>b</sup> Supported by NSF Grant 43645.

## 2.5 Section numbering

L<sup>A</sup>T<sub>E</sub>X provides five levels of section heads, and they are all defined in the EngC class file: `\section`, `\subsection`, `\subsubsection`, `\paragraph`, and `\subparagraph`. Numbers are given for the first three headings.

You can reduce the level of numbered section heads (it is not advisable to increase them). For instance, if you only want headings numbered down to subsections, add the following line to the preamble: `\setcounter{secnumdepth}{2}`. To number down to sections, make this `\setcounter{secnumdepth}{1}`, etc.

## 2.6 Specifying running heads and toc entries

### 2.6.1 Single-contributor books

In EngC, chapter titles and section heads are used as running heads at the top of every page:

- chapter titles appear on even-numbered pages (versos), and
- section heads appear on odd-numbered pages (rectos).

A problem with the standard version of L<sup>A</sup>T<sub>E</sub>X has always been that the shortened versions of chapter and section titles, specified for running heads, have also been the entries for the toc. There are packages such as the memoir class which enable you to specify different toc entries, running head entries, and chapter titles. However, there is a simple way to add the verbose version of the chapter or section heads into the toc:

```
\chapter[Toc entry]{Verbose chapter title}
\chaptermark{Running head entry}

\section[Toc entry]{Verbose section title}
\sectionmark{Running head entry}}
\sectionmark{Running head entry}
```

Note that for sections, you need the optional argument to `\section`, even if ‘Toc entry’ is in fact the same text as ‘Verbose section title’. Also, the `\sectionmark` has to be entered twice as shown, because the first `\sectionmark` deals with the header of the page that the `\section` command falls on, and the second deals with subsequent pages.

### 2.6.2 Multi-contributor books

Using the EngC multi-contributor option, author(s) name(s) and chapter titles are used as running heads at the top of every page:

- author(s) name(s) appear on even-numbered pages (versos), and
- chapter titles appear on odd-numbered pages (rectos).

The author(s) names(s) may run to several lines, and contain new line commands (e.g. `\\`), but the running head must be a single line. To enable you to specify an alternative short form of the author(s) name(s), the standard `\author` command has been extended to take an optional argument to be used as the running head:

```
\author[Author(s) name(s)]{The full author(s) name(s)}
```

The following shows some coding for a chapter written by two authors, each of whom have footnotes. In this example, the authors' names will immediately follow the chapter title, and will read Magnús Már Magnússon<sup>a</sup> and David Tranah<sup>b</sup>. Their respective footnotes will be '<sup>a</sup> Formerly of the Icelandic Meteorological Office, Reykjavík.' and '<sup>b</sup> Supported by NSF Grant 43645.' It is crucial that `\author` precedes `\chapter`. If the authors have footnotes, you must start the chapter with `\alphafootnotes`, fill in the details for author(s), chapter title and author footnotes, then key `\arabicfootnotes` to revert to arabic footnotes:

```
\alphafootnotes
\author[M\,M Magn\'usson and D\,A Tranah]
  {Magn\'us M\'ar Magn\'usson\footnotemark\
  and David Tranah\footnotemark\\
  International Glaciological Society}

\chapter[Running head entry]
  {The \cambridge\ class file in detail}

\footnotetext[1]{Formerly of the Icelandic
  Meteorological Office, Reykjav\'i k.}
\footnotetext[2]{Supported by NSF Grant 43645.}
\arabicfootnotes
```

Note that for multi-contributor books, the long version of the chapter title will always appear in the table of contents.

## 2.7 Adding author(s) name(s) in single-contributor books

Sometimes, chapters in single-contributor books are written by different people. If you wish the authors (and their affiliations) to appear beneath the chapter opening, as demonstrated in this chapter, key your chapter head as follows; note that `\chapterauthor` must precede `\chapter`:

```
\alphafootnotes
\chapterauthor{Magn\'us M\'ar Magn\'usson\footnotemark\
  and David Tranah\footnotemark
  \affil{International Glaciological Society}}
```

```

\chapter{The \cambridge\ class file in detail}

\footnotetext[1]{Formerly of the Icelandic
  Meteorological Office, Reykjav\`i k.}
\footnotetext[2]{Supported by NSF Grant 43645.}
\arabicfootnotes

```

If you have footnotes associated with the authors, you will also need to insert `\alphafootnotes` and `\arabicfootnotes`.

## 2.8 List of contributors

The code for generating an automatic list of contributors should be entered after the author and chapter titles, as follows:

```

\contributor{Magn\`us M\`ar Magn\`usson
  \affiliation{International Glaciological Society,
    Scott Polar Research Institute,
    Lensfield Road, Cambridge CB2 1ER}}

\contributor{David Tranah
  \affiliation{Cambridge University Press,
    The Edinburgh Building, Shaftesbury Road,
    Cambridge CB2 8RU}}

```

You then simply need to add the `\listofcontributors` command after the table of contents (or after the artwork lists, if included) in the preamble, as follows:

```

\tableofcontents
\listoffigures
\listoftables
\listofcontributors

```

### 2.8.1 Note to editors regarding the list of contributors

The contributors will appear in the same order as they are called in, since the list is generated in the same way as the table of contents. This means that at the final stage, the file will require editing to make the entries alphabetic.

Once you have a complete list of contributors, comment out the line which is generating them, and replace it as shown below:

```

\tableofcontents
\listoffigures
\listoftables
%\listofcontributors
\editedlistofcontributors

```

Next, rename the file with the extension `.loc` to `editedloc.tex` (in the case of this guide, you would rename `EngCguide.loc` to `editedloc.tex`). Edit this file as required, then run the file through  $\text{\LaTeX}$  once more, and the edited version will appear.

## 2.9 Adding an abstract

The following code will give you an unnumbered section head ‘Abstract’. Keep the abstract to one paragraph:

```
\begin{abstract}
  Thermal convection driven by centrifugal...
\end{abstract}
```

## 2.10 Adding an extract

You may add an extract – the following coding:

```
\begin{extract}
  In a semiparametric model, some aspects of the data
  distribution are specified in terms of a small number of
  parameters, but other aspects are left arbitrary.
\end{extract}
```

will produce:

In a semiparametric model, some aspects of the data distribution are specified in terms of a small number of parameters, but other aspects are left arbitrary.

## 2.11 Adding a ‘copyright’ line to a chapter opening page

If you are publishing a single chapter, with permission from Cambridge University Press, you may be required to add a copyright line (and/or other information) to the footer of the chapter opening page. This may be achieved using:

```
\copyrightline{Reprinted from \textit{Mathematical
  Methods for Physics and Engineering} by Riley,
  Hobson and Bence \copyright\ 2009 Cambridge
  University Press.}
```

Should the following chapter not require the copyright line, reverse this immediately before the next `\chapter` command by using:

```
\copyrightline{}
```

## 2.12 Changing the level of entries in the table of contents

The EngC design will, by default, list parts, chapters and sections in the table of contents. However, to improve the usefulness of this guide, we have used the command:

```
\setcounter{tocdepth}{2}
```

to increase this by one level, so the table of contents in this document also shows sub-sections.

## 2.13 Lists

The EngC class provides the following standard list environments:

1. numbered lists, created using the `enumerate` environment;
2. bulleted lists, created using the `itemize` environment;
3. labelled lists, created using the `description` environment.

The `enumerate` environment numbers each list item with an arabic numeral followed by a full point; alternative styles can be achieved by inserting a redefinition of the number labelling command after the `\begin{enumerate}`. For example, a list numbered with lower-case letters inside parentheses can be produced. Because ‘(a)’ is wider than a standard arabic digit, the label width has to be increased. This is achieved by specifying the widest label in the list inside square braces:

```
\begin{enumerate}[(a)]
  \renewcommand{\theenumi}{(\alph{enumi})}
  \item estimate the fluctuations in the near-wall region\ldots
  \item subdue these near-wall fluctuations\ldots
\end{enumerate}
```

This produces the following list:

- (a) estimate the fluctuations in the near-wall region...
- (b) subdue these near-wall fluctuations...

## 2.14 Endnotes

In addition to footnotes,<sup>1</sup> the EngC class provides a similar facility for endnotes. Their appearance depends on which option you are using:

1. for single-contributor books, the endnotes will be produced in the form of an unnumbered chapter at the end of the book;
2. for multi-contributor books, they are an unnumbered section at the end of each chapter.

<sup>1</sup> The footnote counter will be reset on chapters.

Endnotes are inserted into the text in a similar way to footnotes, but using the `\endnote` command; for example,

```
When the Richardson number\endnote{Lewis Fry Richardson
(1881--1953).\label{richardson}} increases\ldots
```

will produce ‘When the Richardson number<sup>1</sup> increases...’ in the text. Authors must choose between using footnotes and endnotes; do not use both.

