Creating a PDF File from a LaTeX Thesis

Rensselaer requires that electronically-submitted theses or dissertations be in Adobe Portable Document Format. Your PDF files must have all fonts embedded, be text-searchable, and must not be encrypted. The resolution should be at least 600 dpi. You will need to submit two PDF files.

File 1: A PDF file containing the complete thesis or dissertation.

File 2: A PDF file consisting of the special "abstract title page" and the abstract. Note that the abstract title page is not the same as the title page for the thesis or dissertation. This is required for both masters and doctoral candidates.

1   Overview

Be sure to use the Rensselaer LaTeX thesis class. For information, see the Help Desk page, How to Prepare your Thesis using LaTeX. Once you have completed your thesis, it's easy to convert it to PDF. There are two widely-used methods, each producing excellent results:

1. The simpler method is to use the relatively recent program pdfLaTeX, which converts your LaTeX file directly to PDF. On Windows systems, your editor/shell (e.g., WinShell, WinEdt) has a button on the menu bar for this; on UNIX[1]/Linux systems, you can use `pdflatex` on the command line. For this method, included graphics files can be PNG (Portable Network Graphics), JPG, or PDF, but *not* EPS.

2. The traditional way is to create a PostScript file first and then convert that to PDF. To do this, you run LaTeX, then `dvips`. On Windows, you then open the .ps file with **GSView** and use menu items to convert to PDF; on UNIX[1]/Linux systems, you run the `ps2pdf` program (part of ghostscript) instead of using GSView. Be sure your ghostscript is version 8.15 or later. Included graphics files must be in EPS (Encapsulated PostScript) format.

If you want to be able to switch between using LaTeX and pdfLaTeX without changing your file, you need to keep your graphics in two formats: EPS and one of the others. Then in your .tex file, don't include the filename extension in your `\includegraphics` commands. LaTeX will assume EPS and pdfLaTeX will look for JPG, PNG or PDF files matching the name.

2   Making PDF using pdfLaTeX

If your tex/latex implementation is fairly recent (within the last two or three years), all fonts should be embedded in the PDF file by default. See section 6 for instructions on checking the fonts.

On Windows, click the appropriate button on your editor's toolbar to run **pdfLaTeX** and create your PDF file.

On unix systems, enter the command:

    pdflatex myfile   (to generate myfile.pdf from myfile.tex)

Graphics note

If you have EPS figures in your document, you will need to convert them to PDF format before running pdfLaTeX. You can do this by running the `epstopdf` program from the command line (in Windows, open a command window and `cd` to the appropriate folder):

    epstopdf myfigure.eps   (to generate myfigure.pdf)

After doing this, you will have two files for your graphic, one eps and one pdf.

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[1] Do not use UNIX on RCS to create PDF from LaTeX; the RCS versions of the programs described in this document are not recent enough.

To convert all the .eps files in the current Windows folder, use the for-command:

```
for %i in (*.eps) do epstopdf %i
```

The UNIX equivalent is:

```
for fyle in *.eps ; do epstopdf $fyle ; done     (note the spaces around the ";"s)
```

`epstopdf` should be on your system already. If not, you can download it from:
http://www.ctan.org/tex-archive/support/epstopdf/

3   Making PDF using LaTeX and dvips

If your ghostscript version is 8.15 or above and if you follow the instructions below, your PDF file should be searchable and have all fonts embedded. See section 6 for instructions on checking the fonts. (Note that if gs is earlier than 8.15, the resulting PDF file will look fine but will not be completely searchable— words containing ligatures, such as "file" or "flame," will not be found.)

On Windows:

Click the **LaTeX** button on your editor's toolbar to create the DVI file, then click the **dvips** button to create the PostScript file. If you have installed GSView and ghostscript (recommended), click on the "ghost" icon to open GSView. Go to **File -> Convert**, then select **pdfwrite**. For the Resolution, select **600 dpi**. Now click on **Properties**, and make sure the following options are set:

Compatibility Level 1.4
PDFSETTINGS /printer
EmbedAllFonts true
SubsetFonts true
MaxSubsetPct 100 (You will have to type "100" in the Value box at the top; do not select any of the other choices)

It's OK to leave the other values undefined.
Click on **OK** in the Convert window. Choose the destination file path and enter a file name with the extension `.pdf`.

On unix systems:

Enter the following commands to generate `myfile.pdf` from `myfile.tex`:

```
latex myfile    (generate myfile.dvi)
dvips -o myfile.ps myfile    (generate myfile.ps)
ps2pdf -dCompatibilityLevel=1.4 -dPDFSETTINGS=/printer -dEmbedAllFonts=true
 -dSubsetFonts=true -dMaxSubsetPct=100 myfile.ps myfile.pdf    (generate myfile.pdf)
```

Graphics note

For standard LaTeX with dvips, included graphics files must be in Encapsulated PostScript (EPS) format. However, if you have JPEG files, there's an easy way to convert. The `jpeg2ps` utility converts JPEG images to compressed PostScript Level 2 or 3 files without uncompressing the images. The JPEG data is simply "wrapped" with PostScript, which yields considerably smaller PS files. Use it from the command line (both Windows and UNIX):

```
jpeg2ps -h image.jpg > image.eps
```

