

# 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 COPPE<sub>TEX</sub> 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 L<sup>A</sup>T<sub>E</sub>X 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 typeset in L<sup>A</sup>T<sub>E</sub>X. This demand motivated the creation of the COPPE<sub>TEX</sub> project, which tries to facilitate and encourage the use of L<sup>A</sup>T<sub>E</sub>X within the COPPE/UFRJ scope.

The `coppe` document class is the main product of COPPE<sub>TEX</sub>. 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 COPPE<sub>TEX</sub> project comprehends also BIB<sub>TEX</sub> 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.

## 2 License

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To see the full text of the GNU GPL license, go to the `COPYING` file attached to this package.

### 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/mailling-list.html>.

### 4 User interface

`\frontmatter` 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` 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.

`\foreigntitle`

`\advisor` 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:

`\examiner`

```
\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** As stated by the Academic Registry [1], abstracts must be in one page each, with  
**foreignabstract** at most 250 words. We 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.  
**\syml** It is a good practice to define a symbol/abbreviation in its first occurrence in the text. To define a symbol use `\syml{Symbol}{Symbol Definition}`, and for abbreviations `\abbrev{Abbreviation}{Abbreviation Definition}`. These

```

\makeloabbreviations
\makelosymbols
\printloabbreviations
\printlosymbols

```

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

These lists are lexicographically sorted by using the MakeIndex program, which is part of any L<sup>A</sup>T<sub>E</sub>X 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 B<sup>I</sup>B<sup>T</sup><sub>E</sub>X. Thus, the COPPE<sub>T</sub><sub>E</sub>X project designed two B<sup>I</sup>B<sup>T</sup><sub>E</sub>X 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 B<sup>I</sup>B<sup>T</sup><sub>E</sub>X style and include your B<sup>I</sup>B<sup>T</sup><sub>E</sub>X references without the `bib` extension, as in the following example:

```

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

```

Run in sequence L<sup>A</sup>T<sub>E</sub>X, B<sup>I</sup>B<sup>T</sup><sub>E</sub>X, and twice again L<sup>A</sup>T<sub>E</sub>X 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.

**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 B<sub>I</sub>T<sub>E</sub>X 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 L<sup>A</sup>T<sub>E</sub>X is the Encapsulated PostScript (EPS). If you use pdfL<sup>A</sup>T<sub>E</sub>X, 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 pdf<sub>l</sub>atex will firstly look for a file called `filename.pdf` and after for file `filename.png`. For producing high quality pictures with embedded fonts we recommend the Ipe drawing software at <http://ipe7.sourceforge.net/>.

**Fonts.** The default font in L<sup>A</sup>T<sub>E</sub>X 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`.

**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 will do this automatically if `hyperref` is loaded.

**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,numbers]{coppe}
3 \usepackage{amsmath,amssymb}
4 \usepackage{hyperref}
5
6 \makelosymbols
7 \makeloabbreviations
8
9 \begin{document}
10 \title{T\'itulo da Tese}
11 \foreigntitle{Thesis Title}
12 \author{Nome do Autor}{Sobrenome}
13 \advisor{Prof.}{Nome do Primeiro Orientador}{Sobrenome}{D.Sc.}
14 \advisor{Prof.}{Nome do Segundo Orientador}{Sobrenome}{Ph.D.}
15 \advisor{Prof.}{Nome do Terceiro Orientador}{Sobrenome}{D.Sc.}

```

```

16
17 \examiner{Prof.}{Nome do Primeiro Examinador Sobrenome}{D.Sc.}
18 \examiner{Prof.}{Nome do Segundo Examinador Sobrenome}{Ph.D.}
19 \examiner{Prof.}{Nome do Terceiro Examinador Sobrenome}{D.Sc.}
20 \examiner{Prof.}{Nome do Quarto Examinador Sobrenome}{Ph.D.}
21 \examiner{Prof.}{Nome do Quinto Examinador Sobrenome}{Ph.D.}
22 \department{PEC}
23 \date{02}{2011}
24
25 \keyword{Primeira palavra-chave}
26 \keyword{Segunda palavra-chave}
27 \keyword{Terceira palavra-chave}
28
29 \maketitle
30
31 \frontmatter
32 \dedication{A algu\'em cujo valor \'e digno desta dedicat\'oria.}
33
34 \chapter*{Agradecimentos}
35
36 Gostaria de agradecer a todos.
37
38 \begin{abstract}
39
40 Apresenta-se, nesta tese, ...
41
42 \end{abstract}
43
44 \begin{foreignabstract}
45
46 In this work, we present ...
47
48 \end{foreignabstract}
49
50 \tableofcontents
51 \listoffigures
52 \listoftables
53 \printlosymbols
54 \printloabbreviations
55
56 \mainmatter
57 \chapter{Introdu{\c c}\~ao}
58
59 Segundo a norma de formata{\c c}\~ao de teses e disserta{\c c}\~oes do
60 Instituto Alberto Luiz Coimbra de P\'os-gradua{\c c}\~ao e Pesquisa de
61 Engenharia (COPPE), toda abreviatura deve ser definida antes de
62 utilizada.\abbrev{COPPE}{Instituto Alberto Luiz Coimbra de P\'os-gradua{\c
63 c}\~ao e Pesquisa de Engenharia}
64
65 Do mesmo modo, \'e imprescind\'ivel definir os s\'imbolos, tal como o
66 conjunto dos n\'umeros reais  $\mathbb{R}$  e o conjunto vazio  $\emptyset$ .
67 \syml{\mathbb{R}}{Conjunto dos n\'umeros reais}
68 \syml{\emptyset}{Conjunto vazio}
69