### 2.14.1 Single-contributor books

Endnotes should be printed at the end of the book, after the appendices but before the bibliography and/or references.

```
:
\theendnotes
\begin{thebibliography}{99}
:
```

The `\theendnotes` command generates an unnumbered chapter which appears in the table of contents (see page 51 for style).

### 2.14.2 Multi-contributor books

Endnotes should be printed at the end of the chapter using the same `\theendnotes` command.

## 2.15 Examples

Examples have rules both above and below. If you require two or more to appear together, simply add another `\item` within the `examplelist` environment (e.g. Example 2.2):

```
\begin{examplelist}
\item Show that the geometrical definition of grad leads to the
      usual expression for  $\nabla\phi$  in Cartesian coordinates.
\solution
      Consider a small rectangular volume element  $\Delta V =$ 
 $\Delta x, \Delta y, \Delta z$  with its faces parallel to the
 $x, y, z$  coordinate surfaces and with the point  $P$  at one
      corner. We must calculate\ldots

\item Find the Fourier series of  $f(x) = x^3$  for  $0 < x \leq 2$ .
\label{fourier}
\solution
```

In the example discussed in the previous section we found the Fourier series for  $f(x) = x^2$  in the required range. So, if we `\textit{integrate}` this term by term`\ldots`

`\end{examplelist}`

This will produce:

---

**Example 2.1** Show that the geometrical definition of grad leads to the usual expression for  $\nabla\phi$  in Cartesian coordinates.

**Solution**

Consider a small rectangular volume element  $\Delta V = \Delta x \Delta y \Delta z$  with its faces parallel to the  $x, y, z$  coordinate surfaces and with the point  $P$  at one corner. We must calculate...

**Example 2.2** Find the Fourier series of  $f(x) = x^3$  for  $0 < x \leq 2$ .

**Solution**

In the example discussed in the previous section we found the Fourier series for  $f(x) = x^2$  in the required range. So, if we *integrate* this term by term...

---

## 2.16 Problems

Authors may use the `problemlist` environment which will typeset problems at the end of each section or chapter. This is shown in the following example:

```
\begin{problemlist}
  \item Show that the link between shock formation and
        film rupture is invoked here because of the\ldots
  \item Show that the physical interpretation of\ldots
        \label{physi}
\end{problemlist}
```

which will produce:

**Problems**

**2.1** Show that the link between shock formation and film rupture is invoked here because of the...

**2.2** Show that the physical interpretation of...

As with all numbered environments, individual problems (e.g. Problem 2.2) may be cross-referenced.



## 2.17 Boxes

Boxes may be typeset using the following coding. They are effectively floats, and so can take the optional arguments [h], [t], [b], as used for figures and tables. The following coding produces Box 2.1:

```
\begin{floatingbox}[h]
  \caption{Floating box title}
  There are grounds for cautious optimism that we may now
  be near the end of the search for the ultimate laws of
  nature -- Stephen Hawking
  \label{fb}
\end{floatingbox}
```

### Box 2.1 Floating box title

There are grounds for cautious optimism that we may now be near the end of the search for the ultimate laws of nature – Stephen Hawking

## 2.18 Figures

The EngC class file will cope with most positioning of your figures. As captions normally fall below figures, the figure must be included first, then the caption, then the label. This is illustrated in Figure 2.1. The `cantor1.eps` file has been called in by using `\usepackage{graphicx}` in the preamble. Note that if you are producing a list of illustrations (using `\listoffigures`), you need to repeat the caption in square braces, but without the full point.

### 2.18.1 Figures between two-thirds and full text width

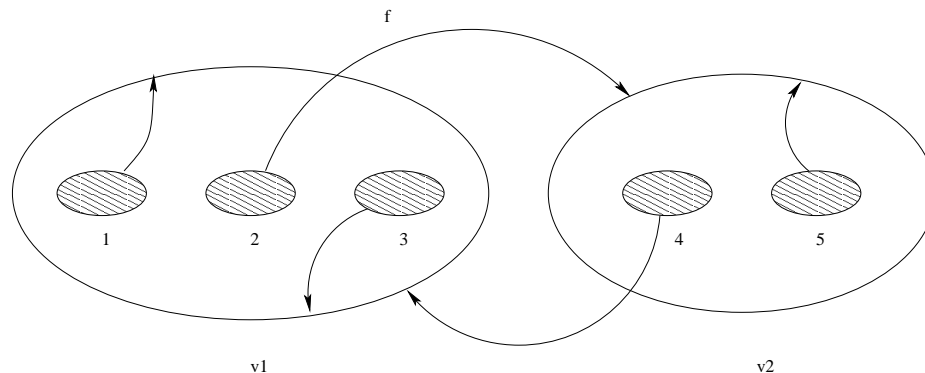
If the width of the figure lies between two-thirds and the full text width (in other words, between 19pc and 29pc), the figure may be typeset using standard  $\LaTeX$  coding (see Figure 2.1).

### 2.18.2 Figures less than two-thirds of the text width

If you have a figure which takes up less than two-thirds of the text width, i.e. less than 19pc, you have two options. You may either have the caption below the figure, or choose the space-saving option of placing it to the side.

#### Caption below figure

In this case, you would use the `figure` environment (see Figure 2.1) and size your figure accordingly.



**Figure 2.1** A Cantor repeller. Figure captions will be left-aligned, 29pc wide, and unjustified.

---

```

\begin{figure}
  \includegraphics[width=\textwidth]{cantor1.eps}
  % note that the square brace option below is only required
  % if you intend to produce a list of illustrations
  \caption[Shortened figure caption for the list of illustrations]
    {A Cantor repeller. Figure captions will be left-aligned,
     29pc wide, and unjustified.}
  \label{cantor}
\end{figure}

```

---

### Caption to the side of figure

To typeset the figure caption to the side, we recommend using the `sidecap` style file; for coding see Figure 2.2. Note that the `[50]` option on the first line will make the caption extend to the full width of the page, and is therefore essential.

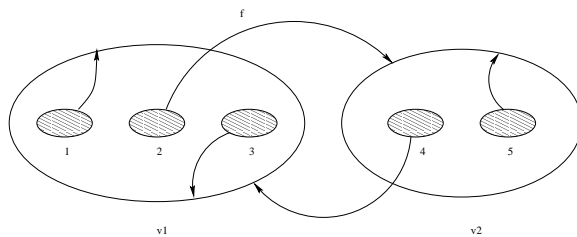
Should you have a long caption which extends below the figure, you will need to revert to the `figure` environment.

### 2.18.3 Figures wider than the text width

The EngC design will allow you to have figures exactly 33pc wide; these will extend into the left margin. For these, you would use the standard `figure` environment, but you need to add `\widefigure` before the graphic is included, as shown in Figure 2.3.

## 2.19 Tables

The EngC class file will cope with most positioning of your tables. Tables need to be keyed slightly differently depending on their width. When you are first writing your



**Figure 2.2** The SCfigure environment should be used if you would like a side caption.

---

```

\begin{SCfigure}[50]
  \includegraphics[width=18pc]{cantor1.eps}
  \caption[Figure with side caption]
    {The \texttt{SCfigure} environment should be used if you
     would like a side caption.}
  \label{scfigure}
\end{SCfigure}

```

---

book, assume that they will all be the full width of the page (see Section 2.19.1), and adjust this later.

As captions are normally positioned above tables, the caption must be included first, then the label, then the table. Note that if you are producing a list of tables (using `\listoftables`), you need to repeat the caption in square braces, but without the full point.

Note that the `\begin{tabular}{@{}lllllll@{}}` command always starts and finishes with `@{}`. This removes the space to the left of the first column, and to the right of the last column. You need to do this as the specification for tables in the EngC design is flush-left.

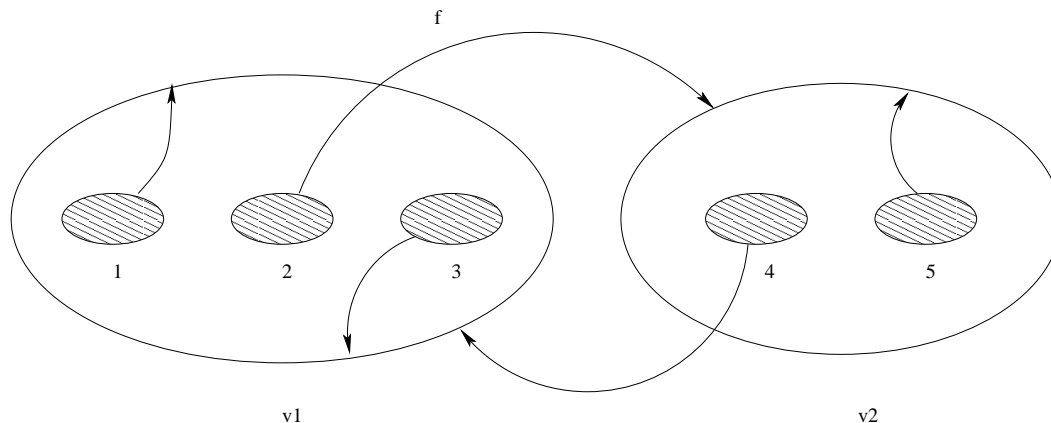
### 2.19.1 Tables between two-thirds and full text width

If the width of the table lies between two-thirds and the full text width (in other words, between 19pc and 29pc), the table may be typeset using `table*` (see Table 2.1).

