NREL Dummy Report

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Executive Summary

This document is a guide to writing documents for publication by NREL using the LaTeX document preparation system. LaTeX is not WYSIWYG and has different reviewing and editing tools compared to typical word processing software. For this reason special care has to be taken when preparing NREL documents in LaTeX.

This document serves both as a guide to implementing NREL's style and formatting guidelines in LaTeX, and as a template. This document is intended for people with some familiarity with LaTeX.

Acknowledgments

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1 Dummy chapter

1.1 Creating Content

1.1.1 Front, main, and back matter

NREL's convention is to have Roman numerals in the front matter, and then arabic numerals in the main matter of the document (after the tables of contents, figures and tables). Tables and figures in the front matter are also numbered differently (Table A, B, C, ...) than in the main matter (Table 1, 2, 3, ...).

This change in page and float numbering is implemented using the `\frontmatter`, `\mainmatter`, and `\backmatter` commands at the start of these sections of the document:

```
\begin{document}

\maketitle
\frontmatter
...
\tableofcontents
\clearpage
\listoffigures
\listoftables
\mainmatter
...
\backmatter
\end{document}
```

1.2 Creating a file structure

Your main file should be called *main.tex*. This helps editors and coauthors identify where to start. Then, use `input` to import other files into your main file at compilation.

For example, each of the chapters in this report is in separate files, called *WhatIsLatex* (Chapter 1), *NRELRequirements.tex* (Chapter 2), *LatexAtNREL.tex* (Chapter 3), and so-on. In the example available on Github, they are stored in the *files* directory. *main.tex* then looks like this:

```
...
\begin{document}
% content
\input{files/WhatIsLatex}
\input{files/NRELRequirements}
\input{files/LatexAtNREL}
...
```

1.3 Best practice in writing a document in LaTeX

Create a structure before you get too far. Authors will find it easier to write documents and make changes if they separate the content of the document from the structure.

1. Each new LaTeX document should be placed in it's own directory.

2. Create a main LaTeX file that just contains the preamble, custom commands and uses `input` to call the content. See Section 1.2 for an example where each `chapter` is contained in its own file. In an article, each `section` could be contained in its own file.

3. Keep the number of packages used to a minimum. If authors feel that something is desperately missing, they can contact the maintainers of the *nrel.cls* file. Not all packages can be used as they lack compatibility.

Focus on content, not appearance. Don't spend hours trying to adjust fonts, headers or spacing between lines.

1. The document produced should meet NREL's requirements if it is compiled using *nrel.cls*.

2. Don't throw in lots of `clearpages` or other commands to push material around. LaTeX is designed to handle that.

3. Resist the temptation to add or subtract space, change lengths or do other things to modify the layout.

4. Write!

1.4 Dummy section

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1. No need to maintain a local version of LaTeX

2. Everyone uses the same version of LaTeX

3. Editors and reviewers can work in a user-friendly environment

4. There is an always-on "track changes" feature

5. Secure hosting of documents within the NREL domain

6. Ability to download source documents for archiving

2   Another dummy chapter

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- Meteorological masts and in-situ point measurements
  - Sonic anemometers
  - Pressure-temperature-humidity
- Remote sensing
  - Sodar and radar radio acoustic sounding system)
  - Ka-band and X-band radar
  - A diversity of lidars (e.g., ground-based, nacelle-mounted, scanners, profilers)
  - Field-particle-image-velocimetry-type systems
  - Satellite imaging
- Other instruments
  - Radiosondes and sounding systems (difficult with the Federal Aviation Administration; labor-intensive)
  - Eddy covariance (surface flux stations) both upwind and throughout the wind plant
  - Ceilometer for planetary boundary layer heights
  - SCADA (performance/operational data, loads)
  - Upwelling/downwelling radiation sensors
  - Sensors for surface properties (e.g. soil moisture/temperature, surface albedo,...)
  - Tethered lifting systems
  - Airborne measurement systems and unmanned aerial vehicles
- Other advice
  - Plan for backup units, (re)calibration of instruments, maintenance/downtime, data formatting, and time synchronization.