```

```

70 \chapter{Revis\~ao Bibliogr\'afica}
71
72 Para ilustrar a completa ades\~ao ao estilo de cita{\c c}\~oes e listagem de
73 refer\~encias bibliogr\'aficas, a Tabela~\ref{tab:citation} apresenta cita{\c
74 c}\~oes de alguns dos trabalhos contidos na norma fornecida pela CPGP da
75 COPPE, utilizando o estilo num\'erico.
76
77 \begin{table}[h]
78 \caption{Exemplos de cita{\c c}\~oes utilizando o comando padr\~ao
79 \texttt{\textbackslash cite} do \LaTeX\ e
80 o comando \texttt{\textbackslash citet},
81 fornecido pelo pacote \texttt{natbib}.}
82 \label{tab:citation}
83 \centering
84 {\footnotesize
85 \begin{tabular}{|c|c|c|}
86 \hline
87 Tipo da Publica{\c c}\~ao & \verb|\cite| & \verb|\citet|\\
88 \hline
89 Livro & \cite{book-example} & \citet{book-example}\\
90 Artigo & \cite{article-example} & \citet{article-example}\\
91 Relat\'orio & \cite{techreport-example} & \citet{techreport-example}\\
92 Relat\'orio & \cite{techreport-exampleIn} & \citet{techreport-exampleIn}\\
93 Anais de Congresso & \cite{inproceedings-example} &
94 \citet{inproceedings-example}\\
95 S\'eries & \cite{incollection-example} & \citet{incollection-example}\\
96 Em Livro & \cite{inbook-example} & \citet{inbook-example}\\
97 Disserta{\c c}\~ao de mestrado & \cite{mastersthesis-example} &
98 \citet{mastersthesis-example}\\
99 Tese de doutorado & \cite{phdthesis-example} & \citet{phdthesis-example}\\
100 \hline
101 \end{tabular}}
102 \end{table}
103
104 \chapter{M\'etodo Proposto}
105 \chapter{Resultados e Discuss\~oes}
106 \chapter{Conclus\~oes}
107
108 \backmatter
109 \bibliographystyle{coppe-unsrc}
110 \bibliography{example}
111
112 \appendix
113 \chapter{Algumas Demonstra{\c c}\~oes}
114 \end{document}
115 \</example>

```

## 8 Implementation

### 8.1 The ‘coppe.cls’ file

```

116 \*class
117 \def\filename{coppe.dtx}
118 \def\fileversion{v2.2}

```

```

119 \def\filedate{2011/02/08}
120 \NeedsTeXFormat{LaTeX2e}[1995/12/01]
121 \ProvidesClass{coppe}[\filedate\ \fileversion\ COPPE Dissertations and Thesis]
122 \LoadClass[12pt,a4paper,oneside]{book}
123 \RequirePackage[sort&compress]{natbib}
124 \RequirePackage{hyphenat}
125 \RequirePackage{lastpage}
126 \RequirePackage[english,brazil]{babel}
127 \RequirePackage{ifthen}
128 \RequirePackage{graphicx}
129 \RequirePackage{setspace}
130 \RequirePackage{tabularx}
131 \RequirePackage{eqparbox}
132 \RequirePackage{ltxcmds}
133 \RequirePackage[a4paper,bindingoffset=0.0cm,vcentering=true,%
134 top=2.5cm,bottom=2.5cm,left=3.0cm,right=3.0cm]{geometry}
135 \def\CoppeTeX{{\rm C\kern-.05em{\sc o\kern-.025em p\kern-.025em
136 p\kern-.025em e}}\kern-.08em
137 T\kern-.1667em\lower.5ex\hbox{E}\kern-.125emX\spacefactor1000}

138 \newboolean{maledoc}
139 \setboolean{maledoc}{false}
140 %
141 % Definiton of class options.
142 \DeclareOption{msc}{%
143   \newcommand{\@degree}{M.Sc.}
144   \newcommand{\@degree name}{Mestrado}
145   \newcommand{\local@degname}{Mestre}
146   \newcommand{\foreign@degname}{Master}
147   \newcommand\local@doctype{Disserta{\c c}{\~ a}o}
148   \newcommand\foreign@doctype{Dissertation}
149 }
150 \DeclareOption{dsceexam}{%
151   \newcommand{\@degree}{D.Sc.}
152   \newcommand{\@degree name}{Doutorado}
153   \newcommand{\local@degname}{Doutor}
154   \newcommand{\foreign@degname}{Doctor}
155   \setboolean{maledoc}{true}
156   \newcommand\local@doctype{Exame de Qualifica{\c c}{\~ a}o}
157   \newcommand\foreign@doctype{Qualifying Exam}
158 }
159 \DeclareOption{dsc}{%
160   \newcommand{\@degree}{D.Sc.}
161   \newcommand{\@degree name}{Doutorado}
162   \newcommand{\local@degname}{Doutor}
163   \newcommand{\foreign@degname}{Doctor}
164   \newcommand\local@doctype{Tese}
165   \newcommand\foreign@doctype{Thesis}
166 }
167 \DeclareOption{numbers}{%
168   \PassOptionsToPackage{numbers}{natbib}
169 }