The `table*` environment will give full-page width `\hlines`; as a result you will most likely need to increase the space between columns to make the table fill the width of the page. If you are producing the final typeset version of your book, the space may be increased by changing `\tabcolsep` as shown in Table 2.1. If not, do not concern yourself with these values as they may change with a font substitution.

### 2.19.2 Tables less than two-thirds of the text width

If you have a table which takes up less than two-thirds of the text width, i.e. less than 19pc, you have two options. You may either have the caption above the table, or choose the space-saving option of placing it to the side.



**Figure 2.3** Wide figures (33pc) may extend into the left-hand margin.

---

```

\begin{figure}
  \widefigure
  \includegraphics[width=33pc]{cantor1.eps}
  \caption[A wide figure]
    {Wide figures (33pc) may extend into the left-hand margin.}
  \label{widefigure}
\end{figure}

```

---

### Caption above table

In this case, you would use the `table` environment; see Table 2.2.

### Caption to the side of table

To typeset the table caption to the side, we recommend using the `sidecap` style file; for coding see Table 2.3. Note that the `[50]` option on the first line will make the caption extend to the full width of the page, and is therefore essential.

Should you have a long caption which extends below the table, you will need to revert to the `table` environment.

## 2.19.3 My vertical rules have disappeared

Vertical rules in tables are not EngC style, and have been automatically removed; this gives your document a truly professional look. Instead of vertical rules, we recommend the use of extra horizontal space, see Section 2.19.6. The rules have been removed by redefining the `tabular` environment. The amended definition also inserts extra vertical space above and below the horizontal rules (produced by `\hline`).

If you really must have them reinstated, read Section 2.19.4.

**Table 2.1** Probability left and right of the exact confidence limits for the ratio of exponential means for the cost data. The exact limits were computed using the  $F$  distribution and the approximate probability using the  $r^*$  approximation. In this example, the Lugannani–Rice and  $r^*$  approximations are identical.

Exact	0.20	0.10	0.05	0.025	0.001
Approx. (left)	0.199 98	0.099 992	0.049 997	0.024 999	0.0001 000
Approx. (right)	0.200 03	0.100 239	0.050 015	0.025 009	0.0001 000

---

```

\begin{table*}
  \caption[Probability left and right for the cost data]
    {Probability left and right of the exact confidence limits
     for the ratio of exponential means for the cost data.
     The exact limits were computed using the  $F$ -distribution and
     the approximate probability using the  $r^*$  approximation.
     In this example, the Lugannani–Rice and  $r^*$  approximations
     are identical.}
  \label{problimits}
  \addtolength{\tabcolsep}{4pt}% to stretch columns, if required
  \begin{tabular}{@{}l l l l l l@{}}
    \hline
    Exact
      & 0.20      & 0.10      & 0.05      & 0.025     & 0.001\\
    Approx. (left)
      & 0.199\,98 & 0.099\,992 & 0.049\,997 & 0.024\,999 & 0.0001\,000\\
    Approx. (right)
      & 0.200\,03 & 0.100\,239 & 0.050\,015 & 0.025\,009 & 0.0001\,000\\
    \hline
  \end{tabular}
\end{table*}

```

---

#### 2.19.4 Reinstating the vertical rules

Authors can revert to the standard  $\text{\LaTeX}$  style, if necessary. Tables will take on a rather squashed appearance, as in the  $\text{\LaTeX}$  book, whereby there is no added space around horizontal rules. Add the command `\reinstaterules` in the preamble, and re-run your files through  $\text{\LaTeX}$ .

#### 2.19.5 There is very little space around the rules in my table

Tables revert to the standard, rather squashed look of standard  $\text{\LaTeX}$  tables for two reasons:

1. you are using `array.sty`; or
2. you have chosen to reinstate vertical rules (see Section 2.19.4)

In both cases, the `tabular` environment is redefined.

**Table 2.2** Longer table captions have to be placed inside a minipage, otherwise they overhang the table rules.

Figure <sup>a</sup>	$hA$	$hB$	$hC$
1	$\exp\left(\pi i \frac{5}{8}\right)$	$\exp\left(\pi i \frac{1}{8}\right)$	0
2	-1	$\exp\left(\pi i \frac{3}{4}\right)$	1
3	$-4 + 3i$	$-4 + 3i$	$\frac{7}{4}$
4	-2	-2	$\frac{5}{4}i$

<sup>a</sup> Note: You must also use a minipage environment if you have footnotes.

---

```

\begin{table}
  \begin{minipage}{160pt}
    % note that the square brace option below is only required
    % if you intend to produce a list of tables
    \caption[Shortened table caption for the list of tables]
      {Longer table captions have to be placed inside a minipage,
       otherwise they overhang the table rules.}
    \label{piexample}
    \addtolength{\tabcolsep}{2pt}% to stretch columns, if required
    \begin{tabular}{@{}c@{\hspace{25pt}}ccc@{}}
      \hline
      Figure\footnote{\textit{Note:} You must also use a minipage
        environment if you have footnotes.} & $hA$ & $hB$ & $hC$\\
      \hline
      1 & $\exp\left(\pi i \frac{5}{8}\right)$ & $\exp\left(\pi i \frac{1}{8}\right)$ & $0$\\
      2 & $-1$ & $\exp\left(\pi i \frac{3}{4}\right)$ & $1$\\
      3 & $-4+3i$ & $-4+3i$ & $\frac{7}{4}$\\
      4 & $-2$ & $-2$ & $\frac{5}{4}i$ \\
      \hline
    \end{tabular}
  \end{minipage}
\end{table}

```

---

## 2.19.6 Adding space between columns

You can add space (2pt in this example) between every column using `\addtolength{\tabcolsep}{2pt}`. However, if you only wanted to expand the space between columns 1 and 2 to 25pt, you would do this using `\begin{tabular}{@{}c@{\hspace{25pt}}ccc@{}}` (see Table 2.2).

Measured	Theoretical
431	432
450	470
431	442
453	439
481	502
449	445
441	455

**Table 2.3** The STable environment should be used if you would like a side caption. Measured and theoretical temperatures ( $^{\circ}\text{C}$ ) in 20 sections of a reactor (Cox and Snell, 1981, Example D).

---

```

\begin{STable}[50]
  \caption[Table with side caption]
  {The \texttt{STable} environment should be used if you
   would like a side caption. Measured and theoretical
   temperatures~( $^{\circ}\text{C}$ ) in~20~sections of a reactor
   (Cox and Snell, 1981, Example~D).}
  \label{sctable}
  \begin{tabular}{@{}cc@{}}
    \hline
    Measured & Theoretical\\
    \hline
    431 & 432\\
    450 & 470\\
    431 & 442\\
    453 & 439\\
    481 & 502\\
    449 & 445\\
    441 & 455\\
    \hline
  \end{tabular}
\end{STable}

```

---

### 2.19.7 Adding space between rows

If you need some form of separation between rows (for example, between rows 2 and 3 in the body of Table 2.2), adding [11pt] immediately after the double backslash at the end of row 2 will add a 11pt vertical space (the equivalent of a blank line at this typesize). This is neater than adding another horizontal line.

## 2.20 Landscape figures and tables, using rotating.sty

Landscape figures and tables (floats) may be typeset using the rotating.sty package. Note that the direction of rotation depends on the page number – which requires at least two passes through L<sup>A</sup>T<sub>E</sub>X. If we are going to know whether pages are odd or even, we

need to use the `\pageref` mechanism, and labels. But labels won't work unless the user has put in a caption. *Beware!*

In addition to `rotating.sty`, you should also include `floatpag.sty` and the command `\rotfloatpagestyle{empty}`. This combination ensures that headers and footers are removed from the float page:

```
\usepackage{rotating}
\usepackage{floatpag}
\rotfloatpagestyle{empty}
```

In some DVI previewers, floats may not appear rotated. If this happens, you need to convert the DVI file to PostScript or PDF.

Occasionally, when you convert a PostScript file to a PDF file, you may find that the page comes out upside-down. There will be a setting to change this. For instance, if you are using PDFCreator 0.9.7, choose the following options in this sequence:

Options – Program – PDF – Auto-Rotate Pages: Change to 'None'.

Other programs will have similar procedures.

