

The tvthesis class*

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Abstract

The tvthesis class provides a complete $\text{\LaTeX}$ document class for typesetting Master's and Ph.D. theses at the Università degli Studi di Roma "Tor Vergata". It features the official university seal (rendered in $\text{\textit{TikZ}}$), support for bilingual title pages (Italian and English), and customisable layouts for both thesis types. The Ph.D. layout uses a custom book format (17×24 cm), while the Master's layout defaults to A4 paper.

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1 Introduction

The `tvthesis` class is designed for students writing their thesis at the Università degli Studi di Roma “Tor Vergata”.

Two thesis types are supported:

master	Master's thesis (Laurea Magistrale). Uses A4 paper with generous margins.
phd	Ph.D. thesis (default). Uses a custom book format (17 × 24 cm).

2 Usage

2.1 Loading the class

Load the class with:

```
\documentclass[<options>]{tvthesis}
```

2.2 Class options

master	Selects the Master's thesis layout (A4 paper).
phd	Selects the Ph.D. thesis layout (default).
english	Sets all labels to English.
italian	Sets all labels to Italian.
lof	Automatically appends a List of Figures after the Table of Contents.
lot	Automatically appends a List of Tables after the Table of Contents.
binding=<i><length></i>	Adds extra binding offset (e.g. <code>binding=1cm</code>).
a4paper	(Ph.D. only) Embeds the book-format layout in A4 paper.
letterpaper	(Ph.D. only) Embeds the book-format layout in letter paper.
showcrop	Shows crop marks (requires <code>a4paper</code> or <code>letterpaper</code>).

showmargins	Draws margin frames for debugging.
oneside	One-sided printing.
twoside	Two-sided printing (default for Ph.D.).
draft	Passed to the underlying book class.
fem	Selects the feminine form for the candidate label (Italian).
nodefautfont	Disables the default font setup (Libertine + Cantarell).

2.3 Preamble commands

2.3.1 Common commands

\title{<text>}	The thesis title (standard L ^A T _E X).
\subtitle{<text>}	An optional subtitle.
\alttitle{<text>}	An alternative title (e.g. translation).
\author{<name>}	The author's name (standard L ^A T _E X).
\advisor{<name>}	Thesis advisor. Can be called multiple times.
\coadvisor{<name>}	Co-advisor. Can be called multiple times.
\AcademicYear{<year>}	The academic year (e.g. 2024/2025). Required.

2.3.2 Master-specific commands

\courseorganizer{<text>}	The faculty or school (e.g. Facolt\ 'a di Ingegneria).
\course{<text>}	The degree programme.
\IDnumber{<id>}	Student ID number (matricola).

2.3.3 Ph.D.-specific commands

\doctorate{<field>}	The doctoral programme (e.g. Computer Science).
\cycle{<roman>}	The cycle number in Roman numerals (e.g. XXXVII I).
\committeemember{<name>}	A committee member. Can be called multiple times.
\reviewer{<name>}	An external reviewer. Can be called multiple times.
\authoremail{<email>}	Author's e-mail (shown on the address page). Required.
\authoraddress{<text>}	Author's postal address (use \\ for line breaks).
\website{<url>}	Author's website.

2.3.4 Label customisation

`\customadvisorlabel{<text>}`

Overrides both singular and plural advisor labels.

`\customcoadvisorlabel{<text>}`

Overrides both singular and plural co-advisor labels.

`\customdirectorlabel{<text>}`

Overrides both singular and plural director labels.

2.4 Document structure

A typical document follows this structure:

```
\documentclass[master,english,lof,lot]{tvthesis}
% ... preamble commands ...
\begin{document}
\maketitle
\frontmatter
\dedication{To my family}
\tableofcontents
\begin{abstract} ... \end{abstract}
\begin{acknowledgments} ... \end{acknowledgments}
\mainmatter
\chapter{Introduction} ...
% ... chapters ...
\end{document}
```

2.5 Front matter environments

`abstract` (*env.*) The `abstract` environment typesets a titled abstract page. An optional argument overrides the title.