```

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



```

170 \onehalfspacing
171 \DeclareOption{doublespacing}{%
172   \doublespacing
173 }
174 \ProcessOptions\relax

\department This macro is used to set the author's affiliation. There are twelve options which
correspond to all academic units at COPPE/UFRJ. It defines the current and the
foreign names of these units.

175 \newcommand\department[1]{%
176   \ifthenelse{equal{#1}{PEB}}
177     {\global\def\local@deptname{Engenharia Biom{\` e}dica}
178     \global\def\foreign@deptname{Biomedical Engineering}}{}
179   \ifthenelse{equal{#1}{PEC}}
180     {\global\def\local@deptname{Engenharia Civil}
181     \global\def\foreign@deptname{Civil Engineering}}{}
182   \ifthenelse{equal{#1}{PEE}}
183     {\global\def\local@deptname{Engenharia El{\` e}trica}
184     \global\def\foreign@deptname{Electrical Engineering}}{}
185   \ifthenelse{equal{#1}{PEM}}
186     {\global\def\local@deptname{Engenharia Mec{\` a}nica}
187     \global\def\foreign@deptname{Mechanical Engineering}}{}
188   \ifthenelse{equal{#1}{PEMM}}
189     {\global\def\local@deptname{Engenharia Metal{\` u}rgica e de Materiais}
190 \global\def\foreign@deptname{Metallurgical and Materials Engineering}}{}
191   \ifthenelse{equal{#1}{PEN}}
192     {\global\def\local@deptname{Engenharia Nuclear}
193     \global\def\foreign@deptname{Nuclear Engineering}}{}
194   \ifthenelse{equal{#1}{PEN0}}
195     {\global\def\local@deptname{Engenharia Oce{\` a}nica}
196     \global\def\foreign@deptname{Ocean Engineering}}{}
197   \ifthenelse{equal{#1}{PPE}}
198     {\global\def\local@deptname{Planejamento Energ{\` e}tico}
199     \global\def\foreign@deptname{Energy Planning}}{}
200   \ifthenelse{equal{#1}{PEP}}
201     {\global\def\local@deptname{Engenharia de Produ{\c c}{\` a}o}
202     \global\def\foreign@deptname{Production Engineering}}{}
203   \ifthenelse{equal{#1}{PEQ}}
204     {\global\def\local@deptname{Engenharia Qu{\` i}mica}
205     \global\def\foreign@deptname{Chemical Engineering}}{}
206   \ifthenelse{equal{#1}{PESC}}
207     {\global\def\local@deptname{Engenharia de Sistemas e Computa{\c c}{\` a}o}
208     \global\def\foreign@deptname{Systems Engineering and Computer Science}}{}
209   \ifthenelse{equal{#1}{PET}}
210     {\global\def\local@deptname{Engenharia de Transportes}
211     \global\def\foreign@deptname{Transportation Engineering}}{}
212 }

\title Used to enter the title in Brazilian Portuguese.

213 \renewcommand\title[1]{%
214   \global\def\local@title{#1}%
215 }

\foreigntitle Used to enter the foreign title.