### 2.20.1 Coding for landscape figures

The landscape figure (Figure 2.4) was typeset using the following coding:

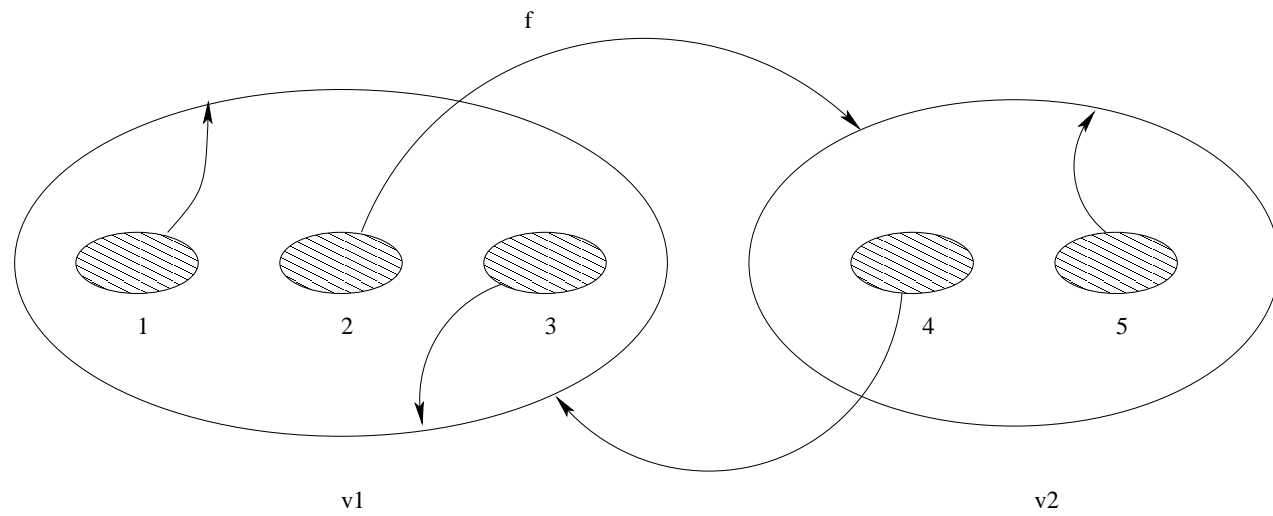
```
\begin{sidewaysfigure}
\centering
\includegraphics[scale=0.85]{cantor1.eps}
% note that the square brace option below is only required
% if you intend to produce a list of illustrations
\caption[Landscape figure]{A Cantor repeller. Figure captions
will be centred by default.}
\label{sidecantor}
\end{sidewaysfigure}
```

### 2.20.2 Coding for landscape tables

Table 2.4 has been produced using the following coding:

```
\begin{sidewaystable}
\begin{minipage}{465pt}
\caption[Landscape table]{Grooved ware and beaker features, their finds and
radiocarbon dates. For a breakdown of the pottery assemblages see
Tables~I and~III; for the flints see Tables~II and~IV; for the animal
bones see Table~V.}
\label{sideways}
\addtolength\tabcolsep{-2pt}
\begin{tabular}{@{}lcccc@{}}
\hline
Context & Length & Breadth/ & Depth & Profile & Pottery & Flint & Animal
```





**Figure 2.4** A Cantor repeller. Figure captions will be centred by default.

```

& Stone & Other & C14 Dates\\
&& Diameter &&&& Bones\\[-5pt]
& m & m & m\\
\hline\\[-5pt]
\multicolumn{10}{@{}l}{\textbf{Grooved Ware}}\\
784 & -- & 0.9$\phantom{0}$ & 0.18 & Sloping U & P1 & & $\times$46  

& $\phantom{0}$ & $\times$8 & & $\times$2 bone & 2150 & $\pm$100\, ,\textsc{bc}\\
785 & -- & 1.00 & 0.12 & Sloping U & P2--4 & & $\times$23  

& & $\times$21 & Hammerstone & -- & --\\
962 & -- & 1.37 & 0.20 & Sloping U & P5--6 & & $\times$48  

& & $\times$57 & --& --& 1990 & $\pm$80\, ,\textsc{bc} (Layer 4)\\
&&&&&&& 1870 & $\pm$90\, ,\textsc{bc} (Layer 1)\\
983 & 0.83 & 0.73 & 0.25 & Stepped U & -- & & $\times$18  

& & $\phantom{0}$ & $\times$8 & -- & Fired clay & --\\
&&&&&&&\\
\multicolumn{10}{@{}l}{\textbf{Beaker}}\\
552 & -- & 0.68 & 0.12 & Saucer & P7--14 & -- & --  

& & -- & -- & --\\
790 & -- & 0.60 & 0.25 & U & P15 & & $\times$12 & --  

& & Quartzite-lump & -- & --\\
794 & 2.89 & 0.75 & 0.25 & Irreg. & P16 & & $\phantom{0}$ & $\times$3  

& & -- & -- & -- & --\\
\hline
\end{tabular}%
\end{minipage}
\end{sidewaystable}

```

**Table 2.4** Grooved ware and beaker features, their finds and radiocarbon dates. For a breakdown of the pottery assemblages see Tables I and III; for the flints see Tables II and IV; for the animal bones see Table V.

Context	Length	Breadth/ Diameter	Depth	Profile	Pottery	Flint	Animal Bones	Stone	Other	C14 Dates
	m	m	m							
<b>Grooved Ware</b>										
784	–	0.9	0.18	Sloping U	P1	×46	×8		×2 bone	2150 ±100 BC
785	–	1.00	0.12	Sloping U	P2–4	×23	×21	Hammerstone	–	–
962	–	1.37	0.20	Sloping U	P5–6	×48	×57	–	–	1990 ±80 BC (Layer 4) 1870 ±90 BC (Layer 1)
983	0.83	0.73	0.25	Stepped U	–	×18	×8	–	Fired clay	–
<b>Beaker</b>										
552	–	0.68	0.12	Saucer	P7–14	–	–	–	–	–
790	–	0.60	0.25	U	P15	×12	–	Quartzite-lump	–	–
794	2.89	0.75	0.25	Irreg.	P16	×3	–	–	–	–

## 3 Mathematical solutions

---

### 3.1 Why are we using amsthm.sty?

Many authors are already using this style file, so we have decided that rather than reinvent the wheel, we will make it part of our distribution. This means that at the top of the root file must include the following lines:

```
\documentclass{EngC}
\usepackage{amsmath}
\usepackage{amsthm}
```

As mentioned in Chapter 1, if your book does not use theorems, proofs, etc., then there is no need to include the amsthm package, but you do need to include these files to run this guide through L<sup>A</sup>T<sub>E</sub>X. Note that if you are also using amsmath.sty, it *must* precede amsthm.sty.

The instructions for amsthm.sty are documented separately in amsthdoc.pdf. We are including amsthm.sty and amsthdoc.pdf in this distribution for your convenience, but you may find more recent versions on the web. The following sections discuss the basic features, plus a few extras.

To save time, you may cut and paste the code in Appendix B into your root file. This is a comprehensive (but not necessarily a complete) list of theorem-like environments you may wish to use.

The amsthm commands used in this guide are detailed in Appendix C. They are simply a subset of commands from Appendix B; some illustrate unnumbered versions.

Please note that theorems, lemmas, corollaries, propositions, conjectures, criteria, algorithms, definitions, conditions, problems, examples, etc. should be numbered in a single sequence, either by chapter (Chapter 4 would have DEFINITION 4.1, LEMMA 4.2, LEMMA 4.3, PROPOSITION 4.4, COROLLARY 4.5) or by section (DEFINITION 4.1.1, LEMMA 4.1.2, LEMMA 4.1.3, PROPOSITION 4.1.4, COROLLARY 4.1.5).

To number these elements by chapter in this guide, we have used `\newtheorem{theorem}{Theorem}[chapter]`. If you prefer to have the elements numbered by section, replace `[chapter]` with `[section]`.

## 3.2 amsthm styles

If no `\theoremstyle` command is given, the style used will be `plain`. To specify different styles, divide your `\newtheorem` commands into groups and preface each group with the appropriate `\theoremstyle`.

### 3.2.1 amsthm plain style

The `plain` style is normally used for theorems, lemmas, corollaries, propositions, conjectures, criteria and algorithms. The `EngC` style calls for these to be numbered in the same sequence. The following example resets the theorem numbers for each chapter; lemmas follow in the same sequence. For demonstration purposes only, we have requested that corollaries remain unnumbered by using the starred version:

```
\theoremstyle{plain}% default
\newtheorem{theorem}{Theorem}[chapter]
\newtheorem{lemma}[theorem]{Lemma}
\newtheorem*{corollary}{Corollary}

\begin{theorem}
  Let the scalar function\ldots
\end{theorem}
\begin{lemma}[Tranah 2009]
  The first-order free surface amplitudes\ldots
\end{lemma}
\begin{lemma}[Normansell 2010]
  The exotic behaviours of Lagrangian\ldots
\end{lemma}
\begin{corollary}
  Let  $G$  be the free group on\ldots
\end{corollary}
```

will produce the following output:

THEOREM 3.1 *Let the scalar function...*

LEMMA 3.2 (Tranah 2009) *The first-order free surface amplitudes...*

LEMMA 3.3 (Normansell 2010) *The exotic behaviours of Lagrangian...*

COROLLARY *Let  $G$  be the free group on...*

Note that corollaries would normally be in the same numbering sequence as theorems and lemmas.