`acknowledgments` (*env.*) The `acknowledgments` environment typesets a titled acknowledgments page. An optional argument overrides the title.

`\dedication` `\dedication{<text>}` produces a right-aligned dedication page.

`\remove` `\remove{<text>}` swallows its argument (useful for commenting out blocks of text).

3 Implementation

3.1 Identification

```
1 <*class>
2 \NeedsTeXFormat{LaTeX2e}[2009/01/01]
3 \ProvidesClass{tvthesis}%
4 [2026/07/21 v1.1 University of Rome Tor Vergata thesis class]
```

3.2 Options

Class options are processed with `xkeyval` to support key-value syntax (e.g. `binding=1cm`). Boolean flags control the thesis type, page layout, language, and visual features. Any unrecognised option is forwarded to the underlying book class.

```

5 \RequirePackage{xkeyval}
6 \newlength{\TV@binding}
7 \newif\ifTV@nodefaultfont \TV@nodefaultfontfalse
8 \newif\ifTV@customlanguage \TV@customlanguagefalse
9 \newif\ifTV@femaleauthor \TV@femaleauthorfalse
10 \newif\ifTV@master \TV@masterfalse
11 \newif\ifTV@phd \TV@phdtrue
12 \newif\ifTV@showcrop \TV@showcropfalse
13 \newif\ifTV@showmargins \TV@showmarginfalse
14 \newif\ifTV@apaper \TV@apaperfalse
15 \newif\ifTV@letterpaper \TV@letterpaperfalse
16 \newif\ifTV@lof \TV@loffalse
17 \newif\ifTV@lot \TV@lotfalse
18
19 \newcommand{\TV@customlanguage}{}
20 \newcommand{\TV@CandidateText}{\ifTV@femaleauthor\TV@CandidateLabelFemale\else}
21 \define@key[tv]{}{italian}[]{\TV@customlanguagetrue}
22 \renewcommand{\TV@customlanguage}{\TV@italian}
23 \define@key[tv]{}{english}[]{\TV@customlanguagetrue}
24 \renewcommand{\TV@customlanguage}{\TV@english}
25 \define@key[tv]{}{fem}[]{\TV@femaleauthortrue}
26 \define@key[tv]{}{nodefaultfont}[]{\TV@nodefaultfonttrue}
27 \define@key[tv]{}{binding}[0pt]{\setlength{\TV@binding}{#1}}
28 \define@key[tv]{}{draft}[]{\PassOptionsToClass{draft}{book}}
29 \define@key[tv]{}{oneside}[]{\PassOptionsToClass{oneside}{book}}
30 \define@key[tv]{}{twoside}[]{}
31 \define@key[tv]{}{master}[]{\TV@mastertrue\TV@phdfalse}
32 \define@key[tv]{}{phd}[]{\TV@phdtrue\TV@masterfalse}
33 \define@key[tv]{}{a4paper}[]{\TV@apapertrue}
34 \define@key[tv]{}{letterpaper}[]{\TV@letterpapertrue}
35 \define@key[tv]{}{showcrop}[]{\TV@showcroptrue}
36 \define@key[tv]{}{showmargins}[]{\TV@showmargintrue}
37 \define@key[tv]{}{lof}[]{\TV@loftrue}
38 \define@key[tv]{}{lot}[]{\TV@lottrue}
39
40 \DeclareOptionX*{\ClassError{tvthesis}{Option '\CurrentOption'%
41 \MessageBreak is not valid}{Remove '\CurrentOption' %
42 from class options}}
43 \ProcessOptionsX[tv]<>

```

3.3 Base class

All remaining options are forwarded to the book class, which provides the chapter/section hierarchy, \frontmatter/\mainmatter switches, and two-sided printing support.

```
44 \LoadClass[11pt]{book}
```

3.4 Page layout

The page geometry depends on the thesis type:

- **Ph.D.** A custom book format (17 × 24 cm) with optional embedding in A4 or letter paper via the a4paper/letterpaper options. Crop marks can be shown with showcrop.