```

```

216 \newcommand\foreigntitle[1]{%
217   \global\def\foreign@title{#1}%
218 }

```

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

```

219 \newcount\@advisor\@advisor0
220 \newcommand\advisor[4]{%
221   \global\@namedef{CoppeAdvisorTitle:\expandafter\the\@advisor}{#1}
222   \global\@namedef{CoppeAdvisorName:\expandafter\the\@advisor}{#2}
223   \global\@namedef{CoppeAdvisorSurname:\expandafter\the\@advisor}{#3}
224   \global\@namedef{CoppeAdvisorDegree:\expandafter\the\@advisor}{#4}
225   \global\advance\@advisor by 1
226   \ifnum\@advisor>1
227     \renewcommand\local@advisorstring{Orientadores}
228     \renewcommand\foreign@advisorstring{Advisors}
229   \fi
230 }

```

**\examiner**

```

231 \newcount\@examiner\@examiner0
232 \newcommand\examiner[3]{%
233   \global\@namedef{CoppeExaminer:\expandafter\the\@examiner}{#1\ #2, #3}
234   \global\advance\@examiner by 1
235 }

```

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

```

236 \renewcommand\author[2]{%
237   \global\def\@authname{#1}
238   \global\def\@authsurn{#2}
239 }

```

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

```

240 \renewcommand\date[2]{%
241   \month=#1
242   \year=#2
243 }

```

**\local@monthname**

```

244 \newcommand\local@monthname{\ifcase\month\or
245   Janeiro\or Fevereiro\or Mar{c c}\o\or Abril\or Maio\or Junho\or
246   Julho\or Agosto\or Setembro\or Outubro\or Novembro\or Dezembro\fi}

```

**\foreign@monthname**

```

247 \newcommand\foreign@monthname{\ifcase\month\or
248   January\or February\or March\or April\or May\or June\or
249   July\or August\or September\or October\or November\or December\fi}

```

**\keyword**

```

250 \newcounter{keywords}
251 \newcommand\keyword[1]{%
252   \global\@namedef{CoppeKeyword:\expandafter\the\c@keywords}{#1}
253   \global\addtocounter{keywords}{1}
254 }

```

`\frontmatter` The number of pages for both frontmatter and mainmatter printed in the cataloging details page is computed by means of simple L<sup>A</sup>T<sub>E</sub>X labels.

```
255 \renewcommand\frontmatter{%
256   \cleardoublepage
257   \@mainmatterfalse
258   \pagenumbering{roman}
259   \thispagestyle{empty}
260   \setcounter{page}{2}
261   \makefrontpage
262   \clearpage
263   \pagestyle{plain}
264   \ifthenelse{\boolean{maledoc}}{\}\{\makecatalog}%
265 }
```

`\mainmatter`

```
266 \renewcommand\mainmatter{%
267   \coppe@mainBegin
268   \cleardoublepage
269   \@mainmattertrue
270   \pagestyle{plain}
271   \pagenumbering{arabic}}
```

`\backmatter`

```
272 \renewcommand\backmatter{%
273   \if@openright
274     \cleardoublepage
275   \else
276     \clearpage
277   \fi}
278 %
```

`\maketitle`

```
279 \renewcommand\maketitle{%
280   \pagenumbering{alph}
281   \ltx@ifpackageloaded{hyperref}{\coppe@hypersetup}{}%
282   \begin{titlepage}
283   \begin{flushleft}
284     \vspace*{1.5mm}
285     \setlength\baselineskip{0pt}
286     \setlength\parskip{1mm}
287     \makebox[20mm][c]{\hspace{4.8cm}\includegraphics{coppe-logo}}
288   \end{flushleft}
289   \vspace{1.05cm}
290   \begin{center}
291     \nohyphens{\MakeUppercase\local@title}\par
292     \vspace*{3cm}
293     \nohyphens{\@authname\ \@authsurn}\par
294   \end{center}
295   \vspace*{2.1cm}
296   \begin{flushright}
297     \begin{minipage}{8.45cm}
298       \frontcover@maintext
299     \end{minipage}\par
```

```

300 \vspace*{7.5mm}
301 \nohyphens{%
302 \begin{tabularx}{8.45cm}[b]{@{}l@{ }}>{\raggedright\arraybackslash}X@{}}
303 \local@advisorstring: &
304 \count1=0
305 \toks@={}
306 \@whilenum \count1<\@advisor \do{%
307 \ifcase\count1 % same as \ifnum0=\count1
308 \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
309 \expandafter\endcsname\expandafter\space%
310 \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
311 \else
312 \toks@=\expandafter\expandafter\expandafter{%
313 \expandafter\the\expandafter\toks@%
314 \expandafter&\expandafter\space%
315 \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
316 \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\}
317 }%
318 \fi
319 \advance\count1 by 1}
320 \the\toks@
321 \end{tabularx}}\par
322 \end{flushright}
323 \vspace*{\fill}
324 \begin{center}
325 \local@cityname\par
326 \local@monthname\ de \number\year
327 \end{center}
328 \end{titlepage}
329 \global\let\maketitle\relax%
330 \global\let\and\relax}

331 \newcommand\makefrontpage{%
332 \begin{center}
333 \sloppy\nohyphens{\MakeUppercase\local@title}\par
334 \vspace*{7mm}
335 {\@authname\ \@authsur}\par
336 \end{center}\par
337 \vspace*{4mm}
338 \frontpage@maintext
339 \vspace*{8mm}
340 \noindent\local@approvedname:\par
341 \begin{center}
342 \begin{flushright}
343 \count1=0
344 \@whilenum \count1<\@examiner \do {
345 \vskip26\p@ \baselineskip12pt
346 \eqparbox{signature@list}{\hrulefill}\\
347 \eqparbox{signature@list}{\protect\centering%
348 \ \ \ \csname CoppeExaminer:\the\count1 \endcsname\ \ \ \}\\
349 \advance\count1 by 1}
350 \end{flushright}
351 \end{center}
352 \vspace*{\fill}