### 3.2.2 amsthm definition style

The definition style is normally used for definitions and conditions. It is EngC style to continue with the same numbering sequence as for theorems, lemmas, etc.:

```
\theoremstyle{definition}
\newtheorem{definition}[theorem]{Definition}
\newtheorem{condition}[theorem]{Condition}

\begin{definition}
  The series above is the Green function\ldots
\end{definition}
\begin{condition}
  Diagrams~3 and~4 contribute to coupling constant renormalization
  of the mean field contribution\ldots
\end{condition}
```

will produce the following output:

DEFINITION 3.4 The series above is the Green function. . .

CONDITION 3.5 Diagrams 3 and 4 contribute to coupling constant renormalization of the mean field contribution. . .

### 3.2.3 amsthm remark style

The remark style is normally used for remarks, notes, notation, claims, summary, acknowledgements, cases, conclusions. Authors are free to define their preferred numbering systems for these, but they must be separate from the theorem sequence.

```
\theoremstyle{remark}
\newtheorem{remark}{Remark}[chapter]
\newtheorem{notation}[remark]{Notation}
\newtheorem*{case}{Case}

\begin{remark}
  The absolute amplitude of a stratified wake\ldots
\end{remark}
\begin{notation}
  For a poset  $P$  and  $\pi, \sigma \in P$  with  $\pi < \sigma$ 
  we denote by  $[\pi, \sigma]$  the interval\ldots
\end{notation}
\begin{case}
  The profiles of quadratic fluctuations\ldots
\end{case}
```

will produce the following output:

*Remark 3.1* The absolute amplitude of a stratified wake...

*Notation 3.2* For a poset  $P$  and  $\pi, \sigma \in P$  with  $\pi < \sigma$  we denote by  $[\pi, \sigma]$  the interval...

*Case* The profiles of quadratic fluctuations...

### 3.3 Proofs

The proof environment is also part of the `amsthm` package, and provides a consistent format for proofs. For example,

```
\begin{proof}
  Use  $K_\lambda$  and  $S_\lambda$  to translate combinators
  into  $\lambda$ -terms. For the converse, translate
   $\lambda x \dots$  by  $[x] \dots$  and use induction
  and the lemma.
\end{proof}
```

produces the following:

*Proof* Use  $K_\lambda$  and  $S_\lambda$  to translate combinators into  $\lambda$ -terms. For the converse, translate  $\lambda x \dots$  by  $[x] \dots$  and use induction and the lemma.  $\square$

#### 3.3.1 Changing the word ‘Proof’ to something else

An optional argument allows you to substitute a different name for the standard ‘Proof’. To change the proof heading to read ‘Proof of the Pythagorean Theorem’, key the following:

```
\begin{proof}[Proof of the Pythagorean Theorem]
  Start with a generic right-angled triangle\dots
\end{proof}
```

which produces:

*Proof of the Pythagorean Theorem* Start with a generic right-angled triangle...  $\square$

#### 3.3.2 Typesetting a proof without a $\square$

This is not part of the `amsthm` package. Use the `proof*` version. For example,

```
\begin{proof*}
  The apparent virtual mass coefficient\dots
\end{proof*}
```

produces the following:

*Proof* The apparent virtual mass coefficient...

### 3.3.3 Placing the $\square$ after a displayed equation

To avoid the  $\square$  dropping onto the following line at the end of a proof,

```
\begin{proof}
  \ldots and, as we are all aware,
  \[
    E=mc^2. \quad \qedhere
  \]
\end{proof}
```

produces the following:

*Proof* ... and, as we are all aware,

$$E = mc^2. \quad \square$$

When used with the `amsmath` package, version 2 or later, `\qedhere` will position  $\square$  flush right; with earlier versions,  $\square$  will be spaced a quad away from the end of the text or display.

If `\qedhere` produces an error message in an equation, try using `\mbox{\qedhere}` instead.

### 3.3.4 Placing the $\square$ after a displayed eqnarray

This is also not part of the `amsthm` package. To enable this, you need to use the starred version of `proof`, and add both `\arrayqed` and `\arrayqedhere`, as shown in the following example:

```
\begin{proof*}
  The following equations prove the theorem:
  \arrayqed
  \begin{eqnarray}
    \epsilon &= -\frac{1}{2}U_0\frac{\mathrm{d}q'^2}{\mathrm{d}x} \\
    &= 10\nu\frac{q'^2}{\lambda^2}
  \end{eqnarray}
  \arrayqedhere
\end{proof*}
```

produces the following:

*Proof* The following equations prove the theorem:

$$\begin{aligned} \epsilon &= -\frac{1}{2}U_0\frac{\mathrm{d}q'^2}{\mathrm{d}x} \\ &= 10\nu\frac{q'^2}{\lambda^2} \end{aligned} \quad \square$$



### 3.4 Boxed equations

You may highlight an individual equation using the standard `\fbox` command as follows:

```
\begin{equation}
  \fbox{$
    \ell_{\mathrm{c}}(\alpha) = 2\alpha - \log \left( \mathrm{e}^{\alpha}
      + \cdots + \mathrm{e}^{4\alpha} \right)
  $}
\end{equation}
```

$$\ell_{\mathrm{c}}(\alpha) = 2\alpha - \log \left( \mathrm{e}^{\alpha} + \cdots + \mathrm{e}^{4\alpha} \right) \quad (3.1)$$



## **Part II**

---

### **Closing features**



## 4 Reference and bibliography lists

---

### 4.1 Automatic lists using BibTeX

There are three reference style options for the EngC design: Harvard (author–date), Vancouver (numbered), and IEEE (numbered); please consult with your editor as to which you should be using.

If you are using the multi-contributor option, you will get an unnumbered section heading ‘References’, otherwise it will be an unnumbered chapter heading.

If you switch from one reference style to another, you must delete all .aux and .bbl files first, or you will get some undefined errors, or worse.

This guide has used the Harvard author–date style to produce the reference list on page 52. Do not be alarmed that the log file contains several warnings such as LaTeX Warning: Label ‘MenshEst’ multiply defined. These are as a result of demonstrating the three reference styles; this will not happen when you have chosen just one.

#### 4.1.1 Harvard author–date style

<http://www.ctan.org/tex-archive/macros/latex/contrib/harvard/>

First, call in `harvard.sty`. This style file is supplied with various bibliography styles; we recommend using the `agsm` option. The bibliography file for this guide (`EngCguide.tex`) is called `percolation.bib`. Place the `\bibliography` command at the point where you would like the references to appear:

```
\usepackage[agsm]{harvard}
:
\begin{document}
:
% \renewcommand{\refname}{Bibliography}
\bibliography{percolation}
```

Note that if you uncomment the third line shown above, you can change the heading from ‘References’ to ‘Bibliography’. Next, L<sup>A</sup>T<sub>E</sub>X your book twice. Then run B<sub>I</sub>B<sub>T</sub>E<sub>X</sub> by executing the command

```
bibtex EngCguide
```

Finally, run your book through  $\text{\LaTeX}$  twice again. This series of runs will generate a file called `EngCguide.bbl`, which will then be included by `\bibliography{percolation}`.

Here are the basic citation commands available in the Harvard package; further details can be found in the documentation file `harvard.pdf`. Bear in mind that `Menshikov (1985)` or `(Menshikov 1985)` read best, depending on context:

<code>\citeasnoun{MenshEst}</code>	→ Menshikov (1985)
<code>\citeasnoun[Appendix B]{MenshEst}</code>	→ Menshikov (1985, Appendix B)
<code>\cite{MenshEst}</code>	→ (Menshikov 1985)
<code>\cite[Appendix B]{MenshEst}</code>	→ (Menshikov 1985, Appendix B)
<code>\possessivecite{MenshEst}</code>	→ Menshikov's (1985)
<code>\citeaffixed{MenshEst,Reimer}{e.g.}</code>	→ (e.g. Menshikov 1985, Reimer 2000)
<code>\citeyear*{MenshEst,Reimer}</code>	→ 1985, 2000
<code>\citeyear{MenshEst,Reimer}</code>	→ (1985, 2000)
<code>\citenam{MenshEst}</code>	→ Menshikov

Suppose you have cited 8 entries from the ‘percolation’ database, e.g. `\cite{MenshEst}`; `\cite{Kasym}`; `\cite{Reimer}`; `\cite{HamMaz94}`; `\cite{HamLower}`; `\cite{AiBar87}`; `\cite{MMS}`; and `\cite{HamAtomBond}`; the output will be just those 8 citations; see below.