You may already have jpeg2ps on your system; if not, you can download it from:
http://www.ctan.org/tex-archive/support/jpeg2ps/

4　Including hyperlinks

Both LaTeX and pdfLaTeX can use the `hyperref` package to place live links in the PDF file. By including `\usepackage{hyperref}` *as the last package* in your preamble, you will automatically get bookmarks corresponding to your sections, and hyperlinks from your tables of contents and `\cite` and `\ref` references. The package has a number of options; some of the most useful are:

colorlinks makes the text of the link colored instead of framed with a box. It's also possible to choose the color of the links with the linkcolor, urlcolor, and citecolor options.

plainpages=false distinguishes between frontmatter and mainmatter page numbers. With this option, hyperref writes different anchors for pages "ii' and "2".

pdfpagelabels sets PDF page labels so that Acrobat Reader displays the page number as (say) "ii (4 of 40)" rather than simply "4 of 40". `plainpages=false` and `pdfpagelabels` are usually used together.

breaklinks allows a line break in a long link (such as a TOC entry). *Works with pdfLaTeX only.*

linktocpage makes the page number, not the text, the link in TOC, LOF, and LOT. It's especially useful if you use LaTeX and dvips to get your PDF file, as this method cannot use `breaklinks`. If you also have long URLs in the body of the thesis, the `breakurl` package can help. For documentation, look on your system for the file **breakurl.pdf**.

The hyperref package also provides the command `\url{URL}` to link to a URL from the text, for example: `\url{http://www.ctan.org/}` or `\url{mailto:email@email.com}`. The command `\href{URL}{text}` provides a more sophisticated method, where "URL" is the address and "text" is the text displayed in the document. For example, to avoid having the text "mailto:" appear in the document, use `\href{mailto:myfriend@rpi.edu}{myfriend@rpi.edu}`.

Be sure to run LaTeX or pdfLaTeX twice to ensure correct hyperlinks.

Abbreviated example file:

```
\documentclass[chap]{thesis}
\usepackage{graphicx}         % for including graphics files
\usepackage{ifpdf}            % to use same .tex file for both latex & pdflatex
% the following specifies different options to hyperref depending on
% whether latex or pdflatex is being run.
\ifpdf
  \usepackage[colorlinks,linkcolor=blue,urlcolor=blue,citecolor=blue,
  plainpages=false,pdfpagelabels,breaklinks]{hyperref}
\else
  \usepackage[colorlinks,linkcolor=blue,urlcolor=blue,citecolor=blue,
  plainpages=false,pdfpagelabels,linktocpage]{hyperref}
\fi

\begin{document}
\include{rpititle-phd}

    ...  [other \include commands for the remaining files] ...

\end{document}
```

5 Creating the two Required PDF files

The steps below assume you are using the **thesis template files**, downloadable from the Rensselaer LATEX Thesis web page, and you have edited these files to provide your own information. If you haven't changed the names of the template files, the "root file" will be named `rpithes.tex` or, for a short thesis, `rpithes-short.tex`. The abstract titlepage file will be called either `abstitle-mas.tex` or `abstitle-phd.tex`.

File 1. The complete thesis or dissertation:
To produce a PDF file containing your complete thesis, run either pdfLATEX or LATEX (as described above in Sections 2 and 3) on the "root file", `rpithes.tex`. The root file reads all your other files, and the output will be the complete document. If your thesis is relatively short and you are using the template file `rpithes-short.tex`, run pdfLATEX or LATEX on that file.

File 2. The abstract title page and abstract:
For a Ph.D., run pdfLATEX or LATEX on the file `abstitle-phd.tex`; for a masters thesis, run pdfLATEX or LATEX on the file `abstitle-mas.tex`. In each case, the output will be the abstract title page followed by the abstract.

6 Checking the PDF file

You should check your PDF file(s) to make sure that everything has converted properly. To do so, open the PDF file in Acrobat and page through to visually make sure it looks right. To more formally check your fonts, follow these steps:

1. Go to **File -> Document Properties**. Select the **Fonts** tab.
2. In the window that opens, you should see a list of fonts.
3. Verify that all are either Type 1 or TrueType fonts.
4. You should see "Embedded Subset" for all fonts.
5. Select **OK** to close the Font window.

You can conduct a second check of fonts as follows:
1. From the **Advanced** menu, click on **Use Local Fonts** to turn this option off (the check mark should disappear).
2. Page through your PDF file to visually inspect each page as it would appear on another computer without the same fonts as yours.

Finally, print a copy of your file (as described below) and verify that everything prints as expected.

7 Printing the PDF file

To print a PDF file, go to **File -> Print...** and select the printer. In the print window that appears, there are two important steps:
1. ***Make sure that Page Scaling is set to*** **None**. This is important to ensure correct margins.
2. To mininize the possibility of printing problems, click the **Advanced** button in the lower left corner. A second dialog box will appear. In this window:
   • Be sure the "Print as Image" box is NOT checked.*
   • Make sure **PostScript Options** is selected, then:
   • In the drop-down box for "Font and Resource Policy," select **Send for each Page**.
Click **OK** to close the dialog box and click **OK** again to print the document.

If you still encounter printing problems, as a last resort you can select the "Print as Image" box. This will result in a huge file that can take a very long time to print.