```

```

353 \frontpage@bottomtext}
354 \newcommand\coppe@hypersetup{%
355 \begin{group}
356 % changes to \toks@ and \count@ are kept local;
357 % it's not necessary for them, but it is usually the case
358 % for \count1, because the first ten counters are written
359 % to the DVI file, thus you got lucky because of PDF output
360 \toks@={}% in this special case not necessary
361 \count@=0 %
362 \@whilenum\count@<\value{keywords}\do{%
363 % * a keyword separator is not necessary,
364 % if there is just one keyword
365 % * \csname CoppeKeyword:\the\count@\endcsname must be expanded
366 % at least once, to get rid of the loop depended \count@
367 \ifcase\count@ % same as \ifnum0=\count@
368 \toks@=\expandafter{\csname CoppeKeyword:\the\count@\endcsname}%
369 \else
370 \toks@=\expandafter\expandafter\expandafter{%
371 \expandafter\the\expandafter\toks@
372 \expandafter;\expandafter\space
373 \csname CoppeKeyword:\the\count@\endcsname
374 }%
375 \fi
376 \advance\count@ by 1 %
377 }%
378 \edef\x{\endgroup
379 \noexpand\hypersetup{%
380 pdfkeywords={\the\toks@}%
381 }%
382 }%
383 \x
384 \hypersetup{%
385 pdfauthor={\@authname\ \@authsur},
386 pdftitle={\local@title},
387 pdfsubject={\local@doctype\ de \@degreename\ em \local@deptname\ da COPPE/UFRJ},
388 pdfcreator={LaTeX with CoppeTeX toolkit},
389 breaklinks={true},
390 raiselinks={true},
391 pageanchor={true},
392 }}

```

`\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 T<sub>E</sub>X command `\isundefined` [7].

```

393 \newcommand\makecatalog{%
394 \vspace*{\fill}
395 \begin{center}
396 \setlength{\fboxsep}{5mm}
397 \framebox[120mm][c]{\makebox[5mm][c]{}}
398 \begin{minipage}[c]{105mm}
399 \setlength{\parindent}{5mm}
400 \noindent\sloppy\nohyphens\@authsur,

```

```

401 \nohyphens\@authname\par
402 \nohyphens{\local@title/\@authname\ \@authsurn. -- \local@cityname:
403 UFRJ/COPPE, \number\year.}\par
404 \pageref{front:pageno},
405 \pageref{LastPage}
406 p.\@ifundefined{r@cat:lofflag}{\pageref{cat:lofflag}} $29,7$cm.\par
407 % There is an issue here. When the last entry must be split between lines,
408 % the spacing between it and the next paragraph becomes smaller.
409 % Should we manually introduce a fixed space? But how could we know that
410 % a name was split? Is this happening yet?
411 \nohyphens{%
412 \begin{tabularx}{100mm}[b]{@{}l@{ }>{\raggedright\arraybackslash}X@{}}
413 \local@advisorstring: &
414 \count1=0
415 \toks@={}
416 \@whilenum \count1<\@advisor \do{%
417 \ifcase\count1 % same as \ifnum0=\count1
418 \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
419 \expandafter\endcsname\expandafter\space%
420 \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
421 \else
422 \toks@=\expandafter\expandafter\expandafter{%
423 \expandafter\the\expandafter\toks@
424 \expandafter&\expandafter\space
425 \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
426 \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\}
427 }%
428 \fi
429 \advance\count1 by 1}
430 \the\toks@
431 \end{tabularx}}\par
432 \nohyphens{\local@doctype\ ({\MakeLowercase\@degreename}) --
433 UFRJ/COPPE/Programa de \local@deptname, \number\year.}\par
434 \bibname: p. \pageref{bib:begin} -- \pageref{bib:end}.\par
435 \count1=0
436 \count2=1
437 \nohyphens{\@whilenum \count1<\value{keywords} \do {%
438 \number\count2. \csname CoppeKeyword:\the\count1 \endcsname.
439 \advance\count1 by 1
440 \advance\count2 by 1}
441 I. \csname CoppeAdvisorSurname:0\endcsname,%
442 \ \csname CoppeAdvisorName:0\endcsname%
443 \ifthenelse{\@advisor>1}{\ \emph{et~al.}}{}}.
444 II. \local@universityname, COPPE, Programa de \local@deptname.
445 III. T{\ i}itulo.}
446 \end{minipage}}
447 \end{center}
448 \vspace*{\fill}}