### Output from harvard author–date style

- Aizenman, M. & Barsky, D. J. (1987), ‘Sharpness of the phase transition in percolation models’, *Comm. Math. Phys.* **108**, 489–526.
- Hammersley, J. M. (1957), ‘Percolation processes: Lower bounds for the critical probability’, *Ann. Math. Statist.* **28**, 790–795.
- Hammersley, J. M. (1961), ‘Comparison of atom and bond percolation processes’, *J. Mathematical Phys.* **2**, 728–733.
- Hammersley, J. M. & Mazzarino, G. (1994), ‘Properties of large Eden clusters in the plane’, *Combin. Probab. Comput.* **3**, 471–505.
- Kesten, H. (1990), Asymptotics in high dimensions for percolation, in G. R. Grimmett & D. J. A. Welsh, eds, ‘Disorder in Physical Systems: A Volume in Honour of John Hammersley’, Oxford University Press, pp. 219–240.
- Menshikov, M. V. (1985), ‘Estimates for percolation thresholds for lattices in  $\mathbf{R}^n$ ’, *Dokl. Akad. Nauk SSSR* **284**, 36–39.
- Menshikov, M. V., Molchanov, S. A. & Sidorenko, A. F. (1986), Percolation theory and some applications, in ‘Probability theory. Mathematical statistics. Theoretical cybernetics, Vol. 24 (Russian)’, Akad. Nauk SSSR Vsesoyuz. Inst. Nauchn. i Tekhn. Inform., pp. 53–110. Translated in *J. Soviet Math.* **42** (1988), no. 4, 1766–1810.
- Reimer, D. (2000), ‘Proof of the van den Berg–Kesten conjecture’, *Combin. Probab. Comput.* **9**, 27–32.

### Harvard author–date style – keying in your own reference list

You do not have to use  $\text{\BIBTeX}$  to generate your list of references; the above list may be keyed as follows:

```

\begin{harvardoutput}
\item Aizenman, M. \&\ Barsky, D.~J. (1987), ‘Sharpness...~489--526.
\item Hammersley, J.~M. (1957), ‘Percolation...~790--795.
\item Hammersley, J.~M. (1961), ‘Comparison of atom...~728--733.
\item Hammersley, J.~M. \&\ Mazzarino, G. (1994), ‘Properties...~471--505.
\item Kesten, H. (1990), Asymptotics in high dimensions...~219--240.
\item Menshikov, M.~V. (1985), ‘Estimates for percolation...~36--39.
\item Menshikov, M.~V., Molchanov, S.~A. \&\ Sidorenko, A.~F...1766--1810.
\item Reimer, D. (2000), ‘Proof of the van den Berg--Kesten...~27--32.
\end{harvardoutput}

```

#### 4.1.2 Vancouver numbered style

<http://www.ctan.org/tex-archive/biblio/bibtex/contrib/vancouver/>

First, call in the vancouver bibliography style file (`vancouver.bst`) as shown below. The bibliography file for this guide (`EngCguide.tex`) is called `percolation.bib`. Place the `\bibliography` command at the point where you would like the references to appear:

```

% \removesquarebraces
:
\begin{document}
:
\bibliographystyle{vancouver}
:
% \renewcommand{\refname}{Bibliography}
\bibliography{percolation}

```

Note that if you uncomment the first line, `\removesquarebraces`, the square braces will be removed from the final listing (but will remain in place for citations). If you uncomment the fourth line shown above, you can change the heading from ‘References’ to ‘Bibliography’. Next,  $\LaTeX$  your book twice. Then run  $\text{BIB}\text{T}\text{E}\text{X}$  by executing the command

```
bibtex EngCguide
```

Finally, run your book through  $\LaTeX$  twice again. This series of runs will generate a file called `EngCguide.bbl`, which will then be included by `\bibliography{percolation}`.

Here are the basic citation commands available in the Vancouver package; further details can be found in the documentation file `vancouver.pdf`. Note that you may have more than one entry within the `\cite` command:

```

\cite{MenshEst}           → [1]
\cite{MenshEst,Reimer}    → [1, 3]
\cite[Chapter~2]{MenshEst} → [1, Chapter 2]

```

Suppose you have cited 10 entries from the ‘percolation’ database, e.g. `\cite{MenshEst}`;

`\cite{Kasymp};\cite{Reimer};\cite{HamMaz94};\cite{HamLower};\cite{AiBar87};`  
`\cite{MMS};\cite{HamAtomBond};\cite{HamMaz83}` and `\cite{HamWelsh}`; the  
 output will be just those 10 citations; see below.

### Output from vancouver numbered style

- [1] Menshikov MV. Estimates for percolation thresholds for lattices in  $\mathbf{R}^n$ . Dokl Akad Nauk SSSR. 1985;284:36–39.
- [2] Kesten H. Asymptotics in high dimensions for percolation. In: Grimmett GR, Welsh DJA, editors. Disorder in Physical Systems: A Volume in Honour of John Hammersley. Oxford University Press; 1990. p. 219–240.
- [3] Reimer D. Proof of the van den Berg–Kesten conjecture. Combin Probab Comput. 2000;9:27–32.
- [4] Hammersley JM, Mazzarino G. Properties of large Eden clusters in the plane. Combin Probab Comput. 1994;3:471–505.
- [5] Hammersley JM. Percolation processes: Lower bounds for the critical probability. Ann Math Statist. 1957;28:790–795.
- [6] Aizenman M, Barsky DJ. Sharpness of the phase transition in percolation models. Comm Math Phys. 1987;108:489–526.
- [7] Menshikov MV, Molchanov SA, Sidorenko AF. Percolation theory and some applications. In: Probability theory. Mathematical statistics. Theoretical cybernetics, Vol. 24 (Russian). Akad. Nauk SSSR Vsesoyuz. Inst. Nauchn. i Tekhn. Inform.; 1986. p. 53–110. Translated in *J. Soviet Math.* **42** (1988), no. 4, 1766–1810.
- [8] Hammersley JM. Comparison of atom and bond percolation processes. J Mathematical Phys. 1961;2:728–733.
- [9] Hammersley JM, Mazzarino G. Markov fields, correlated percolation, and the Ising model. In: The mathematics and physics of disordered media (Minneapolis, Minn., 1983). vol. 1035 of Lecture Notes in Math. Springer; 1983. p. 201–245.
- [10] Hammersley JM, Welsh DJA. First-passage percolation, subadditive processes, stochastic networks, and generalized renewal theory. In: Proc. Internat. Res. Semin., Statist. Lab., Univ. California, Berkeley, Calif. Springer; 1965. p. 61–110.

### Vancouver numbered style – keying in your own reference list

You do not have to use  $\text{\LaTeX}$  to generate your list of references; the above list may be keyed as follows. Note that you need to specify the number of references (10 in this case) so that  $\text{\LaTeX}$  can work out how wide the margin needs to be.

```
\begin{vancouveroutput}{10}
\bibitem{} Menshikov MV. Estimates for percolation...1985;284:36--39.
\bibitem{} Kesten H. Asymptotics in high dimensions...1990. p.~219--240.
\bibitem{} Reimer D. Proof of the van den Berg--Kesten...2000;9:27--32.
\bibitem{} Hammersley JM, Mazzarino G. Properties...1994;3:471--505.
\bibitem{} Hammersley JM. Percolation processes:...1957;28:790--795.
\bibitem{} Aizenman M, Barsky DJ. Sharpness of the phase...1987;108:489--526.
\bibitem{} Menshikov MV, Molchanov SA, Sidorenko AF. Percolation...1766--1810.
```



```

\bibitem{} Hammersley JM. Comparison of atom and bond...1961;2:728--733.
\bibitem{} Hammersley JM, Mazzarino G. Markov fields,...p.~201--245.
\bibitem{} Hammersley JM, Welsh DJA. First-passage percolation,...p.~61--110.
\end{vancouveroutput}

```

### 4.1.3 IEEE numbered style

<http://www.ctan.org/tex-archive/macros/latex/contrib/IEEEtran/bibtex/>

First, call in the IEEE bibliography style file (IEEEtran.bst) as shown below. The bibliography file for this guide (EngCguide.tex) is called percolation.bib. Place the `\bibliography` command at the point where you would like the references to appear:

```

% \removesquarebraces
:
\begin{document}
:
\bibliographystyle{IEEEtran}
:
% \renewcommand{\refname}{Bibliography}
\bibliography{percolation}

```

Note that if you uncomment the first line, `\removesquarebraces`, the square braces will be removed from the final listing (but will remain in place for citations). If you uncomment the fourth line shown above, you can change the heading from ‘References’ to ‘Bibliography’. Next,  $\LaTeX$  your book twice. Then run Bib $\TeX$  by executing the command

```
bibtex EngCguide
```

Finally, run your book through  $\LaTeX$  twice again. This series of runs will generate a file called EngCguide.bbl, which will then be included by `\bibliography{percolation}`.

