The **coppe** document class

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Abstract

In this work, it is described the **coppe** document class as well as other files distributed by the CoppeTeX project. This class is suitable for writing academic dissertations, thesis and qualifying exams according to the formatting rules of the Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering. The minimalist set of macro commands allows its users to concentrate most of their efforts on text composition rather than on the document layout.

1 Introduction

Writing documents in LaTeX may be a laborious task when the authors have to prepare their manuscripts rigorously respecting formatting rules imposed by publishers. Regardless of difficulty, a lot of thesis presented to the Coordination of Graduate Studies and Research in Engineering of the Federal University of Rio de Janeiro (COPPE/UFRJ) is typeseted in LaTeX. This demand motivated the creation of the CoppeTeX project, which tries to facilitate and encourage the use of LaTeX within the COPPE/UFRJ scope.

The **coppe** document class is the main product of CoppeTeX. It was designed to be clear and succinct. It enables the creation of dissertations, qualifying exams and thesis in a simple and automatic way. The main goal of the **coppe** class is to maintain authors strictly focused on text composition without worrying about margins sizes, line spacing, paper size, vertical and horizontal alignment, etc. The CoppeTeX project comprehends also BibTeX and MakeIndex style files for creating lists of references, symbols and abbreviations. Although there aren't official guidelines to write qualifying exams, we provide this option just for convenience, as this exam is a requisite to obtain the DSc degree.

In which follows, it is described the user interface of the **coppe** class. Some details about using the style files cited above are also given. We use the term *thesis* to generally refer to dissertation, qualifying exam, and thesis itself.

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3 Support

We maintain a mailing list where users can send questions, comments, and bugs to. More details can be found at http://coppetex.sourceforge.net/mailing-list.html.

4 User interface

\frontmatter
\mainmatter
\backmatter

A thesis to be approved by the Academic Registry at COPPE/UFRJ must contain three-parts: *front*, *main* and *back* matters [1]. Each one of these parts is started by calling its corresponding macro \frontmatter, \mainmatter or \backmatter. The front matter of a thesis consists of front cover and face, cataloging page, dedication, acknowledgments, abstracts, table of contents, and lists of tables, algorithms, symbols and abbreviations. The main matter is just composed by chapters, while the back matter usually consists of bibliographic references, appendices and index.

You must invoke the \frontmatter macro immediately after the \maketitle one. The \mainmatter command comes right before the first chapter, and \backmatter must be typed before the list of references.

Front cover

This element was recently introduced by the Academic Registry. It is automatically constructed by the \maketitle command.

Front face

The front face is unnumbered. There, it is not allowed to use hyphenation [1]. It is constructed by calling \maketitle. Next, it is described the commands used to enter the information required to create it.

\author
The \author command was redefined. Here, it takes two arguments: the author's first names and surname, e.g., \author{First Names}{Surname}. The words should be typed with only first letters in uppercase.

\title
\foreigntitle
The macros \title and \foreigntitle are used to enter the titles of your monograph in the current and foreign languages. The default languages are Brazilian Portuguese and English. The babel package is automatically loaded by coppe.cls, so you do not need to load it again. The Brazilian Portuguese is the main language and the English is only required for the foreign abstract.

\advisor
\examiner
Every COPPE student is coordinated by at least one advisor. M.Sc. and D.Sc. students can have at most 2 and 3 advisors, respectively. Their names must be provided by issuing the command \advisor as below:

```
\advisor{Title}{Advisor's Name}{Surname}{Degree}
\advisor{Title}{Second Advisor's Name}{Surname}{Degree}
\advisor{Title}{Third Advisor's Name}{Surname}{Degree}
```

The advisors are not necessarily members of the thesis examination board. Thus, it is required to enter the names of all examiners using the \examiner macro. The examiners' names are entered differently:

```
\examiner{Title}{First Examiner's Name Surname}{Degree}
\examiner{Title}{Second Examiner's Name Surname}{Degree}
...
\examiner{Title}{N-th Examiner's Name Surname}{Degree}
```

Remember that all names must be given before calling \maketitle.

\department The Alberto Luiz Coimbra institute is divided into 12 academic units: Biomedical Engineering (PEB), Civil Engineering (PEC), Electrical Engineering (PEE), Mechanical Engineering (PEM), Metallurgical and Materials Science Engineering (PEMM), Nuclear Engineering (PEN), Ocean Engineering (PENO), Energy Planning (PPE), Production Engineering (PEP), Chemical Engineering (PEQ), Systems Engineering and Computer Science (PESC), and Transportation Engineering (PET). You must specify your department using one of the above abbreviations, e.g., \department{PEC}.

\date This macro is used to set the month and year of defense. This information is required to create the front face, cataloging details page and abstracts. For example, October 2007 should be entered as \date{10}{2007}.

\keyword The keywords should describe the concentration areas of your work. You must provide them as follows:

```
\keyword{First Keyword}
\keyword{Second Keyword}
...
\keyword{N-th Keyword}
```

Usually, six words are enough.

Cataloging details

This page contains cataloging information useful for librarians. Fortunately, it is automatically generated from the data you entered at the time you call \maketitle. It is not needed in qualifying exams, though.

Dedication (optional)

\dedication This macro was added for convenience. The input text is placed at the right bottom of a blank page. It is emphasized and in normal size.

Abstracts

abstract
foreignabstract As stated by the Academic Registry [1], abstracts must be in one page each. Still, it is recommended that they should be only one paragraph long. They must be defined inside the environments abstract and foreignabstract.