```

\dedication

```

449 \newcommand\dedication[1]{
450 \gdef\@dedic{#1}
451 \cleardoublepage
452 \vspace*{\fill}}

```

```

453 \begin{flushright}
454 \begin{minipage}{60mm}
455 \raggedleft \it \normalsize \@dedic
456 \end{minipage}
457 \end{flushright}}

```

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

```

458 \newenvironment{abstract}{%
459 \clearpage
460 \thispagestyle{plain}
461 \abstract@toptext\par
462 \vspace*{8.6mm}
463 \begin{center}
464 \sloppy\nohyphens{\MakeUppercase\local@title}\par
465 \vspace*{13.2mm}
466 \@authname\ \@authsurn \par
467 \vspace*{7mm}
468 \local@monthname/\number\year
469 \end{center}\par
470 \vspace*{\fill}
471 \noindent%
472 \begin{tabularx}{\textwidth}[b]{@{}l@{ }>{\raggedright\arraybackslash}X@{}}
473 \local@advisorstring: &
474 \count1=0
475 \toks@={}
476 \@whilenum \count1<\@advisor \do{%
477 \ifcase\count1 % same as \ifnum0=\count1
478 \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
479 \expandafter\endcsname\expandafter\space%
480 \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
481 \else
482 \toks@=\expandafter\expandafter\expandafter{%
483 \expandafter\the\expandafter\toks@
484 \expandafter&\expandafter\space
485 \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
486 \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\}
487 }%
488 \fi
489 \advance\count1 by 1}
490 \the\toks@
491 \end{tabularx}\par
492 \vspace*{2mm}
493 \noindent\local@deptstring: \local@deptname\par
494 \vspace*{7mm}}{\vspace*{\fill}}

```

**foreignabstract**

```

495 \newenvironment{foreignabstract}{%
496 \clearpage
497 \thispagestyle{plain}
498 \begin{otherlanguage}{english}
499 \foreignabstract@toptext\par
500 \vspace*{8.6mm}
501 \begin{center}
502 \sloppy\nohyphens{\MakeUppercase\foreign@title}\par

```

```

503 \vspace*{13.2mm}
504 \@authname\ \@authsurn \par
505 \vspace*{7mm}
506 \foreign@monthname/\number\year
507 \end{center}\par
508 \vspace*{\fill}
509 \noindent%
510 \begin{tabularx}{\textwidth}[b]{@{}l@{ }>{\raggedright\arraybackslash}X@{}}
511 \foreign@advisorstring: &
512 \count1=0
513 \toks@={}
514 \@whilenum \count1<\@advisor \do{%
515 \ifcase\count1 % same as \ifnum0=\count1
516 \toks@=\expandafter{\csname CoppeAdvisorName:\the\count1%
517 \expandafter\endcsname\expandafter\space%
518 \csname CoppeAdvisorSurname:\the\count1\endcsname\\}
519 \else
520 \toks@=\expandafter\expandafter\expandafter{%
521 \expandafter\the\expandafter\toks@
522 \expandafter&\expandafter\space
523 \csname CoppeAdvisorName:\the\count1\expandafter\endcsname%
524 \expandafter\space\csname CoppeAdvisorSurname:\the\count1\endcsname\\}
525 }%
526 \fi
527 \advance\count1 by 1}
528 \the\toks@
529 \end{tabularx}\par
530 \vspace*{2mm}
531 \noindent\foreign@deptstring: \foreign@deptname\par
532 \vspace*{7mm}}{%
533 \end{otherlanguage}
534 \vspace*{\fill}
535 \global\let\@author\@empty
536 \global\let\@date\@empty
537 \global\let\foreign@title\@empty
538 \global\let\foreign@title\relax
539 \global\let\local@title\@empty
540 \global\let\local@title\relax
541 \global\let\author\relax
542 \global\let\author\relax
543 \global\let\date\relax}

```

\listoffigures

```

544 \renewcommand\listoffigures{%
545 \coppe@hasLof
546 \if@twocolumn
547 \@restonecoltrue\onecolumn
548 \else
549 \@restonecolfalse
550 \fi
551 \chapter*{\listfigurename}%
552 \addcontentsline{toc}{chapter}{\listfigurename}%
553 \mkboth{\MakeUppercase\listfigurename}%
554 {\MakeUppercase\listfigurename}%