Here are the basic citation commands available in the IEEEtran package; further details can be found in the documentation file IEEEtran\_bst\_HOWTO.pdf. Note that you may have more than one entry within the `\cite` command:

```

\cite{MenshEst}           → [1]
\cite{MenshEst,Reimer}    → [1, 3]
\cite[Chapter~2]{MenshEst} → [1, Chapter 2]

```

Suppose you have cited 10 entries from the ‘percolation’ database, e.g. `\cite{MenshEst}`; `\cite{Kasym}`; `\cite{Reimer}`; `\cite{HamMaz94}`; `\cite{HamLower}`; `\cite{AiBar87}`; `\cite{MMS}`; `\cite{HamAtomBond}`; `\cite{HamMaz83}` and `\cite{HamWelsh}`; the output will be just those 10 citations; see below.

### Output from IEEEtran numbered style

- [1] M. V. Menshikov, "Estimates for percolation thresholds for lattices in  $\mathbf{R}^n$ ," *Dokl. Akad. Nauk SSSR*, vol. 284, pp. 36–39, 1985.
- [2] H. Kesten, "Asymptotics in high dimensions for percolation," in *Disorder in Physical Systems: A Volume in Honour of John Hammersley*, G. R. Grimmett and D. J. A. Welsh, Eds. Oxford University Press, 1990, pp. 219–240.
- [3] D. Reimer, "Proof of the van den Berg–Kesten conjecture," *Combin. Probab. Comput.*, vol. 9, pp. 27–32, 2000.
- [4] J. M. Hammersley and G. Mazzarino, "Properties of large Eden clusters in the plane," *Combin. Probab. Comput.*, vol. 3, pp. 471–505, 1994.
- [5] J. M. Hammersley, "Percolation processes: Lower bounds for the critical probability," *Ann. Math. Statist.*, vol. 28, pp. 790–795, 1957.
- [6] M. Aizenman and D. J. Barsky, "Sharpness of the phase transition in percolation models," *Comm. Math. Phys.*, vol. 108, pp. 489–526, 1987.
- [7] M. V. Menshikov, S. A. Molchanov, and A. F. Sidorenko, "Percolation theory and some applications," in *Probability theory. Mathematical statistics. Theoretical cybernetics, Vol. 24 (Russian)*. Akad. Nauk SSSR Vsesoyuz. Inst. Nauchn. i Tekhn. Inform., 1986, pp. 53–110, translated in *J. Soviet Math.* **42** (1988), no. 4, 1766–1810.
- [8] J. M. Hammersley, "Comparison of atom and bond percolation processes," *J. Mathematical Phys.*, vol. 2, pp. 728–733, 1961.
- [9] J. M. Hammersley and G. Mazzarino, "Markov fields, correlated percolation, and the Ising model," in *The mathematics and physics of disordered media (Minneapolis, Minn., 1983)*, ser. Lecture Notes in Math. Springer, 1983, vol. 1035, pp. 201–245.
- [10] J. M. Hammersley and D. J. A. Welsh, "First-passage percolation, subadditive processes, stochastic networks, and generalized renewal theory," in *Proc. Internat. Res. Semin., Statist. Lab., Univ. California, Berkeley, Calif.* Springer, 1965, pp. 61–110.

### IEEEtran numbered style – keying in your own reference list

You do not have to use BIB<sub>T</sub><sub>E</sub>X to generate your list of references; the above list may be keyed as follows. Note that you need to specify the number of references (10 in this case) so that L<sub>A</sub>T<sub>E</sub>X can work out how wide the margin needs to be.

```
\begin{IEEEtranoutput}{10}
\bibitem{} M.~V. Menshikov, "Estimates for percolation...pp.~36--39, 1985.
\bibitem{} H.~Kesten, "Asymptotics in high dimensions for...pp.~219--240.
\bibitem{} D.~Reimer, "Proof of the van den Berg--Kesten...pp.~27--32, 2000.
\bibitem{} J.~M. Hammersley and G.~Mazzarino, "Properties...pp.~471--505, 1994.
\bibitem{} J.~M. Hammersley, "Percolation processes: Lower...pp.~790--795, 1957.
\bibitem{} M.~Aizenman and D.~J. Barsky, "Sharpness of the...pp.~489--526, 1987.
\bibitem{} M.~V. Menshikov, S.~A. Molchanov, and A.~F. Sidorenko,...no.~4, 1766--1810.
\bibitem{} J.~M. Hammersley, "Comparison of atom and bond...pp.~728--733, 1961.
\bibitem{} J.~M. Hammersley and G.~Mazzarino, "Markov fields,...pp.~201--245.
\bibitem{} J.~M. Hammersley and D.~J.~A. Welsh, "First-passage...pp.~61--110.
\end{IEEEtranoutput}
```

# 5 Indexes

---

## 5.1 Creating a single index using makeidx.sty

To generate a single index, normally a subject index, the commands would take the form:

```
\index{diffraction}  
\index{force!hydrodynamic}  
\index{force!interactive}
```

The following commands are then required in the preamble:

```
\usepackage{makeidx}  
\makeindex
```

and at the point you wish your index to appear,

```
\printindex
```

Run your book through  $\text{\LaTeX}$  enough times so that the labels, etc., are stable. Then execute the command:

```
makeindex EngCguide
```

To include the index, you need to run  $\text{\LaTeX}$  one more time.

## 5.2 Creating multiple indexes using multind.sty

This guide has been prepared using `multind.sty`. This style file redefines the `\makeindex`, `\index` and `\printindex` commands to deal with multiple indexes.

Suppose you want to create an author index and a subject index. The entries should be in the text as usual, but take the following form:

```
\index{authors}{Young, P.D.F.}  
\index{authors}{Tranah, D.A.}  
\index{authors}{Peterson, K.}  
\index{subject}{diffraction}  
\index{subject}{force!hydrodynamic}  
\index{subject}{force!interactive}
```

In the preamble, you need to add the following lines:

```
\usepackage{multind}\ProvidesPackage{multind}
\makeindex{authors}
\makeindex{subject}
```

It is crucial to add the command `\ProvidesPackage{multind}`; this will send a message to the class file to re-style the index into the EngC style. You will get a warning in your log file:

```
LaTeX Warning: You have requested package ‘’,
                but the package provides ‘multind’.
```

which can be ignored. At the point where you wish your indexes to appear, you then need the commands:

```
\printindex{authors}{Author index}
\printindex{subject}{Subject index}
```

Run your book through  $\text{\LaTeX}$  enough times so that the labels, etc., are stable. Then execute the commands:

```
makeindex authors
makeindex subject
```

To include the indexes, you need to run  $\text{\LaTeX}$  one more time.

### 5.3 Creating multiple indexes using `index.sty`

This style file allows you to define new indexes. Suppose you want to create an author index as well as a normal subject index. The entries should be in the text as usual, but take the following form:

```
\index[aut]{Young, P.D.F.}
\index[aut]{Tranah, D.A.}
\index[aut]{Peterson, K.}
\index{diffraction}
\index{force!hydrodynamic}
\index{force!interactive}
```

To create the extra author index, you need to have the following lines in the preamble:

```
\usepackage{index}
\makeindex
\newindex{aut}{adx}{and}{Author index}
```

At the point where you wish your indexes to appear, use:

```
\printindex[aut]
\printindex
```

Run your book through L<sup>A</sup>T<sub>E</sub>X enough times so that the labels, etc., are stable. Then execute the commands:

```
makeindex -o EngCguide.and EngCguide.adx
makeindex EngCguide
```

To include the indexes, you need to run L<sup>A</sup>T<sub>E</sub>X one more time.

### 5.3.1 Caution – from the authors of index.sty

In order to implement `index.sty`, it's been necessary to modify a number of L<sup>A</sup>T<sub>E</sub>X commands seemingly unrelated to indexing, namely, `\@starttoc`, `\raggedbottom`, `\flushbottom`, `\addcontents`, `\markboth`, and `\markright`. Naturally, this could cause incompatibilities between `index.sty` and any style files that either redefine these same commands or make specific assumptions about how they operate.

The redefinition of `\@starttoc` is particularly bad, since it introduces an incompatibility with the AMS document classes. This will be addressed soon.

In the current implementation, `index.sty` uses one output stream for each index. Since there are a limited number of output indexes, this means that there is a limit on the number of indexes you can have in a document. There is more information on this in `index.dtx` which is part of the `index.sty` distribution.

*For these reasons, whilst all care has been taken to deal with these changes in `EngC.cls`, if you do find incompatibilities with other files, please contact us at [texline@cambridge.org](mailto:texline@cambridge.org) with your source files, class and style files, and log file.*



# Appendix A Typesetting appendices

---

## A.1 Single-contributor books

### A.1.1 How to typeset one appendix

If you have just one appendix, say `appendix.tex`, you will want to generate a chapter head ‘Appendix’ rather than ‘Appendix A’. Use `\oneappendix` in the main file, as follows:

```
\oneappendix
\include{appendix}
```

### A.1.2 How to typeset several appendices

The coding used to generate the appendices in this guide is as follows:

```
\appendix
\include{appendixA}
\include{appendixB}
\include{appendixC}
```

## A.2 Multi-contributor books

### A.2.1 How to typeset one appendix

If you have just one appendix, it will be the next section head and you should include the following code at the end of your chapter:

```
\oneappendix
\section{Appendix heading}
\subsection{Subheading}
\endappendix
```

You will need to add `\endappendix` if you have further section heads in this chapter.