Lists of symbols and abbreviations (optional)

\abbrev The lists of symbols and abbreviations are optional, although highly recommended.
\symbl It is a good practice to define a symbol/abbreviation in its first occurrence in the text. To define a symbol use \symbl{Symbol}{Symbol Definition}, and for abbreviations \abbrev{Abbreviation}{Abbreviation Definition}. These

```

commands are called *dummy*, since they don't output anything at the place they are executed, just an entry in the correspondent list.

\makeloabbreviations
\makelosymbols
\printloabbreviations
\printlosymbols

These lists are lexicographically sorted by using the MakeIndex program, which is part of any LaTeX implementation. MakeIndex needs two commands to create a final sorted list: one which generates a list of entries and the other that indicates the position where the list will be printed out. To generate the lists of symbols and abbreviations, the `coppe` class provides the commands `\makeloabbreviations` and `\makelosymbols`, respectively. They must be called in the document preamble. The commands `\printlosymbols` and `\printloabbreviations` have to be invoked at the point where you want these lists appear, e.g., following the list of tables as showed in the example. Once you call `latex`, it will be created two files with extensions `abx` and `syx`, which contain MakeIndex input data. They must be processed with `makeindex` in order to get the lists correctly produced, redirecting the output to files with extension `lab` and `los` respectively:

```
makeindex -s coppe.ist -o example.lab example.abx
makeindex -s coppe.ist -o example.los example.syx
```

Note the `-s` option for specifying the style `coppe.ist`. Now, rerun `latex` twice to get the references solved and you are done.

### References

It is well known that bibliography databases can be easily maintained with the aid of BibTeX. Thus, the CoppeTeX project designed two BibTeX styles, `coppe-plain.bst` and `coppe-unsrt.bst`. The `coppe-plain.bst` creates a list of references alphabetically sorted. The later is a numbered style, which sorts references by the order of citation. To use them, you have to select either `coppe-plain` or `coppe-unsrt` as the BibTeX style and include your BibTeX references without the `bib` extension, as in the following example:

```
\bibliographystyle{coppe-unsrt}
\bibliography{example}
```

Run in sequence LaTeX, BibTeX, and twice again LaTeX to resolve reference. These styles are `natbib` compatible. This means that you can freely issue the commands `\citet` and `\citep`, as well as any other `natbib` feature.

5   Class options

There are some options users can specify in order to customize the appearance of the output produced by the `coppe` class. These options can be passed to `coppe` as follows: `\documentclass[option1, option2]{coppe}`. In which follows, we give a brief description of all supported options.

dsc, msc, dscexam The `coppe` class is able to produce thesis, dissertations, and qualifying exams, which are enabled by the `dsc`, `msc`, and `dscexam` options, respectively.

pdftex, dvips Since the addition of a front cover with Minerva's picture, it is required to use a package to enable graphics inclusion. This requires the specification of a graphical driver for handling image files. You may choose between two standard graphical drivers, `pdftex` and `dvips`, just passing its name as a class option. Because the PDF is the leading format for publishing digital documents, CoppeTeX loads the `pdftex` driver by default.

doublespacing The default line spacing is one-and-a-half. For enabling double spacing between lines, use the `doublespacing` option.

numbers The default citation style is the author-year scheme, which must be followed by the use of its corresponding BibTeX style, namely, the `coppe-plain.bst` file. For numbered citations, specify the option `numbers` to the `coppe` class. In this case, it is mandatory the use of `coppe-unsrt.bst`, as the bibliography style.

6 Quick, useful tips

Pictures. The default picture format of LaTeX is the Encapsulated PostScript (EPS). If you use pdfTeX, the default format becomes the PDF, but you can equally load PNG files. For such, you must enter the name of your image file without extension, e.g., `\includegraphics{filename}`, and `pdftex` will firstly look for a file called `filename.pdf` and after for file `filename.png`.

Fonts. The default font in LaTeX is the Computer Modern. If you would like to try its enhanced version, consider using the `lmodern` package. To use Times, it is recommended to load the package `mathptmx`, rather than the deprecated `times`. There is also an enhanced Times version available with the `tgtermes` package. You can still use the Arial font face with the package `uarial`. Before including these packages you should call `\usepackage[T1]{fontenc}`. This command will tell LaTeX to use high-quality PostScript Type1 fonts.

Hyperref. When working with PDF's, there is the possibility to add extra information to the file as the author's name, document title, subject, keywords, etc. This is easily done with the `hyperref` package. It is also useful to enable hyperlinks. Fortunately, the `coppe` class loads `hyperref` by default and fills in all the document properties for you.

Printing. To get your work correctly printed, you must ensure that any page scaling option (e.g., fit or shrink to printable area) isn't enabled. This kind of option often comes in print dialogs of document visualization softwares.

7 A simple example

```
1 ⟨∗example⟩
2 \documentclass[dsc,pdftex,numbers]{coppe}
3 \usepackage[T1]{fontenc}
4 \usepackage[latin1]{inputenc}
5 \usepackage{amsmath,amssymb}
```

```latex
 6 \usepackage{lmodern}
 7
 8 \makelosymbols
 9 \makeloabbreviations
10
11 \begin{document}
12   \title{Título da Tese}
13   \foreigntitle{Thesis Title}
14 \author{Nome do Autor}{Sobrenome}
15 \advisor{Prof.}{Nome do Primeiro Orientador}{Sobrenome}{D.Sc.}
16 \advisor{Prof.}{Nome do Segundo Orientador}{Sobrenome}{Ph.D.}
17 \advisor{Prof.}{Nome do Terceiro Orientador}{Sobrenome}{D.Sc.}
18
19 \examiner{Prof.}{Nome do Primeiro Examinador Sobrenome}{D.Sc.}
20 \examiner{Prof.}{Nome do Segundo Examinador Sobrenome}{Ph.D.}
21 \examiner{Prof.}{Nome do Terceiro Examinador Sobrenome}{D.Sc.}
22 \examiner{Prof.}{Nome do Quarto Examinador Sobrenome}{Ph.D.}
23 \examiner{Prof.}{Nome do Quinto Examinador Sobrenome}{Ph.D.}
24 \department{PEC}
25 \date{10}{2009}
26
27 \keyword{Primeira palavra-chave}
28 \keyword{Segunda palavra-chave}
29 \keyword{Terceira palavra-chave}
30
31 \maketitle
32
33 \frontmatter
34 \dedication{A alguém cujo valor é digno desta dedicatória.}
35
36 \chapter*{Agradecimentos}
37
38 Gostaria de agradecer a todos.
39
40 \begin{abstract}
41
42 Apresenta-se, nesta tese, ...
43
44 \end{abstract}
45
46 \begin{foreignabstract}
47
48 In this work, we present ...
49
50 \end{foreignabstract}
51
52 \tableofcontents
53 \listoffigures
54 \listoftables
55 \printlosymbols
56 \printloabbreviations
57
58 \mainmatter
59 \chapter{Introdução}
```