```



```

555 \starttoc{lof}%
556 \if@restonecol\twocolumn\fi
557 }

```

#### \listoftables

```

558 \renewcommand\listoftables{%
559 \if@twocolumn
560 \@restonecoltrue\onecolumn
561 \else
562 \@restonecolfalse
563 \fi
564 \chapter*{\listtablename}%
565 \addcontentsline{toc}{chapter}{\listtablename}%
566 \mkboth{%
567 \MakeUppercase\listtablename}%
568 {\MakeUppercase\listtablename}%
569 \starttoc{lot}%
570 \if@restonecol\twocolumn\fi
571 }

```

#### \printlosymbols

```

572 \newcommand\printlosymbols{%
573 \renewcommand\glossaryname{\listsymbolname}%
574 \@input@{\jobname.los}}

```

#### \makelosymbols

```

575 \def\makelosymbols{%
576 \newwrite\@losfile
577 \immediate\openout\@losfile=\jobname.syx
578 \def\syml{\@bsphack\begin{group}
579 \@sanitize
580 \@wrlos\typeout
581 {Writing index of symbols file \jobname.syx}%
582 \let\makelosymbols\@empty
583 }
584 \@onlypreamble\makelosymbols

585 \AtBeginDocument{%
586 \ifpackageloaded{hyperref}{%
587 \def\@wrlos#1#2{%
588 \protected@write\@losfile{%
589 {\string\indexentry{[#1] #2|hyperpage}{\thepage}}%
590 \endgroup
591 \@esphack}}}%
592 \def\@wrlos#1#2{%
593 \protected@write\@losfile{%
594 {\string\indexentry{[#1] #2}{\thepage}}%
595 \endgroup
596 \@esphack}}}

```

#### \printloabbreviations

```

597 \newcommand\printloabbreviations{%
598 \renewcommand\glossaryname{\listabbreviationname}%
599 \@input@{\jobname.lab}}

```

\makeloabbreviations

```

600 \def\makeloabbreviations{%
601   \newwrite\@labfile
602   \immediate\openout\@labfile=\jobname.abx
603   \def\abbrev{\@bsphack\begin{group}
604     \@sanitize
605     \@wrlab\typeout
606     {Writing index of abbreviations file \jobname.abx}%
607     \let\makeloabbreviations\@empty
608   }
609   \@onlypreamble\makeloabbreviations

610 \AtBeginDocument{%
611   \ifpackageloaded{hyperref}{%
612     \def\@wrlab#1#2{%
613       \protected@write\@labfile{%
614         {\string\indexentry{[#1] #2|hyperpage}{\thepage}}%
615       }
616       \@esphack}%
617     \def\@wrlab#1#2{%
618       \protected@write\@labfile{%
619         {\string\indexentry{[#1] #2}{\arabic{page}}}%
620       }
621       \@esphack}%
622   }% Some macros used to generate cataloging information.
623 \AtBeginDocument{%
624   \ifpackageloaded{hyperref}{%
625     \def\coppe@bibEnd{%
626       \immediate\write\@auxout{%
627         \string\newlabel{bib:end}{\arabic{page}}{page.\arabic{page}}}%
628     }
629     \def\coppe@bibBegin{%
630       \immediate\write\@auxout{%
631         \string\newlabel{bib:begin}{\arabic{page}}{page.\arabic{page}}}%
632     }
633     \def\coppe@mainBegin{%
634       \immediate\write\@auxout{%
635         \string\newlabel{front:pageno}{\Roman{page}}{page.\roman{page}}}%
636     }
637     \def\coppe@hasLof{%
638       \immediate\write\@auxout{%
639         \string\newlabel{cat:lofflag}{\simil.;}{page.\roman{page}}}%
640     }
641   }%
642   \def\coppe@bibEnd{%
643     \immediate\write\@auxout{%
644       \string\newlabel{bib:end}{\arabic{page}}}%
645   }
646   \def\coppe@bibBegin{%
647     \immediate\write\@auxout{%
648       \string\newlabel{bib:begin}{\arabic{page}}}%
649   }
650   \def\coppe@mainBegin{%
651     \immediate\write\@auxout{%
652       \string\newlabel{front:pageno}{\Roman{page}}}%
653   }
654   \def\coppe@hasLof{%
655     \immediate\write\@auxout{%
656       \string\newlabel{cat:lofflag}{\simil.;}}%
657   }
658 }

```

```

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

677 \newenvironment{theglossary}{%
678     \if@twocolumn%
679     \@restonecoltrue\onecolumn%
680     \else%
681     \@restonecolfalse%
682     \fi%
683     \@mkboth{\MakeUppercase\glossaryname}%
684     {\MakeUppercase\glossaryname}%
685     \chapter*{\glossaryname}%
686     \addcontentsline{toc}{chapter}{\glossaryname}
687     \list{}
688     {\setlength{\listparindent}{0in}%
689     \setlength{\labelwidth}{1.0in}%
690     \setlength{\leftmargin}{1.5in}%
691     \setlength{\labelsep}{0.5in}%
692     \setlength{\itemindent}{0in}}%
693     \sloppy}%
694     {\if@restonecol\twocolumn\fi%
695 \endlist}
696 %
697 \renewenvironment{theindex}{%
698     \if@twocolumn
699     \@restonecolfalse
700     \else
701     \@restonecoltrue
702     \fi
703     \twocolumn[\@makeschapterhead{\indexname}]%
704     \@mkboth{\MakeUppercase\indexname}%
705     {\MakeUppercase\indexname}%