### A.2.2 How to typeset several appendices

The following code will generate Appendix A and Appendix B at the end of your chapter:

```
\appendix
\section{Appendix heading}
\subsection{Subheading}
:
\section{Next appendix heading}
\subsection{Next subheading}
\endappendix
```

Again, you will need to add `\endappendix` if you have further section heads in this chapter.

## A.3 Numbering systems

Equations in appendices will be numbered as follows:

$$E = mc^2, \tag{A.1}$$

and figure captions as follows:

**Figure A.1** Similarity solutions.



## Appendix B amsthm commands

---

The following code may be cut and pasted into your root file. Assuming you have included `amsthm.sty`, it will number your theorems, definitions, etc. in the same numbering sequence and by chapter, e.g. DEFINITION 4.1, LEMMA 4.2, LEMMA 4.3, PROPOSITION 4.4, COROLLARY 4.5.

If you prefer to have the elements numbered by section, e.g. DEFINITION 4.1.1, LEMMA 4.1.2, LEMMA 4.1.3, PROPOSITION 4.1.4, COROLLARY 4.1.5, replace `[chapter]` on line 2 with `[section]`.

```
\theoremstyle{plain}% default
\newtheorem{theorem}{Theorem}[chapter]
\newtheorem{lemma}[theorem]{Lemma}
\newtheorem{corollary}[theorem]{Corollary}
\newtheorem{proposition}[theorem]{Proposition}
\newtheorem{conjecture}[theorem]{Conjecture}
\newtheorem{criterion}[theorem]{Criterion}
\newtheorem{algorithm}[theorem]{Algorithm}

\theoremstyle{definition}
\newtheorem{definition}[theorem]{Definition}
\newtheorem{condition}[theorem]{Condition}

\theoremstyle{remark}
\newtheorem{remark}{Remark}[chapter]
\newtheorem{note}[remark]{Note}
\newtheorem{notation}[remark]{Notation}
\newtheorem{claim}[remark]{Claim}
\newtheorem{summary}[remark]{Summary}
\newtheorem{acknowledgement}[remark]{Acknowledgement}
\newtheorem{case}[remark]{Case}
\newtheorem{conclusion}[remark]{Conclusion}
```

# Appendix C The root file for this guide

---

```
% EngCguide.tex
% for the suite of standard Cambridge designs
% 2011/02/03, v1.10

\NeedsTeXFormat{LaTeX2e}[1996/06/01]

\documentclass{EngC}
% \documentclass[multi]{EngC} % multi-contributor option
% \documentclass[prodtf]{EngC}% if you have helvetica neue condensed fonts

\usepackage[rightcaption,raggedright]{sidecap}% for side captions
\usepackage{framed} % for floatingboxes
\usepackage{soul} % for letterspacing in theorem-style headings

% for the Harvard author-date referencing system
\usepackage{agsm}{harvard}

% if you are using either vancouver.bst or IEEEtran.bst and wish to remove
% square braces in the reference list, uncomment the line below
% \removesquarebraces

\usepackage{rotating}
\usepackage{floatpag}
\rotfloatpagestyle{empty}

% \usepackage{amsmath}% if you are using this package,
% % it must be loaded before amsthm.sty
\usepackage{amsthm}
% \usepackage{txfonts}% times font (used to produce EngCguide.pdf)
% % this package must be loaded after amsthm.sty
\usepackage{graphicx}

% indexes
% uncomment the relevant set of commands

% for a single index
% \usepackage{makeidx}
% \makeindex

% for multiple indexes using multind.sty
\usepackage{multind}\ProvidesPackage{multind}
\makeindex{authors}
\makeindex{subject}
```

---

```

% for multiple indexes using index.sty
% \usepackage{index}
% \newindex{aut}{adx}{and}{Author index}
% \makeindex

\newcommand\cambridge{EngC}

% see chapter 3 for details
\theoremstyle{plain}% default
\newtheorem{theorem}{Theorem}[chapter]
\newtheorem{lemma}[theorem]{Lemma}
\newtheorem*{corollary}{Corollary}

\theoremstyle{definition}
\newtheorem{definition}[theorem]{Definition}
\newtheorem{condition}[theorem]{Condition}

\theoremstyle{remark}
\newtheorem{remark}{Remark}[chapter]
\newtheorem{notation}[remark]{Notation}
\newtheorem*{case}{Case}

\hyphenation{line-break line-breaks docu-ment tri-angle cam-bridge amsthdoc
  cambridgemods baseline-skip author authors cambridgestyle en-vir-on-ment polar}

\setcounter{tocdepth}{2}% the toc normally lists sections;
% for the purposes of this document, this has been extended to subsections

%%%%
%% \includeonly{chap2}
%%%%

\begin{document}
\title[Subtitle, if you have one]
  {LaTeX2e guide for authors using the \cambridge\ design}

\author{ALI WOOLLATT\[\[3\baselineskip]
  This guide was compiled using \hbox{\cambridge.cls \version}\[\[3\baselineskip]
  The latest version can be downloaded from:
  https://authornet.cambridge.org/information/productionguide/
  LaTeX\_files/\cambridge.zip}

\frontmatter
\maketitle
\tableofcontents
\listoffigures
\listoftables
\listoffloatingboxes
\listofcontributors
% \editedlistofcontributors
\include{notation}

\mainmatter
\part{Getting started}

```

```

\include{chap1}% introduction
\include{chap2}% features of the \cambridge\ class file
\include{chap3}% mathematical solutions

\part{Closing features}
\include{chap4}% references and bibliographies
\include{chap5}% single and multiple indexes

\backmatter
% if you only have one appendix, use \oneappendix instead of \appendix
\appendix
\include{appendixA}
\include{appendixB}
\include{appendixC}
\endappendix

% insert a blank line to the toc list
\addtocontents{toc}{\vspace{\baselineskip}}
\theendnotes

% bibliography style files
% if you are using harvard, the style is specified with the \usepackage command
% \bibliographystyle{vancouver}% uncomment for vancouver style
% \bibliographystyle{IEEEtran} % uncomment for IEEE style

% \renewcommand{\refname}{Bibliography}% if you prefer this heading
\bibliography{percolation}\label{refs}

\cleardoublepage

% indexes

% for a single index
% \printindex

% for multiple indexes using multind.sty
\printindex{authors}{Author index}
\printindex{subject}{Subject index}

% for multiple indexes using index.sty
% \printindex[aut]
% \printindex

\end{document}

```

# Notes

## Chapter 2

- 1 Lewis Fry Richardson (1881–1953).

## References

- Aizenman, M. & Barsky, D. J. (1987), 'Sharpness of the phase transition in percolation models', *Comm. Math. Phys.* **108**, 489–526.
- Hammersley, J. M. (1957), 'Percolation processes: Lower bounds for the critical probability', *Ann. Math. Statist.* **28**, 790–795.
- Hammersley, J. M. (1961), 'Comparison of atom and bond percolation processes', *J. Mathematical Phys.* **2**, 728–733.
- Hammersley, J. M. & Mazzarino, G. (1983), Markov fields, correlated percolation, and the Ising model, in 'The mathematics and physics of disordered media (Minneapolis, Minn., 1983)', Vol. 1035 of *Lecture Notes in Math.*, Springer, pp. 201–245.
- Hammersley, J. M. & Mazzarino, G. (1994), 'Properties of large Eden clusters in the plane', *Combin. Probab. Comput.* **3**, 471–505.
- Hammersley, J. M. & Welsh, D. J. A. (1965), First-passage percolation, subadditive processes, stochastic networks, and generalized renewal theory, in 'Proc. Internat. Res. Semin., Statist. Lab., Univ. California, Berkeley, Calif.', Springer, pp. 61–110.
- Kesten, H. (1990), Asymptotics in high dimensions for percolation, in G. R. Grimmett & D. J. A. Welsh, eds, 'Disorder in Physical Systems: A Volume in Honour of John Hammersley', Oxford University Press, pp. 219–240.
- Menshikov, M. V. (1985), 'Estimates for percolation thresholds for lattices in  $\mathbf{R}^n$ ', *Dokl. Akad. Nauk SSSR* **284**, 36–39.
- Menshikov, M. V., Molchanov, S. A. & Sidorenko, A. F. (1986), Percolation theory and some applications, in 'Probability theory. Mathematical statistics. Theoretical cybernetics, Vol. 24 (Russian)', Akad. Nauk SSSR Vsesoyuz. Inst. Nauchn. i Tekhn. Inform., pp. 53–110. Translated in *J. Soviet Math.* **42** (1988), no. 4, 1766–1810.
- Reimer, D. (2000), 'Proof of the van den Berg–Kesten conjecture', *Combin. Probab. Comput.* **9**, 27–32.

## Author index

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