Publishing PNNL Reports in LaTeX | *The PNNL Document Class*

(Click on the tabs above for more information on each topic. Some tabs also have tabbed subtopics.)

Welcome to the PNNL LaTeX Document Class!

Welcome to the use of the new PNNL.cls file. We've made the process of preparing your report for publication as simple as possible, and hope you'll enjoy the process. For those of you who are familiar with LaTeX you'll see that we've made very few changes from standard LaTeX commands. The few new commands are shown in this documentation.

If you need help after you read this documentation, you may send email to Colleen Winters at colleen.winters@pnnl.gov or Mike Parker at mike.parker@pnnl.gov.

If possible please send a small file demonstrating the problem.

Files in this package, and what they do

pnnl.cls Document class file

Docs.pdf Documentation (this document)

fonts.zip Repository for fonts: put them in a `\fonts` directory one level up from the directory in which you are working.

template.tex A file containing all the commands that are unique to this style, with explanations of how to use them

SamplePages.tex/.pdf Compare SamplePages.tex with SamplePages.pdf to see how to enter commands correctly.

Illustration Files for PNNL style FrontCoverGraphic.jpg, BackDoverGraphic.jpg, DOEgreen.jpg, OUO-frontcover.jpg, FOUO-frontcover.jpg, SSI-frontcover.jpg

Illustration files used in SamplePages.tex koala.jpg, sunset.jpg, sampfig.jpg

Disclaimer Files draftdisclaimer.jpg, LimitedDisclaimer.jpg, ssidisclaimer.jpg, defaultdisclaimer.jpg, SSI-LimitedDistribStatement.jpg

readme.txt List of files and their uses

Tips as you get started

You'll find many examples of commands in use in samplepages.tex with the resulting document samplepages.pdf. Comparing the .tex file with the resulting .pdf file is an excellent introduction to this style.

You'll also find copying the template.tex and giving it your name and working in the new file will make it easier to find information about commands that are unique to this style.

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The font files

This style uses either Arial and Times fonts.

The pnnl.cls file will expect to find the fonts in a directory one level up from the one where your .tex files are found, so please make a directory called **\fonts** and drop all the font files found in the fonts.zip package into this new directory.

Fontspec and xelatex

We are using the fontspec package which lets us easily use any .ttf or .otf font file, giving us a lot more flexibility in making an interesting design for our LaTeX documents.

However, fontspec expects the user to format the .tex file using xelatex, instead of pdflatex or other varieties of LaTeX engines. If you don't use xelatex you will get an error message, and your document will not compile, so you will be instantly reminded of this fact.

xelatex is no more difficult to use than pdflatex so this should not be a problem.

Using the Template file

The easiest way to start your article is to copy and rename the template file, **template.tex**, and use it to start your report. You'll find some examples of the commands you can enter to make the cover and titlepage, and reminders and examples about the other commands you might use.

Documentclass options

You may want to use one or more of these documentclass options. Options 3, 4, and 5 will add the security level to the bottom of each page, Option 6 will use the Limited Distribution disclaimer, but no security level, and Option 7 will change from Arial fonts to Times New Roman:

[draft] = **\documentclass[draft]{pnnl}** for draft disclaimer

[NoFigs] = **\documentclass[NoFigs]{pnnl}** to turn off illustrations.

[OUO] = Official Use Only, used **\documentclass[OUO]{pnnl}**

[FOUO] = For Official Use Only, used **\documentclass[FOUO]{pnnl}**

[SSI] = Sensitive Security Information, used **\documentclass[SSI]{pnnl}**

[Client] = Limited Distribution disclaimer, no classification level, used **\documentclass[Client]{pnnl}**

[times] = Times Roman fonts, used **\documentclass[times]{pnnl}**,
  may be used in combination with any of the other options above. With the exception of special use pages, all
  the fonts will now be Times New Roman.

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Document Set Up

After `\documentclass{pnnl}` and before `\begin{document}`:

Besides the possibility of choosing a documentclass option, described here,
there are a number of entries you must make before `\begin{document}`.