```latex
60
61  Segundo a norma de formatação de teses e dissertações do Instituto Alberto
62  Luiz Coimbra de Pós-graduação e Pesquisa de Engenharia (COPPE), toda
63  abreviatura deve ser definida antes de utilizada.\abbrev{COPPE}{Instituto
64  Alberto Luiz Coimbra de Pós-graduação e Pesquisa de Engenharia}
65
66  Do mesmo modo, é imprescindível definir os símbolos, tal como o conjunto dos
67  números reais $\mathbb{R}$ e o conjunto vazio $\emptyset$.
68  \symbl{$\mathbb{R}$}{Conjunto dos números reais} \symbl{$\emptyset$}{Conjunto
69  vazio}
70
71  \chapter{Revisão Bibliográfica}
72
73  Para ilustrar a completa adesão ao estilo de citações e listagem de
74  referências bibliográficas, a Tabela~\ref{tab:citation} apresenta citações
75  de alguns dos trabalhos contidos na norma fornecida pela CPGP da COPPE,
76  utilizando o estilo numérico.
77
78  \begin{table}[h]
79  \caption{Exemplos de citações utilizando o comando padrão
80    \texttt{\textbackslash cite} do \LaTeX\ e
81    o comando \texttt{\textbackslash citet},
82    definidos pelo pacote \texttt{natbib}.}
83  \label{tab:citation}
84  \centering
85  {\footnotesize
86  \begin{tabular}{|c|c|c|}
87    \hline
88    Tipo da Publicação & \verb|\cite| & \verb|\citet|\\
89    \hline
90    Livro & \cite{book-example} & \citet{book-example}\\
91    Artigo & \cite{article-example} & \citet{article-example}\\
92    Relatório & \cite{techreport-example} & \citet{techreport-example}\\
93    Relatório & \cite{techreport-exampleIn} & \citet{techreport-exampleIn}\\
94    Anais de Congresso & \cite{inproceedings-example} &
95      \citet{inproceedings-example}\\
96    Séries & \cite{incollection-example} & \citet{incollection-example}\\
97    Em Livro & \cite{inbook-example} & \citet{inbook-example}\\
98    Dissertação de mestrado & \cite{mastersthesis-example} &
99      \citet{mastersthesis-example}\\
100   Tese de doutorado & \cite{phdthesis-example} & \citet{phdthesis-example}\\
101    \hline
102  \end{tabular}}
103  \end{table}
104
105  \chapter{Método Proposto}
106  \chapter{Resultados e Discussões}
107  \chapter{Conclusões}
108
109  \backmatter
110  \bibliographystyle{coppe-unsrt}
111  \bibliography{example}
112
113  \appendix
```

```
114  \chapter{Algumas Demonstrações}
115 \end{document}
116 ⟨/example⟩
```

8 Implementation

8.1 The 'coppe.cls' file

```
117 ⟨*class⟩
118 \def\filename{coppe.dtx}
119 \def\fileversion{v2.1}
120 \def\filedate{2009/11/17}
121 \NeedsTeXFormat{LaTeX2e}[1995/12/01]
122 \ProvidesClass{coppe}[\filedate\ \fileversion\ COPPE Dissertations and Thesis]
123 \LoadClass[12pt,a4paper,oneside]{book}
124 \RequirePackage[sort&compress]{natbib}
125 \RequirePackage{hyphenat}
126 \RequirePackage{lastpage}
127 \RequirePackage{hyperref}
128 \RequirePackage[english,brazil]{babel}
129 \RequirePackage{ifthen}
130 \RequirePackage{graphicx}
131 \RequirePackage{setspace}
132 \RequirePackage{tabularx}
133 \RequirePackage{eqparbox}
134 \RequirePackage[a4paper,bindingoffset=0.0cm,vcentering=true,%
135 top=2.5cm,bottom=2.5cm,left=3.0cm,right=3.0cm]{geometry}
136 \def\CoppeTeX{{\rm C\kern-.05em{\sc o\kern-.025em p\kern-.025em
137 p\kern-.025em e}}\kern-.08em
138 T\kern-.1667em\lower.5ex\hbox{E}\kern-.125emX\spacefactor1000}
139 \newboolean{isdraft}
140 \newboolean{maledoc}
141 \setboolean{maledoc}{false}
142 \setboolean{isdraft}{false}
143 %
144 \DeclareOption{msc}{%
145   \newcommand{\@degree}{M.Sc.}
146   \newcommand{\@degreename}{Mestrado}
147   \newcommand{\local@degname}{Mestre}
148   \newcommand{\foreign@degname}{Master}
149   \newcommand\local@doctype{Disserta\c c}{\~ a}o}
150   \newcommand\foreign@doctype{Dissertation}
151 }
152 \DeclareOption{dscexam}{%
153   \newcommand{\@degree}{D.Sc.}
154   \newcommand{\@degreename}{Doutorado}
155   \newcommand{\local@degname}{Doutor}
156   \newcommand{\foreign@degname}{Doctor}
157   \setboolean{maledoc}{true}
158   \newcommand\local@doctype{Exame de Qualifica\c c}{\~ a}o}
159   \newcommand\foreign@doctype{Qualifying Exam}
160 }
161 \DeclareOption{dsc}{%
162   \newcommand{\@degree}{D.Sc.}
```