```

```

706 \thispagestyle{plain}\parindent\z@
707 \addcontentsline{toc}{chapter}{\indexname}
708 \parskip\z@ \@plus .3\p@\relax
709 \columnseprule \z@
710 \columnsep 35\p@
711 \let\item\@idxitem}
712 {\if@restonecol\onecolumn\else\clearpage\fi}
713 \newcommand\glossaryname{Glossary}
714 \newcommand\listabbreviationname{Lista de Abreviaturas}
715 \newcommand\listsymbolname{Lista de S{\` i}mbolos}
716 %
717 \newcommand\local@advisorstring{Orientador}
718 \newcommand\foreign@advisorstring{Advisor}
719 \ifthenelse{\boolean{maledoc}}{%
720 \newcommand\local@approvedname{Examinado por}%
721 }{%
722 \newcommand\local@approvedname{Examinada por}%
723 }
724 \newcommand\local@universityname{Universidade Federal do Rio de Janeiro}
725 \newcommand\local@deptstring{Programa}
726 \newcommand\foreign@deptstring{Department}
727 \newcommand\local@cityname{Rio de Janeiro}
728 \newcommand\local@statename{RJ}
729 \newcommand\local@countryname{Brasil}
730 %
731 \newcommand\frontcover@maintext{
732 \sloppy\nohyphens{\local@doctype\ de \@degreename\
733 \ifthenelse{\boolean{maledoc}}{apresentado}{apresentada}
734 ao Programa de P{\` o}s-gradua{\c c}{\~ a}o em \local@deptname,
735 COPPE, da \local@universityname, como parte dos requisitos
736 necess{\` a}rios {\` a} obten{\c c}{\~ a}o do t{\` i}tulo de
737 \local@degname\ em \local@deptname.}
738 }
739 %
740 \newcommand\frontpage@maintext{
741 \noindent {\MakeUppercase\local@doctype}
742 \ifthenelse{\boolean{maledoc}}{SUBMETIDO}{SUBMETIDA}
743 \sloppy\nohyphens{AO CORPO DOCENTE DO INSTITUTO ALBERTO LUIZ COIMBRA
744 DE P{\` O}S-GRADUA{\c C}{\~ A}O E PESQUISA DE ENGENHARIA (COPPE) DA
745 UNIVERSIDADE FEDERAL DO RIO DE JANEIRO COMO PARTE DOS REQUISITOS
746 NECESS{\` A}RIOS PARA A OBTEN{\c C}{\~ A}O DO GRAU DE
747 {\MakeUppercase\local@degname} EM CI{\` E}NCIAS EM
748 {\MakeUppercase\local@deptname.\par}}%
749 }
750 %
751 \newcommand\frontpage@bottomtext{%
752 \begin{center}
753 {\MakeUppercase{\local@cityname, \local@statename\ -- \local@countryname}}\par
754 {\MakeUppercase\local@monthname\ DE \number\year}
755 \end{center}%
756 }
757 %
758 \newcommand\abstract@toptext{%
759 \noindent Resumo \ifthenelse{\boolean{maledoc}}{do}{da}

```

```

760 \local@doctype\ \ifthenelse{\boolean{maledoc}}{apresentado}{apresentada}
761 \sloppy\nohyphens{{\' a} COPPE/UFRJ como parte dos requisitos
762 necess{{\' a}rios para a obten{{\c c}{{\~ a}o do grau de
763 \local@degname\ em Ci{{\^ e}ncias (\@degree)}}
764 }
765 \newcommand\foreignabstract@toptext{%
766 \noindent \sloppy\nohyphens{Abstract of \foreign@doctype\ presented to
767 COPPE/UFRJ as a partial fulfillment of the requirements for the
768 degree of \foreign@degname\ of Science (\@degree)}}
769 }
770 %
771 </class>
772 <*glossary>
773 actual '='
774 quote '!'
775 level '>'
776 delim_0 ", p. "
777 lethead_flag 0
778 headings_flag 0
779 preamble
780 "\n\\begin{theglossary}\n \\\makeatletter"
781 postamble
782 "\n \\\end{theglossary}\n"
783 </glossary>

```

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- [6] William Strunk, Jr. and E. B. White. *The Elements of Style*. Macmillan, 3 edition, 1979.
- [7] T<sub>EX</sub> Frequently Asked Questions.

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