- If you use the `[OUO]`, `[FOUO]`, or `[SSI]` documentclass option, you need to supply some values to be used in the classification box on the cover page:

  OUO Please supply:
  `\OUOexemptionandcategory{}`
  `\OUOreviewingofficial{}`
  `\OUOdate{}`
  `\OUOGuidanceUsed{}`

  FOUO Please supply:
  `\FOUOexemptionandcategory{}`
  `\FOUOreviewingofficial{}`
  `\FOUOdate{}`
  `\FOUOGuidanceUsed{}`

  SSI Please supply:
  `\SSInameOrOrganization{}`
  `\SSIDate{}`
  `\SSIGuidance{}`

- The Contract number, to appear on titlepage. For example:
  `\contractnumber{DE-AC05-76RL01830}`

- Give document number to appear on top of pages, for example:
  `\PnnlDocumentNumber{12345}`

- These commands will be used on frontcover and titlepage:
  `\title{}`. For a longer title, you can break lines with `\\` ie,
  `\title{Long Title of Report\\ This Time}`

- Optional Subtitle
  `\subtitle{}`

- Publishing date
  `\pubdate{}`

- Article authors, list up to 12 authors First,Middle initial and last name, ie, `\author{AJ McDonald}`
  `\author{}`...

Frontmatter

Frontmatter starts with `\begin{document}`.

Once the set up is done, producing the cover and titlepage is trivial:
`\frontcover`
`\titlepage`

The disclaimer page will be inserted automatically, and the disclaimer text will be appropriate for the classification level of your document: public, OUO, FOUO, or SSI.

For the abstract, simply type:
`\abstract`
`<text>`

You can choose to use either the Executive Summary or Summary section:
Executive Summary
`\executivesummary`
`<text>`

or, Summary
`\summary`
`<text>`

Acronyms are easy to enter as well. In this case we use the `\begin{acrolist}...\end{acrolist}` environment with `\item{}{}` for each acronym
`\acronyms`
`\begin{acrolist}`
`\item{<acronym>}{<description>}`
`\item{PNNL}{Pacific Northwest National Laboratory}`
`\end{acrolist}`

For acknowledgments, we use
`\acknowledgments`
`<text>`

Finally, we have the contents listings:
`\tableofcontents`
`\listoffigures`
`\listoftables`
which each automatically populate with the appropriate contents.

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Sidebars

Sidebars will appear on the right side of the page, with the following text wrapping around the sidebar. They are made like this:

```
\sidebar{\title{Sidebar Headline}
Here is where to enter text.}
Text following sidebar...
```

The 'text following sidebar' can be plain text, or a section head, with or without an asterisk, or with a square bracket argument. You may want to start the sidebar at the top of a page, as you see in the `\coppersidebar` example below.

```
\sidebar{\title{Sidebar Headline}
Here is where to enter text.}
\section[Extending templates
with functions]{Extending templates\\ with functions}
Although templates provide quite a few features, often you...
```

3.0   Extending templates with functions

Although templates provide quite a few features, often you need to extend them with your own functionality. The need to add features isn't uncommon or uncalled for. For example, we've often seen the need to display a date and time in an easy-to-read format. This common request could easily be implemented as part of the template system. This is just one common example, and template systems can be extended in many cases

Sidebar Headline

Here is where to enter text.

```
\newpage
\coppersidebar{\title{Copper Sidebar Headline}
Here is where to enter text.}
\section*{Extending templates with functions}
Although templates provide quite a few features, often you need to extend them ...
```

Extending templates with functions

Although templates provide quite a few features, often you need to extend them with your own functionality. The need to add features isn't uncommon or uncalled for. For example, we've often seen the need to display a date and time in an easy-to-read format. This common request could easily be implemented as part of the template system. This is just one common example, and template systems can be extended in many cases.

Here we have some text to see how this is centered or

Copper Sidebar Headline

Here is where to enter text.

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Figures

Figures will be centered and can be a maximum of 7.5in wide.

Otherwise, there are no changes from standard LaTeX figure commands.

```
\begin{figure}[ht]
\centerline{\includegraphics[width=<dimen>]{name of illustration}}
\caption{Caption here.}
\end{figure}
```

Rotate Figure

To easily rotate the figure, we have a new environment in the pnnl documentclass:
```
\begin{rotatefigure}
...
\end{rotatefigure}
```

Within the rotate environment we can enter the illustration and caption, but do not need to surround them with `\begin{figure}...\end{figure}` since these commands are built into `rotatefigure`.

```
\begin{rotatefigure}
\centerline{\includegraphics[width=<dimen>]{<name of illustration>}}
\caption{Caption here.}
\end{rotatefigure}
```

Also, since we are rotating the figure, we have the page height to fit the illustration in, so the illustration can be wider than 7.5in.