```
163  \newcommand{\@degreename}{Doutorado}
164  \newcommand{\local@degname}{Doutor}
165  \newcommand{\foreign@degname}{Doctor}
166  \newcommand\local@doctype{Tese}
167  \newcommand\foreign@doctype{Thesis}
168 }
169 \DeclareOption{draft}{%
170  \setboolean{isdraft}{true}
171  \ClassWarning{coppe}{draft mode is ON}%
172 }
173 \DeclareOption{numbers}{%
174  \PassOptionsToPackage{numbers}{natbib}
175 }
176 \DeclareOption{pdftex}{%
177  \PassOptionsToPackage{pdftex}{hyperref,graphicx}
178  \PassOptionsToPackage{plainpages=false,pdfpagelabels}{hyperref}
179 }
180 \DeclareOption{dvips}{%
181  \PassOptionsToPackage{dvips}{hyperref,graphicx}
182 }
```

Here is the default one-and-a-half line spacing. Users can change to double spacing by passing the `doublespacing` option.

```
183 \onehalfspacing
184 \DeclareOption{doublespacing}{%
185  \doublespacing
186 }
187 \ProcessOptions\relax
```

\university   Set the university name.

```
188 \newcommand\university[1]{%
189  \renewcommand\local@universityname{#1}
190 }
191 %
192 % \begin{macro}{\department}
193 % This macro is used to set the author's affiliation. There are twelve options
194 % which correspond to all academic units at COPPE/UFRJ. It defines the current
195 % and the foreign names of these units.
196 %     \begin{macrocode}
197 \newcommand\department[1]{%
198  \ifthenelse{\equal{#1}{PEB}}
199    {\global\def\local@deptname{Engenharia Biom{\' e}dica}
200     \global\def\foreign@deptname{Biomedical Engineering}}{}
201  \ifthenelse{\equal{#1}{PEC}}
202    {\global\def\local@deptname{Engenharia Civil}
203     \global\def\foreign@deptname{Civil Engineering}}{}
204  \ifthenelse{\equal{#1}{PEE}}
205    {\global\def\local@deptname{Engenharia El{\' e}trica}
206     \global\def\foreign@deptname{Electrical Engineering}}{}
207  \ifthenelse{\equal{#1}{PEM}}
208    {\global\def\local@deptname{Engenharia Mec{\^ a}nica}
209     \global\def\foreign@deptname{Mechanical Engineering}}{}
210  \ifthenelse{\equal{#1}{PEMM}}
211    {\global\def\local@deptname{Engenharia Metal{\' u}rgica e de Materiais}
212 \global\def\foreign@deptname{Metallurgical and Materials Engineering}}{}
```

```
213  \ifthenelse{\equal{#1}{PEN}}
214    {\global\def\local@deptname{Engenharia Nuclear}
215     \global\def\foreign@deptname{Nuclear Engineering}}{}
216  \ifthenelse{\equal{#1}{PENO}}
217    {\global\def\local@deptname{Engenharia Oce{\^ a}nica}
218     \global\def\foreign@deptname{Ocean Engineering}}{}
219  \ifthenelse{\equal{#1}{PPE}}
220    {\global\def\local@deptname{Planejamento Energ{\' e}tico}
221     \global\def\foreign@deptname{Energy Planning}}{}
222  \ifthenelse{\equal{#1}{PEP}}
223    {\global\def\local@deptname{Engenharia de Produ{\c c}{\~ a}o}
224     \global\def\foreign@deptname{Production Engineering}}{}
225  \ifthenelse{\equal{#1}{PEQ}}
226    {\global\def\local@deptname{Engenharia Qu{\' i}mica}
227     \global\def\foreign@deptname{Chemical Engineering}}{}
228  \ifthenelse{\equal{#1}{PESC}}
229    {\global\def\local@deptname{Engenharia de Sistemas e Computa{\c c}{\~ a}o}
230     \global\def\foreign@deptname{Systems Engineering and Computer Science}}{}
231  \ifthenelse{\equal{#1}{PET}}
232    {\global\def\local@deptname{Engenharia de Transportes}
233     \global\def\foreign@deptname{Transportation Engineering}}{}
234 }
```

`\title`   Used to enter the foreign title.

```
235 \renewcommand\title[1]{%
236   \global\def\local@title{#1}%
237 }
```

`\foreigntitle`   Used to enter the foreign title.

```
238 \newcommand\foreigntitle[1]{%
239   \global\def\foreign@title{#1}%
240 }
```

`\advisor`   Defines globally the title, name and academic degree of the advisor.

```
241 \newcount\@advisor\@advisor0
242 \newcommand\advisor[4]{%
243   \global\@namedef{CoppeAdvisorTitle:\expandafter\the\@advisor}{#1}
244   \global\@namedef{CoppeAdvisorName:\expandafter\the\@advisor}{#2}
245   \global\@namedef{CoppeAdvisorSurname:\expandafter\the\@advisor}{#3}
246   \global\@namedef{CoppeAdvisorDegree:\expandafter\the\@advisor}{#4}
247   \global\advance\@advisor by 1
248   \ifnum\@advisor>1
249     \renewcommand\local@advisorstring{Orientadores}
250     \renewcommand\foreign@advisorstring{Advisors}
251   \fi
252 }
```

`\examiner`

```
253 \newcount\@examiner\@examiner0
254 \newcommand\examiner[3]{%
255   \global\@namedef{CoppeExaminer:\expandafter\the\@examiner}{#1\ #2, #3}
256   \global\advance\@examiner by 1
257 }
```

\author   It was redefined to allow the identification of the author's first names and surname.

```
258 \renewcommand\author[2]{%
259   \global\def\@authname{#1}
260   \global\def\@authsurn{#2}
261 }
```

\date   This code enables makes easy to switch from dates in different languages.