- **Master's** Standard A4 paper with generous margins tuned for double-sided printing.

In both cases, an optional binding offset shifts the text block towards the outer edge to accommodate physical binding.

```

45 \RequirePackage{geometry}
46
47 \ifTV@master
48   \geometry{a4paper,
49     textwidth=396pt,
50     textheight=641pt,
51     marginparsep=12pt,
52     bindingoffset=\TV@binding,
53     vmarginratio=55:89,
54     includehead,
55     marginparwidth=72pt,
56     heightrounded}
57   \if@twoside\geometry{hmarginratio=55:89}\fi
58 \else
59   \geometry{twoside,
60     left=2.5cm,
61     hmarginratio=2:1,
62     includemp,
63     marginparwidth=0pt,
64     bottom=2.5cm,
65     paperheight=24cm,
66     paperwidth=17cm,
67     layoutheight=24cm,
68     layoutwidth=17cm,
69     headheight=13.6pt}
70 \ifTV@apaper
71   \geometry{paper=a4paper,
72     layoutoffset=\dimexpr0.5\paperwidth-0.5\Gm@layoutwidth,
73     layoutvoffset=\dimexpr0.5\paperheight-0.5\Gm@layoutheight}
74 \fi
75 \ifTV@letterpaper
76   \geometry{paper=letterpaper,
77     layoutoffset=\dimexpr0.5\paperwidth-0.5\Gm@layoutwidth,
78     layoutvoffset=\dimexpr0.5\paperheight-0.5\Gm@layoutheight}
79 \fi
80 \fi
81
82 \ifTV@showcrop\geometry{showcrop}\fi
83 \ifTV@showmargins\geometry{showframe}\fi

```

3.5 Package loading

The class loads a carefully curated set of packages.

Fonts. The default font stack uses Linux Libertine (body), Cantarell (sans-serif headings), Inconsolata (teletype/monospaced), and Libertine Math (mathematics). Under XeTeX or LuaTeX, fontspec is loaded instead, and the user is expected to configure fonts manually. The `nodefautlfont` option disables the entire font setup, allowing full

customisation. UTF-8 input encoding is always enabled for pdf^{La}T_EX to support accented characters (essential for Italian).

Typography. The microtype package enables character protrusion and font expansion for improved line breaking and visual quality. The enumitem package is loaded with noitemsep set globally, giving all list environments compact vertical spacing.

```

84 \RequirePackage{ifxetex}
85 \RequirePackage{amsmath}
86
87 \ifxetex
88   \RequirePackage{fontspec}
89 \else
90   \RequirePackage[utf8]{inputenc}
91   \ifTV@nodelatexfont\relax\else
92     \RequirePackage[T1]{fontenc}
93     \RequirePackage{textcomp}
94     \RequirePackage{libertine}
95     \RequirePackage[defaultsans]{cantarell}
96     \RequirePackage[scaled=0.96]{inconsolata}
97     \RequirePackage{libertinust1math}
98   \fi
99 \fi
100
101 \RequirePackage{graphicx}
102 \RequirePackage{color}
103 \RequirePackage{booktabs}
104 \RequirePackage{etoolbox}
105 \RequirePackage{tikz}
106 \RequirePackage{setspace}
107 \RequirePackage{microtype}
108 \RequirePackage{titlesec}
109 \RequirePackage{enumitem}
110 \setlist{noitemsep}