Here is an example that uses `\textheight`, the vertical size of the non rotated page, for the width of the illustration:

```
\begin{rotatefigure}
\noindent\includegraphics[width=\textheight]{sunset.jpg}
\caption{Figure caption.}
\end{rotatefigure}
```

Please see samplepages.tex/.pdf to see this and other examples of code and results for figures and rotated figures.

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Tables | Sample of Table Code | Resulting Table | Copper Top Table

Making Tables in PNNL Style

The PNNL tables are very similar to the standard LATEX tables. Yet with a minimum of extra commands, we are able to produce the stylized and elegant PNNL table.

Here are the additional commands that are used in this style:

- **\pnnltable{...}** for correct formatting and gray bars on alternating lines.

- Within pnnltable:

  \topcopperhline, at top of table
  \midcopperhline below headers
  \bottomcopperhline at bottom of table

  \tabnote{} for raised letter, to be referred to in tablenotes.

  Used AFTER end of pnnltable, but within **\begin{table}...\end{table}**:
  \begin{tablenotes}
  \tablenote{<letter>}{<text>}
  \end{tablenotes}

Schematic for PNNL Table Making

```
\begin{table}
\caption{Caption here}

\pnnltable{

\begin{tabular}{}
%% optionally, \tabnote{} for raised letter.
%% \tabnote will be described below with \tablenote{}{}
\end{tabular}

        } %% <<== end pnnltable{}

\begin{tablenotes}
\tablenote{(a)}{text}
\tablenote{(b)}{text} etc.
\end{tablenotes}

\end{table}
```

Table Sample

```
\begin{table}[h]
\caption{Table Caption.}

%% You can change this dimension, but table must end up being a maximum
%% width of 7.5in:
\tabcolsep=6pt
\pnnltable{\begin{tabular}{lccccccccc}
\topcopperhline
&\boldmath$F$&\boldmath$\rho_b$&&\boldmath$V_w$&\boldmath$v$&\boldmath$t_o$&&
\boldmath$K_d$ \\
\multicolumn1c{\bf Experiment$^{\textbf{(b)}}$}&
\boldmath$(cm^3/hr)$&\boldmath$(g/cm^3)$&\boldmath$\omega$&\boldmath$(mL)$&
\boldmath$(cm/hr)$&\boldmath$V_w$&\boldmath$R$&\boldmath$(mL/g)$\\
\midcopperhline
Sodium orthophosphate
&
30.37& 1.478& 0.386& 20.89& 16.01& 11.22& 5.54& 1.19\\
Sodium pyrophosphate& 41.93&1.44\phantom{0}& 0.385& 20.33& 22.18& 15.90& 7.61&
1.76\\
Sodium tripolyphosphate& 40.80& 1.460& 0.392& 21.27& 21.22& 14.70&
5.17& 1.12\\
Calcium& 31.41& 1.478& 0.386& 20.89& 16.57& 11.95& \llap{1}4.14& 3.44\\
\bottomcopperhline
\end{tabular}}
\begin{tablenotes}
\tablenote{(a)}{$F$ = flow rate; $\rho_b$ = bulk density; $\omega =
$average volumetric water content (standard deviation); $V_w = $average pore
volume; $v = $average pore water velocity; $t_o = $step input; $R =
$retardation factor; $K_d = $sediment water distribution
coefficient based on $R$.}

\tablenote{(b)}{Columns appeared saturated and had reached a stable
water content. }
\end{tablenotes}
\end{table}
```

Table Code Results

Table 1. Table Caption.

Experiment[b]	F (cm^3/hr)	ρ_b (g/cm^3)	ω	V_w (mL)	v (cm/hr)	$\dfrac{t_o}{V_w}$	R	K_d (mL/g)
Sodium orthophosphate	30.37	1.478	0.386	20.89	16.01	11.22	5.54	1.19
Sodium pyrophosphate	41.93	1.44	0.385	20.33	22.18	15.90	7.61	1.76
Sodium tripolyphosphate	40.80	1.460	0.392	21.27	21.22	14.70	5.17	1.12
Calcium	31.41	1.478	0.386	20.89	16.57	11.95	14.14	3.44

(a) F = flow rate; ρ_b = bulk density; ω =average volumetric water content (standard deviation); V_w =average pore volume; v =average pore water velocity; t_o =step input; R =retardation factor; K_d =sediment water distribution coefficient based on R.

(b)   Columns appeared saturated and had reached a stable water content.

