Quick Guide – Accessible learning material written in LaTeX

Accessibility for LaTeX Authors

The guide is intended for authors who use LaTeX to write learning material.

We recognise that LaTeX is very powerful to write digital advanced mathematics and technical texts. Unfortunately, PDF documents generated through LaTeX are not accessible to all users, and there are currently no LaTeX packages that can render fully accessible PDF.

You can take some simple steps to ensure your PDF documents are well structured (see Structuring LaTeX-generated PDF), but this will not be sufficient to fully comply with accessibility requirements. At the University of Aberdeen, we recommend that you provide an HTML version of your learning material, in addition to the PDF version.

Well-designed HTML documents comply with accessibility requirements, whilst maintaining the integrity of the mathematical text.

Depending on your situation, the most suitable approach to generate the HTML file will vary. This guide~~,~~ provides advice and guidance for two situations: if you have existing LaTeX-written material and you wish to convert it into HTML (see Existing lecture material: converting tex into HTML), or if you need to write new material (see New lecture material: using RMarkdown and Bookdown).

We recognise that addressing the accessibility of LaTeX-written learning material is challenging and time-consuming. If you need further support and information, please contact elearning@abdn.ac.uk.

Structuring LaTeX-generated PDF

Try to follow the following guidelines when generating a PDF for your lecture material.

Sections

Use \section{} and \subsection{} to structure your document.

Table of contents

Always generates a table of contents in your documents: \tableofcontents.

Choice of font

Use a sans serif family of font: \renewcommand*{\familydefault}{\sfdefault} in the preamble.

Line spacing

Implement a 1.5 linespread throughout your document: \linespread{1.5} in the preamble.

Figures and tables

Always embed your figures and tables within a figure or table environment and include a descriptive caption.

```
\begin{figure}
```

```
\caption[Short Title]{Title: description of the figure}

\end{figure}
```

Internal and external links

Use the hyperref package to colour the links within the document, e.g.:

```
\usepackage{hyperref}

\hypersetup{

colorlinks=true,

urlcolor=some colour,

anchorcolor= some colour,

linkcolor= some colour}
```

Existing lecture material: converting tex into HTML

If you have learning material that has already been written in LaTeX, then you may want to consider converting the tex file into HTML through one of the following methods.

Conversion packages are tools in development, and all have their limitations. You will very likely have a number of structure and syntax errors, which you will need to fix manually. The more complex your LaTeX preamble, the more likely you are to get errors. However, errors will not affect the integrity of the mathematics, which will be preserved.

Conversion of LaTeX notes into HTML

At the University of Aberdeen, we have tested and devised guidance for two conversion software: chirun and LaTeXML.

Chirun is a web interface developed by the University of Newcastle which generates a ZIP file containing the HTML version of the tex file uploaded.

LaTeXML is a command line tool to convert tex into xml. See our Guide to Using LaTeXML.

Conversion of Beamer Slides

Conversion of Beamer slides are currently only supported by Chirun.

There are other packages, for which we have not created guidance yet, such as lwrap (CTAN package to convert from LaTeX to HTML), tex4ht or plasTeX (a converter written in python, on which Chirun is built).

New lecture material: using RMarkdown and Bookdown

If you need to create new learning material, you may want to consider using an alternative to LaTeX.

At the University of Aberdeen, we recommend you use RMarkdown or Bookdown, which are lightweight markup languages.

RMarkdown and Bookdown scripts can be complied in both PDF and HTML formats, and the mathematical equations in markdown are written in LaTeX.

RMarkdown will be best suited for short documents and slides, while Bookdown will be best suited for long documents.

We recommend that you write your RMarkdown/Bookdown scripts in RStudio. You will need to install R, then the RMarkdown and Bookdown packages in RStudio. You will find detailed instructions on how to get started on the Scottish Maths Support Network website, under 'Software detailed guide'.

We are in the process of compiling guides, templates and workshops for training in RMarkdown/Bookdown. Please get in touch if you are interested, or would like further information.

Further Resources

- Emma Cliffe, University of Bath, Accessible maths: From retrofitting to inclusive design? https://people.bath.ac.uk/cspehj/slides/AccessibleMathsRetroToInc/index.html#/
- Pandoc: https://pandoc.org/
- Chirun: https://chirun.org.uk/
- RMarkdown The Definitive Guide: https://bookdown.org/yihui/rmarkdown/
- Bookdown Authoring Books and Technical Documents with R Markdown: https://bookdown.org/yihui/bookdown/
- RStudio and RMarkdown cheatsheets
- SMSN instructions for installing RStudio and RMarkdown: https://www.scottish-msn.org.uk/events/2023/rmd-workshop-details