```

3.6 Figure and table captions

Caption formatting uses small bold labels separated by a period (e.g. “**Figure 3.1.** Description”) with small body text. The floatrow package enforces the standard convention: figure captions are always placed *below* the figure, and table captions are always placed *above* the table, regardless of where the user writes `\caption` in their source.

```

111 \RequirePackage{caption}
112 \captionsetup[indention=\parindent,labelfont={small,bf},labelsep=period,%
113   textfont={small}]
114 \RequirePackage{floatrow}
115 \floatsetup[figure]{capposition=bottom}
116 \floatsetup[table]{capposition=top}

```

3.7 Line spacing

A 1.5 baseline stretch is used throughout the document, which is the standard requirement for most Italian university theses. The bibliography overrides this to single spacing (see below).

```
117 \renewcommand{\baselinestretch}{1.5}
```

3.8 Official colours

The official university colours defined in the visual identity manual (*Identità Visiva*). `verdetv` is the primary institutional green used for the seal and headings; `nerotv` is the near-black used for body text in the seal.

```
118 \definecolor{verdetv}{RGB}{0,125,52}
119 \definecolor{nerotv}{RGB}{29,29,27}
```

3.9 TikZ tower logo

The university seal (*sigillo di ateneo*) is drawn entirely in TikZ, eliminating the need for external image files. The design reproduces the official stylised tower from the visual identity guidelines at web.uniroma2.it/it/percorso/identita_visiva.

The `\tower` command draws the tower at its natural size; it is pre-rendered into a saved box (`\TV@towerbox`) at class-load time for efficiency, since the seal appears on every title page.

`\tower`

```
120 \newcommand{\tower}{%
121 \begin{tikzpicture}
122   \draw[fill=verdetv,draw=white] (-1.85,-3) rectangle (2.4,2.8);
123   \filldraw[fill=white,draw=white] (-1.85,2.8) -- (1,2.8) -- (1,0) -- (-1.85,0);
124   \filldraw[fill=white,draw=white] (1,0) arc (360:240:1.9) -- (-1.85,0);
125   \def\TV@towerScaleA{0.45}%
126   \foreach \i in {0,...,6} {
127     \draw[fill=verdetv,draw=verdetv] (-1.85,-0.55+\TV@towerScaleA*\i)
128       rectangle (-0.05,-0.3+\TV@towerScaleA*\i);
129   }
130   \def\TV@towerScaleB{0.4}%
131   \foreach \i in {0,...,4}
132     \draw[fill=verdetv,draw=verdetv] (-1.85+\TV@towerScaleB*\i,2.65)
133       rectangle (-1.65+\TV@towerScaleB*\i,2.8);
134 \end{tikzpicture}
135 }
```

Pre-render the tower into a saved box.

```
136 \newsavebox\TV@towerbox
137 \sbox\TV@towerbox{%
138   \begin{minipage}[b]{1.8cm}%
139     \resizebox{\linewidth}{!}{\tower}%
140   \end{minipage}%
141 }
```

`\TV@rendertitlelogo` The title page logo block follows the official *sigillo di ateneo*: the tower is to the left, taller than the text block, with the text vertically centred on it. “TOR VERGATA” is the dominant line; “UNIVERSITÀ DEGLI STUDI DI ROMA” is smaller and letter-spaced to match its width.

```
142 \newcommand{\TV@rendertitlelogo}{%
143   \sbox0{\fontsize{30}{36}\selectfont\textcolor{verdetv}{TOR VERGATA}}%
144   \sbox2{}
```

```

145 \begin{tabular}[b]{@{}l@{}}
146 \usebox0 \\\[1pt]
147 \resizebox{\wd0}{0.5\ht0}{%
148 \textcolor{verdetv}{UNIVERSIT\`A DEGLI STUDI DI ROMA}}
149 \end{tabular}%
150 }%
151 \dimen0=1.3\dimexpr\ht2+\dp2\relax%
152 \sbox4{\resizebox{!}{\dimen0}{\usebox\TV@towerbox}}%
153 \dimen2=\dimexpr(\ht4+\dp4-\ht2-\dp2)/2+4pt\relax%
154 \usebox4%
155 \hspace{1.5em}%
156 \raisebox{\dimen2}{\usebox2}%
157 }

```

3.10 Headers and footers

The class defines two page styles via fancyhdr:

TV@mainstyle Running headers with chapter/section marks and page numbers in the outer corners. Activated by `\mainmatter`.

plain Completely blank headers and footers, used for chapter-opening pages and the front matter.