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Tables | Sample of Table Code | Resulting Table | **Copper Top Table**

Making the Copper Top Table

Making the copper top table is very similar to the previous table. We need only add the **\coppertop** command before **\begin{tabular}** and **\rowcolor{copper}** in the top two lines. Notice that if there is a **\multicolumn** entry in the first column, the **\rowcolor{copper}** should be written within the argument of the **\multicolumn**.

See the arrows pointing out the commands that should be added:

```
\begin{table}[ht]
\tabcolsep=6pt
\caption{This is a coppertop table. It is easy to make as you
can see in the documentation.}
\pnnltable{
\coppertop %% <<===
\begin{tabular}{lcccccccc}
\topcopperhline
\rowcolor{copper}  %% <<===
&\boldmath$F$&\boldmath$\rho_b$&&\boldmath$V_w$&\boldmath$v$&\boldmath$t_o$&&
\boldmath$K_d$ \\
\multicolumn1c{\rowcolor{copper} %% <<===
\bf Experiment$^{\textbf{(b)}}$}&\boldmath$(cm^3/hr)$&\boldmath$(g/cm^3)$&
\boldmath$\omega$&\boldmath$(mL)$&\boldmath$(cm/hr)$&\boldmath$V_w$&
\boldmath$R$&\boldmath$(mL/g)$\\
\midcopperhline...
```

Table 2. This is a coppertop table. It is easy to make as you can see in the documentation.

Experiment[b]	F (cm^3/hr)	ρ_b (g/cm^3)	ω	V_w (mL)	v (cm/hr)	t_o V_w	R	K_d (mL/g)
Sodium orthophosphate	30.37	1.478	0.386	20.89	16.01	11.22	5.54	1.19
Sodium pyrophosphate	41.93	1.44	0.385	20.33	22.18	15.90	7.61	1.76
Sodium tripolyphosphate	40.80	1.460	0.392	21.27	21.22	14.70	5.17	1.12
Calcium	31.41	1.478	0.386	20.89	16.57	11.95	14.14	3.44

(a) F = flow rate; ρ_b = bulk density; ω =average volumetric water content (standard deviation); V_w =average pore volume; v =average pore water velocity; t_o =step input; R =retardation factor; K_d =sediment water distribution coefficient based on R.

(b) Columns appeared saturated and had reached a stable water content.

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Appendices

To start the appendix section type **\appendix**. After this command the section head will use a letter, and so will subsection heads, equation numbers, and figure and table captions. You may also notice that the appendix pages have page numbers that include the appendix letter: A-1 will be the page number for the first appendix.
Every new section will start with another appendix letter.

```
\appendix
\section{Overview of the installation process}
The process of setting up a deep-learning workstation is fairly
involved. It consists of...
```

PNNL-12345

A Deep Learning Workstation

The process of setting up a deep-learning workstation is fairly involved. It consists of...

A.1 Appendix subsection

A.1.1 Appendix subsubsection

Figure A.1.   This little fellow likes to eat eucalyptus leaves. Thus, he and his fellow species members are found in eucalyptus forests.

Distribution Code   Distribution Results

The **\distributionpage{}** command allows you to enter distribution information, and then automatically formats it for you, saving you lots of aggravation. Use of the commands should be obvious, except that notice for the address field, use **\newline** to start a new line. And, be sure to enter the number of copies where prompted to do so.

Repeat **\recipientname** for as many names are needed. If more than one copy is to be distributed to a particular person, list number of copies in parens following the name.

Repeat the Recipient unit up to four more times for additional organizations.

```
\distributionpage{%
%% Client
\NumberofClientCopies{3}
\ClientName{Client Name}
\ClientOrg{Client Organization}
\ClientAddress{Client Address\newline     %% <<<====
City, State, Zipcode}

%% Recipient
\RecipientNumberofCopies{4}
\RecipientOrganization{Recipient Organization}
\RecipientAddress{Address\newline       %% <<<====
City, State, Zipcode}

\RecipientName{BK Recipient (3)}

%% Foreign Distribution
\TotalNumberForeignCopies{13}

\foreignNumberCopies{6}
\foreignOrganization{Foreign Organization}
\foreignName{Foreign Name}
\foreignAddress{Address\newline Address line two\newline Country}

%% Local Distribution (Other Hanford Site contractors)
\TotalNumberLocalCopies{35}
\localname{AK Kelly}{Mailstop}

%% PNNL Distribution
\PNNLname{ZB Zebra}{Mailstop}...
} %% <<== end \distributionpage{}
```

For full code, see samplepages.tex and results at samplepages.pdf

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Distribution Code | **Distribution Results**

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