```
262 \renewcommand\date[2]{%
263   \month=#1
264   \year=#2
265 }
```

\local@monthname

```
266 \newcommand\local@monthname{\ifcase\month\or
267   Janeiro\or Fevereiro\or Mar{\c c}o\or Abril\or Maio\or Junho\or
268   Julho\or Agosto\or Setembro\or Outubro\or Novembro\or Dezembro\fi}
```

\foreign@monthname

```
269 \newcommand\foreign@monthname{\ifcase\month\or
270   January\or February\or March\or April\or May\or June\or
271   July\or August\or September\or October\or November\or December\fi}
```

\place   Used to enter the place of defense.

```
272 \newcommand\place[3]{%
273   \renewcommand\local@cityname{#1}
274   \renewcommand\local@statename{#2}
275   \renewcommand\local@countryname{#3}
276 }
```

\keyword

```
277 \newcounter{keywords}
278 \newcommand\keyword[1]{%
279   \global\@namedef{CoppeKeyword:\expandafter\the\c@keywords}{#1}
280   \global\addtocounter{keywords}{1}
281 }
```

\frontmatter   The number of pages for both frontmatter and mainmatter printed in the cata-
loging details page is computed by means of simple LaTeX labels.

```
282 \renewcommand\frontmatter{%
283   \cleardoublepage
284   \@mainmatterfalse
285   \pagenumbering{roman}
286   \thispagestyle{empty}
287   \setcounter{page}{2}
288   \makefrontpage
289   \clearpage
290   \pagestyle{plain}
291   \ifthenelse{\boolean{maledoc}}{}{\makecatalog}%
292 }
```

\mainmatter

```
293 \renewcommand\mainmatter{%
294   \immediate\write\@auxout{%
```

```
295    \string\newlabel{front:pageno}{{}{\Roman{page}}{}{page.\roman{page}}{}}}
296  \cleardoublepage
297  \@mainmattertrue
298  \pagestyle{plain}
299  \pagenumbering{arabic}}
```

\backmatter

```
300 \renewcommand\backmatter{%
301  \if@openright
302    \cleardoublepage
303  \else
304    \clearpage
305  \fi}
306 %
```

\maketitle

```
307 \renewcommand\maketitle{%
308 \pagenumbering{alph}
309 \config@hypersetup
310  \begin{titlepage}
311  \begin{flushleft}
312  \setlength\baselineskip{0pt}
313  \setlength\parskip{1mm}
314  \makebox[20mm][c]{\includegraphics{minerva}}\par
315  \makebox[20mm][c]{\bf\sf\small COPPE/UFRJ}
316  \end{flushleft}
317  \begin{center}
318  \nohyphens{\MakeUppercase\local@title}\par
319  \vspace*{28mm}
320  \nohyphens{\@authname\ \@authsurn}\par
321  \end{center}
322  \vspace*{16mm}
323  \begin{flushright}
324  \begin{minipage}{80mm}
325  \frontcover@maintext
326  \end{minipage}\par
327  \vspace*{7.5mm}
328  \nohyphens{%
329  \begin{tabularx}{80mm}[b]{@{}l@{ }X@{}}
330    \local@advisorstring: &
331    \count1=0
332    \toks@={}
333    \@whilenum \count1<\@advisor \do{%
334    \ifcase\count1 % same as \ifnum0=\count1
335      \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
336        \expandafter\endcsname\expandafter\space%
337        \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
338    \else
339      \toks@=\expandafter\expandafter\expandafter{%
340        \expandafter\the\expandafter\toks@%
341        \expandafter&\expandafter\space%
342        \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
343        \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\
344      }%
```

```
345      \fi
346      \advance\count1 by 1}
347      \the\toks@
348   \end{tabularx}}\par
349   \end{flushright}
350   \vspace*{\fill}
351   \begin{center}
352   \local@cityname\par
353   \local@monthname\ de \number\year
354   \end{center}
355   \end{titlepage}
356   \global\let\maketitle\relax%
357   \global\let\and\relax}

358 \newcommand\makefrontpage{%
359   \begin{center}
360     \sloppy\nohyphens{\MakeUppercase\local@title}\par
361     \vspace*{7mm}
362     {\@authname\ \@authsurn}\par
363   \end{center}\par
364   \vspace*{4mm}
365   \frontpage@maintext
366   \vspace*{8mm}
367   \noindent\local@approvedname:\par
368      \begin{center}
369   \begin{flushright}
370         \count1=0
371         \@whilenum \count1<\@examiner \do {
372            \vskip26\p@ \baselineskip12pt
373         \eqparbox{signture@list}{\hrulefill}\\
374         \eqparbox{signture@list}{\protect\centering%
375            \ \ \ \csname CoppeExaminer:\the\count1 \endcsname\ \ \ }\\
376            \advance\count1 by 1}
377   \end{flushright}
378      \end{center}
379   \vspace*{\fill}
380   \frontpage@bottomtext}
381 \newcommand\config@hypersetup{%
382 \begingroup
383 % changes to \toks@ and \count@ are kept local;
384 % it's not necessary for them, but it is usually the case
385 % for \count1, because the first ten counters are written
386 % to the DVI file, thus you got lucky because of PDF output
387 \toks@={}% in this special case not necessary
388 \count@=0 %
389 \@whilenum\count@<\value{keywords}\do{%
390   % * a keyword separator is not necessary,
391   %     if there is just one keyword
392   % * \csname CoppeKeyword:\the\count@\endcsname must be expanded
393   %     at least once, to get rid of the loop depended \count@
394   \ifcase\count@ % same as \ifnum0=\count@
395     \toks@=\expandafter{\csname CoppeKeyword:\the\count@\endcsname}%
396   \else
397     \toks@=\expandafter\expandafter\expandafter{%
```

```
398        \expandafter\the\expandafter\toks@
399        \expandafter;\expandafter\space
400        \csname CoppeKeyword:\the\count@\endcsname
401      }%
402    \fi
403    \advance\count@ by 1 %
404  }%
405  \edef\x{\endgroup
406    \noexpand\hypersetup{%
407      pdfkeywords={\the\toks@}%
408    }%
409  }%
410 \x
411 \hypersetup{%
412   pdfauthor={\@authname\ \@authsurn},
413   pdftitle={\local@title},
414 pdfsubject={\local@doctype\ de \@degreename\ em \local@deptname\ da COPPE/UFRJ},
415   pdfcreator={LaTeX with CoppeTeX toolkit},
416   breaklinks={true},
417   raiselinks={true},
418   pageanchor={true},
419 }}
```

\makecatalog   When the document has illustrations, it is required to insert ": il.;´´ between the number of pages of the textual part and the page dimension. We have created a label to flag the existence of lists of figures. It is checked to be undefined using the plain TEX command \@isundefined [7].