Additionally, `\cleardoublepage` is redefined so that the blank verso pages inserted for two-sided printing are truly empty (no headers, footers, or page numbers).

```

158 \def\cleardoublepage{\clearpage\if@twoside \ifodd\c@page\else
159 \thispagestyle{empty}\hbox{}\newpage\fi\fi}
160
161 \RequirePackage{fancyhdr}

```

The main page style shows chapter/section marks in the header.

```

162 \fancypagestyle{TV@mainstyle}{%
163 \pagestyle{fancy}
164 \renewcommand{\chaptermark}[1]{\markboth{%
165 \ifnum \c@chapter>0 \thechapter.\ ##1 \else ##1 \fi}}{}
166 \renewcommand{\sectionmark}[1]{\markright{\thesection\ ##1}}{}
167 \fancyhf{}
168 \fancyhead[OR]{\small\bfseries\thepage}
169 \fancyhead[OL]{\small\bfseries\nouppercase{\rightmark}}
170 \if@twoside
171 \fancyhead[ER]{\small\bfseries\nouppercase{\leftmark}}
172 \fancyhead[EL]{\small\bfseries\thepage}
173 \fi
174 \renewcommand{\headrulewidth}{0.4pt}
175 \renewcommand{\footrulewidth}{0pt}

```

The plain style (chapter opening pages) is completely empty.

```

176 \fancypagestyle{plain}{%
177 \renewcommand{\headrulewidth}{0pt}
178 \fancyhf{}}

```

3.11 Numbering and chapter formatting

Equations, figures, and tables are numbered within chapters (e.g. “Equation 3.1”). Chapter headings use a display format with a ruled line below the title, set in \Huge bold.

```
179 \numberwithin{equation}{chapter}
180 \numberwithin{figure}{chapter}
181 \numberwithin{table}{chapter}
182
183 \titleformat{\chapter}[display]
184 {\bfseries\Large\filleft}
185 {\filleft\scshape{\chaptertitlename} \thechapter}
186 {6pt}
187 {\Huge\bfseries}
188 [\vspace{25pt}\titlerule]
```

3.12 User commands

The following commands are intended for use in the document preamble. They store metadata that is later used to typeset the title pages. Simple scalar values (title, subtitle, etc.) are stored in macros via \def; multi-valued fields (advisors, reviewers, committee members) use TeX token lists so that successive calls append entries separated by \[1mm].

```
189 \def\TV@subtitle{}
190 \def\TV@alttitle{}
191 \newcommand{\subtitle}[1]{\def\TV@subtitle{#1}}
192 \newcommand{\alttitle}[1]{\def\TV@alttitle{#1}}
193
194 \def\TV@courseorganizerLabel{}
195 \def\TV@courseLabel{}
196 \def\TV@thesissubject{}
197 \newcommand{\courseorganizer}[1]{\def\TV@courseorganizerLabel{#1}}
198 \newcommand{\course}[1]{\def\TV@courseLabel{#1}}
199 \newcommand{\thesissubject}[1]{\def\TV@thesissubject{#1}}
200
201 \def\TV@doctorate{}
202 \newcommand{\doctorate}[1]{\def\TV@doctorate{#1}}
203
204 \def\TV@cycle{}
205 \newcommand{\cycle}[1]{\def\TV@cycle{#1}}
206
207 \def\TV@AcademicYear{}
208 \newcommand{\AcademicYear}[1]{\def\TV@AcademicYear{#1}}
209 \let\submitdate\AcademicYear
210
211 \def\TV@IDnumber{}
212 \newcommand{\IDnumber}[1]{\def\TV@IDnumber{#1}}
```