3 Yet another dummy chapter

3.0.1 Citations

Use `bibtex` to organize references and store them in a single file (e.g. `/Documents/bibliography/bibliography.bib`). The bibliography will then contain entries with 'keys' for each source, like `Lamport_1986_a`.

Authors can then insert citations to this key throughout their document, using different styles of citation. Citations are generated using the `biblatex` package, which also formats references in the correct style. Ways to generate citations are described in the `biblatex` documentation, and include:

- `\cite{jcs2020_feil}` prints Feil 2020.

- `\citep{jcs2020_feil}` prints (Feil 2020).

- `\citet{jcs2020_feil}` prints Feil (2020).

To cite URLs, use the 'misc' style. For example, the bibtex entry for http://tex.stackexchange.com **texstackexchange** looks like this:

```
@misc{texstackexchange,
      Author = {Anon.},
      Howpublished = {Accessed July 21, 2014: \url{http://tex.stackexchange.com}},
      Title = {\TeX -- LaTeX Stack Exchange},
      Year = {2014}}
```

This format will allow you to include the date on which a URL was accessed.

The citations should work with journal articles (**Clifton_2013_a**), books (**Knuth_1984_a**; **Lamport_1986_a**; **chicago**), technical reports (**TechReportTest**), and URLs (**texstackexchange**). Any unknown publication types will be formatted using the 'misc' type.

3.0.2 Including computer code

The `listings` package has been loaded. Note: this does not work if the 'Draft' document option is used.

To change the syntax highlighting use `\lstset{language=[dialect]language,columns=fullflexible,keepspace` before each listing where the language changes. For more details see the `lstlisting` documentation.

3.0.3 NREL-style bibliographies

NREL uses "Chicago A" style-references. The *nrel.cls* file uses Biblatex to produce these references automatically.

To include a bibliography in the document give the bibliography file location in the preamble, and insert the bibliography at the appropriate location:

```
% give the bibliography file location
\bibliography{files/bibliography.bib}
...
\begin{document}
...
% insert the bibliography into the document
\cleardoublepage
\label{sec:Bib}
\printbibliography
...
\end{document}
```

Figure 1. Very pretty picture Debnath et al. 2017; Brock et al. 1995; Krishnamurthy et al. 2017

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(a) subfigure on the let

(b) subfigure on the let

Figure 2. Another pretty figure, this time with two pictures.

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A Included packages

Nunc sed pede. Praesent vitae lectus. Praesent neque justo, vehicula eget, interdum id, facilisis et, nibh. Phasellus at purus et libero lacinia dictum. Fusce aliquet. Nulla eu ante placerat leo semper dictum. Mauris metus. Curabitur lobortis. Curabitur sollicitudin hendrerit nunc. Donec ultrices lacus id ipsum.

Table A.1. Packages loaded by the NREL classes.

Package	Options	Functionality
amsfonts, amssymb		supplies AMS fonts, which are useful for mathematics
babel	english	activates language-appropriate hyphenation rules
booktabs		improves the formatting of tables
caption		required to generate captions for floats
courier		changes fonts
fontenc	T1	enables direct typing of international characters
geometry		sets page size and margins
graphicx		graphics handling, including *.eps* figures
helvet	scaled=0.83	sets helvetica as the default sans-serif font, with correct scaling to match the serif font size
hyphenat		improves spacing and breaking of hyphenated words
listings		enables the inclusion of high-quality computer code listings
mathptmx		changes fonts
nag		checks that packages are up to date and looks for bad habits in LaTeX code.
parskip		required for better spacing
pdfcomment		required for tool-tips. Also calls the `hyperref` package
setspace		required for better spacing
subcaption		provides the `subfigure` environment to produce sub figures
tocloft		improved table of contents and list of figures/tables in memoir documents
tocbibind	nottoc, notlot, notlof	Add bibliography/index/contents to Table of Contents in memoir documents
todonotes		inline and margin to-do notes
xcolor		Driver-independent color extensions for LaTeX and pdfLaTeX