```
420 \newcommand\makecatalog{%
421   \vspace*{\fill}
422   \begin{center}
423     \setlength{\fboxsep}{5mm}
424     \framebox[120mm][c]{\makebox[5mm][c]{}%
425       \begin{minipage}[c]{105mm}
426       \setlength{\parindent}{5mm}
427       \noindent\sloppy\nohyphens\@authsurn,
428       \nohyphens\@authname\par
429       \nohyphens{\local@title/\@authname\ \@authsurn. -- \local@cityname:
430       UFRJ/COPPE, \number\year.}\par
431       \pageref{front:pageno},
432       \pageref{LastPage}
433       p.\@ifundefined{r@cat:lofflag}{}{\pageref{cat:lofflag}} $29,7$cm.\par
434       % There is an issue here. When the last entry must be split between lines,
435       % the spacing between it and the next paragraph becomes smaller.
436       % Should we manually introduce a fixed space? But how could we know that
437       % a name was split? Is this happening yet?
438       \nohyphens{%
439       \begin{tabularx}{100mm}[b]{@{}l@{ }X@{}}
440         \local@advisorstring: &
441         \count1=0
442         \toks@={}
443         \@whilenum \count1<\@advisor \do{%
444         \ifcase\count1 % same as \ifnum0=\count1
445           \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
446           \expandafter\endcsname\expandafter\space%
```

```
447        \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
448      \else
449        \toks@=\expandafter\expandafter\expandafter{%
450          \expandafter\the\expandafter\toks@
451          \expandafter&\expandafter\space
452          \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
453          \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\
454        }%
455      \fi
456      \advance\count1 by 1}
457      \the\toks@
458    \end{tabularx}}\par
459    \nohyphens{\local@doctype\ ({\MakeLowercase\@degreename}) --
460    UFRJ/COPPE/Programa de \local@deptname, \number\year.}\par
461    \bibname: p. \pageref{bib:begin} -- \pageref{bib:end}.\par
462    \count1=0
463    \count2=1
464    \nohyphens{\@whilenum \count1<\value{keywords} \do {%
465      \number\count2. \csname CoppeKeyword:\the\count1 \endcsname.
466      \advance\count1 by 1
467      \advance\count2 by 1}
468    I. \csname CoppeAdvisorSurname:0\endcsname,%
469    \ \csname CoppeAdvisorName:0\endcsname%
470    \ifthenelse{\equal{\@advisor}{1}}{}{\emph{~et~al.}}.
471    II. \local@universityname, COPPE, Programa de \local@deptname.
472    III. T{\' i}tulo.}
473    \end{minipage}}
474  \end{center}
475  \vspace*{\fill}}
```

\dedication

```
476 \newcommand\dedication[1]{
477   \gdef\@dedic{#1}
478     \cleardoublepage
479     \vspace*{\fill}
480     \begin{flushright}
481       \begin{minipage}{60mm}
482         \raggedleft \it \normalsize \@dedic
483       \end{minipage}
484     \end{flushright}}
```

abstract This is a specialization of the abstract in the article standard class.

```
485 \newenvironment{abstract}{%
486   \clearpage
487   \thispagestyle{plain}
488   \abstract@toptext\par
489   \vspace*{8.6mm}
490   \begin{center}
491     \sloppy\nohyphens{\MakeUppercase\local@title}\par
492     \vspace*{13.2mm}
493     \@authname\ \@authsurn \par
494     \vspace*{7mm}
495     \local@monthname/\number\year
496   \end{center}\par
```

```
497 % Old style
498 %  \vspace*{3mm}
499  \vspace*{\fill}
500  \noindent%
501  \begin{tabularx}{\textwidth}[b]{@{}l@{ }X@{}}
502    \local@advisorstring: &
503    \count1=0
504    \toks@={}
505    \@whilenum \count1<\@advisor \do{%
506    \ifcase\count1 % same as \ifnum0=\count1
507      \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
508      \expandafter\endcsname\expandafter\space%
509      \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
510    \else
511      \toks@=\expandafter\expandafter\expandafter{%
512        \expandafter\the\expandafter\toks@
513        \expandafter&\expandafter\space
514        \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
515        \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\
516      }%
517    \fi
518    \advance\count1 by 1}
519    \the\toks@
520  \end{tabularx}\par
521  \vspace*{2mm}
522  \noindent\local@deptstring: \local@deptname\par
523  \vspace*{7mm}}{\vspace*{\fill}}
```

foreignabstract

```
524 \newenvironment{foreignabstract}{%
525  \clearpage
526  \thispagestyle{plain}
527  \begin{otherlanguage}{english}
528  \foreignabstract@toptext\par
529  \vspace*{8.6mm}
530  \begin{center}
531    \sloppy\nohyphens{\MakeUppercase\foreign@title}\par
532    \vspace*{13.2mm}
533    \@authname\ \@authsurn \par
534    \vspace*{7mm}
535    \foreign@monthname/\number\year
536  \end{center}\par
537 % Old style
538 %  \vspace*{3mm}
539  \vspace*{\fill}
540  \noindent%
541  \begin{tabularx}{\textwidth}[b]{@{}l@{ }X@{}}
542    \foreign@advisorstring: &
543    \count1=0
544    \toks@={}
545    \@whilenum \count1<\@advisor \do{%
546    \ifcase\count1 % same as \ifnum0=\count1
547      \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
548      \expandafter\endcsname\expandafter\space%
```

16

```
549        \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
550      \else
551        \toks@=\expandafter\expandafter\expandafter{%
552          \expandafter\the\expandafter\toks@
553          \expandafter&\expandafter\space
554          \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
555          \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\
556        }%
557      \fi
558      \advance\count1 by 1}
559      \the\toks@
560    \end{tabularx}\par
561    \vspace*{2mm}
562    \noindent\foreign@deptstring: \foreign@deptname\par
563    \vspace*{7mm}}{%
564    \end{otherlanguage}
565    \vspace*{\fill}
566    \global\let\@author\@empty
567    \global\let\@date\@empty
568    \global\let\foreign@title\@empty
569    \global\let\foreign@title\relax
570    \global\let\local@title\@empty
571    \global\let\local@title\relax
572    \global\let\author\relax
573    \global\let\author\relax
574    \global\let\date\relax}
```

`\listoffigures`

```
575 \renewcommand\listoffigures{%
576    \immediate\write\@auxout{%
577    \string\newlabel{cat:lofflag}{{}{:~il.;}{}{page.\roman{page}}{}}}
578      \if@twocolumn
579        \@restonecoltrue\onecolumn
580      \else
581        \@restonecolfalse
582      \fi
583    \chapter*{\listfigurename}%
584      \addcontentsline{toc}{chapter}{\listfigurename}%
585      \@mkboth{\MakeUppercase\listfigurename}%
586            {\MakeUppercase\listfigurename}%
587    \@starttoc{lof}%
588    \if@restonecol\twocolumn\fi
589      }
```

`\listoftables`

```
590 \renewcommand\listoftables{%
591      \if@twocolumn
592        \@restonecoltrue\onecolumn
593      \else
594        \@restonecolfalse
595      \fi
596    \chapter*{\listtablename}%
597      \addcontentsline{toc}{chapter}{\listtablename}%
598      \@mkboth{%
```

```
599          \MakeUppercase\listtablename}%
600            {\MakeUppercase\listtablename}%
601       \@starttoc{lot}%
602       \if@restonecol\twocolumn\fi
603         }
```

\printlosymbols

```
604 \newcommand\printlosymbols{%
605 \renewcommand\glossaryname{\listsymbolname}%
606 \@input@{\jobname.los}}
```

\makelosymbols

```
607 \def\makelosymbols{%
608   \newwrite\@losfile
609   \immediate\openout\@losfile=\jobname.syx
610   \def\symbl{\@bsphack\begingroup
611               \@sanitize
612               \@wrlos}\typeout
613   {Writing index of symbols file \jobname.syx}%
614   \let\makelosymbols\@empty
615 }
616 \@onlypreamble\makelosymbols
```

```
617 \AtBeginDocument{%
618 \@ifpackageloaded{hyperref}{%
619   \def\@wrlos#1#2{%
620     \protected@write\@losfile{}%
621       {\string\indexentry{[#1] #2|hyperpage}{\thepage}}%
622     \endgroup
623     \@esphack}}{%
624   \def\@wrlos#1#2{%
625     \protected@write\@losfile{}%
626       {\string\indexentry{[#1] #2}{\thepage}}%
627     \endgroup
628     \@esphack}}}
```

\printloabbreviations

```
629 \newcommand\printloabbreviations{%
630 \renewcommand\glossaryname{\listabbreviationname}%
631 \@input@{\jobname.lab}}
```

\makeloabbreviations

```
632 \def\makeloabbreviations{%
633   \newwrite\@labfile
634   \immediate\openout\@labfile=\jobname.abx
635   \def\abbrev{\@bsphack\begingroup
636               \@sanitize
637               \@wrlab}\typeout
638   {Writing index of abbreviations file \jobname.abx}%
639   \let\makeloabbreviations\@empty
640 }
641 \@onlypreamble\makeloabbreviations
```

```latex
642 \AtBeginDocument{%
643 \@ifpackageloaded{hyperref}{%
644   \def\@wrlab#1#2{%
645     \protected@write\@labfile{}%
646       {\string\indexentry{[#1] #2|hyperpage}{\thepage}}%
647     \endgroup
648     \@esphack}}{%
649   \def\@wrlab#1#2{%
650     \protected@write\@labfile{}%
651       {\string\indexentry{[#1] #2}{\arabic{page}}}%
652     \endgroup
653     \@esphack}}}

654 \newdimen\bibindent%
655 \setlength\bibindent{1.5em}%
656 \renewenvironment{thebibliography}[1]%
657      {\chapter*{\bibname}%
658       \addcontentsline{toc}{chapter}{\bibname}%
659       \immediate\write\@auxout{%
660       \string\newlabel{bib:begin}{{}{\arabic{page}}{}{page.\arabic{page}}{}}}%
661       \list{\@biblabel{\@arabic\c@enumiv}}%
662           {\setlength{\labelwidth}{0ex}%
663            \setlength{\leftmargin}{9.0ex}%
664            \setlength{\itemindent}{-9.0ex}%
665            \advance\leftmargin\labelsep%
666            \@openbib@code%
667            \usecounter{enumiv}%
668            \let\p@enumiv\@empty%
669            \renewcommand\theenumiv{\@arabic\c@enumiv}}%
670       \sloppy%
671       \clubpenalty4000%
672       \@clubpenalty \clubpenalty%
673       \widowpenalty4000%
674       \sfcode`\.\@m}%
675      {\def\@noitemerr%
676        {\@latex@warning{Empty `thebibliography' environment}}%
677       \immediate\write\@auxout{%
678       \string\newlabel{bib:end}{{}{\arabic{page}}{}{page.\arabic{page}}{}}}%
679       \endlist}

680 \newenvironment{theglossary}{%
681   \if@twocolumn%
682     \@restonecoltrue\onecolumn%
683   \else%
684     \@restonecolfalse%
685   \fi%
686   \@mkboth{\MakeUppercase\glossaryname}%
687   {\MakeUppercase\glossaryname}%
688   \chapter*{\glossaryname}%
689   \addcontentsline{toc}{chapter}{\glossaryname}
690   \list{}
691   {\setlength{\listparindent}{0in}%
692    \setlength{\labelwidth}{1.0in}%
693    \setlength{\leftmargin}{1.5in}%
694    \setlength{\labelsep}{0.5in}%
```

```latex
695    \setlength{\itemindent}{0in}}%
696    \sloppy}%
697   {\if@restonecol\twocolumn\fi%
698 \endlist}
699 %
700 \renewenvironment{theindex}{%
701   \if@twocolumn
702     \@restonecolfalse
703   \else
704     \@restonecoltrue
705   \fi
706   \twocolumn[\@makeschapterhead{\indexname}]%
707   \@mkboth{\MakeUppercase\indexname}%
708   {\MakeUppercase\indexname}%
709   \thispagestyle{plain}\parindent\z@
710   \addcontentsline{toc}{chapter}{\indexname}
711   \parskip\z@ \@plus .3\p@\relax
712   \columnseprule \z@
713   \columnsep 35\p@
714   \let\item\@idxitem}
715   {\if@restonecol\onecolumn\else\clearpage\fi}
716 \newcommand\glossaryname{Glossary}
717 \newcommand\listabbreviationname{Lista de Abreviaturas}
718 \newcommand\listsymbolname{Lista de S{\' i}mbolos}
719 %
720 \newcommand\local@advisorstring{Orientador}
721 \newcommand\foreign@advisorstring{Advisor}
722 \ifthenelse{\boolean{maledoc}}{%
723   \newcommand\local@approvedname{Examinado por}%
724 }{%
725   \newcommand\local@approvedname{Examinada por}%
726 }
727 \newcommand\local@universityname{Universidade Federal do Rio de Janeiro}
728 \newcommand\local@deptstring{Programa}
729 \newcommand\foreign@deptstring{Department}
730 \newcommand\local@cityname{Rio de Janeiro}
731 \newcommand\local@statename{RJ}
732 \newcommand\local@countryname{Brasil}
733 %
734 \newcommand\frontcover@maintext{
735   \sloppy\nohyphens{\local@doctype\ de \@degreename\
736   \ifthenelse{\boolean{maledoc}}{apresentado}{apresentada}
737   ao Programa de P{\' o}s-gradua{\c c}{\~ a}o em \local@deptname,
738   COPPE, da \local@universityname, como parte dos requisitos
739   necess{\' a}rios {\' a} obten{\c c}{\~ a}o do t{\' i}tulo de
740   \local@degname\ em \local@deptname.}
741 }
742 %
743 \newcommand\frontpage@maintext{
744   \noindent {\MakeUppercase\local@doctype}
745   \ifthenelse{\boolean{maledoc}}{SUBMETIDO}{SUBMETIDA}
746   \sloppy\nohyphens{AO CORPO DOCENTE DO INSTITUTO ALBERTO LUIZ COIMBRA
747   DE P{\' O}S-GRADUA{\c C}{\~ A}O E PESQUISA DE ENGENHARIA (COPPE) DA
748   UNIVERSIDADE FEDERAL DO RIO DE JANEIRO COMO PARTE DOS REQUISITOS
```

```
749    NECESS{\' A}RIOS PARA A OBTEN{\c C}{\~ A}O DO GRAU DE
750    {\MakeUppercase\local@degname} EM CI{\^E}NCIAS EM
751    {\MakeUppercase\local@deptname.\par}}%
752  }
753  %
754  \newcommand\frontpage@bottomtext{%
755    \begin{center}
756    {\MakeUppercase{\local@cityname, \local@statename\ -- \local@countryname}}\par
757    {\MakeUppercase\local@monthname\ DE \number\year}
758    \end{center}%
759  }
760  %
761  \newcommand\abstract@toptext{%
762    \noindent Resumo \ifthenelse{\boolean{maledoc}}{do}{da}
763    \local@doctype\ \ifthenelse{\boolean{maledoc}}{apresentado}{apresentada}
764    \sloppy\nohyphens{{\` a} COPPE/UFRJ como parte dos requisitos
765    necess{\' a}rios para a obten{\c c}{\~ a}o do grau de
766    \local@degname\ em Ci{\^ e}ncias (\@degree)}
767  }
768  \newcommand\foreignabstract@toptext{%
769    \noindent \sloppy\nohyphens{Abstract of \foreign@doctype\ presented to
770    COPPE/UFRJ as a partial fulfillment of the requirements for the
771    degree of \foreign@degname\ of Science (\@degree)}
772  }
773  %
774  ⟨/class⟩

775  ⟨∗glossary⟩
776  actual '='
777  quote '!'
778  level '>'
779  delim_0    ", p. "
780  lethead_flag  0
781  headings_flag 0
782  preamble
783  "\n\\begin{theglossary}\n  \\makeatletter"
784  postamble
785  "\n  \\end{theglossary}\n"
786  ⟨/glossary⟩
```

Acknowledgments

References

[1] CPGP/COPPE/UFRJ. *Norma para a Elaboração Gráfica de Teses.* Rio de Janeiro, RJ, Brasil, Julho de 2008.

[2] Donald E. Knuth. *The TEXbook*. Addison-Wesley, Reading, MA, USA, 1984.

[3] Leslie Lamport. *LATEX: A Document Preparation System*. Addison-Wesley, Reading, MA, USA, 1986.

[4] Oren Patashnik. Bibtexing. Documentation for general BibTEX users, February 1988.

[5] Oren Patashnik. Designing bibtex styles. The part of BibTeX 's documentation that's not meant for general users, February 1988.

[6] William Strunk, Jr. and E. B. White. *The Elements of Style*. Macmillan, 3 edition, 1979.

[7] TEX Frequently Asked Questions.
http://www.tex.ac.uk/cgi-bin/texfaq2html?introduction=yes.

Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

Change History

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