Advisors, co-advisors, reviewers, committee members, and directors are stored in token lists to support multiple entries.

```
213 \newcount\TV@advisorcount
214 \newtoks\TV@advisortoks
215 \newcommand{\advisor}[1]{%
216   \ifnum\TV@advisorcount=\z@
```

```

217 \TV@advisortoks={#1}%
218 \else
219 \TV@advisortoks=\expandafter{\the\TV@advisortoks\\[1mm]#1}%
220 \fi
221 \advance\TV@advisorcount\@ne}
222
223 \newcommand{\customadvisorlabel}[1]{%
224 \newcommand{\TV@ThesisAdvisorLabel}{#1}%
225 \newcommand{\TV@ThesisAdvisorsLabel}{#1}}
226
227 \newcount\TV@coadvisorcount
228 \newtoks\TV@coadvisortoks
229 \newcommand{\coadvisor}[1]{%
230 \ifnum\TV@coadvisorcount=\z@
231 \TV@coadvisortoks={#1}%
232 \else
233 \TV@coadvisortoks=\expandafter{\the\TV@coadvisortoks\\[1mm]#1}%
234 \fi
235 \advance\TV@coadvisorcount\@ne}
236
237 \newcommand{\customcoadvisorlabel}[1]{%
238 \newcommand{\TV@ThesisCoAdvisorLabel}{#1}%
239 \newcommand{\TV@ThesisCoAdvisorsLabel}{#1}}
240
241 \newcount\TV@reviewercount
242 \newtoks\TV@reviewertoks
243 \newcommand{\reviewer}[1]{%
244 \ifnum\TV@reviewercount=\z@
245 \TV@reviewertoks={#1}%
246 \else
247 \TV@reviewertoks=\expandafter{\the\TV@reviewertoks\\[1mm]#1}%
248 \fi
249 \advance\TV@reviewercount\@ne}
250
251 \newcount\TV@committeecount
252 \newtoks\TV@committeetoks
253 \newcommand{\committeemember}[1]{%
254 \ifnum\TV@committeecount=\z@
255 \TV@committeetoks={#1}%
256 \else
257 \TV@committeetoks=\expandafter{\the\TV@committeetoks\\[1mm]#1}%
258 \fi
259 \advance\TV@committeecount\@ne}
260
261 \newcount\TV@directorcount
262 \newtoks\TV@directortoks
263 \newcommand{\director}[1]{%
264 \ifnum\TV@directorcount=\z@
265 \TV@directortoks={#1}%
266 \else
267 \TV@directortoks=\expandafter{\the\TV@directortoks\\[0.75mm]#1}%
268 \fi
269 \advance\TV@directorcount\@ne}
270

```

```

271 \newcommand{\customdirectorlabel}[1]{%
272     \newcommand{\TV@ThesisDirectorLabel}{#1}%
273     \newcommand{\TV@ThesisDirectorsLabel}{#1}}
274
275 \def\TV@authoremail{}
276 \newcommand{\authoremail}[1]{\def\TV@authoremail{#1}}
277
278 \def\TV@authoraddress{}
279 \newcommand{\authoraddress}[1]{\def\TV@authoraddress{#1}}
280
281 \def\TV@website{}
282 \newcommand{\website}[1]{\def\TV@website{#1}}

```

3.13 Utility commands

`\remove` The `\remove{<text>}` command swallows its argument, providing a convenient way to comment out large blocks of text without resorting to the comment package.

```

283 \newcommand{\remove}[1]{}

```

3.14 Dedication, abstract, acknowledgments

These commands and environments produce the standard front-matter pages. Each starts on a new recto page (via `\cleardoublepage`).

`\dedication{<text>}` Produces a right-aligned, italicised dedication in the vertical “golden section” of the page.

`abstract environment ([<title>])` A titled abstract page. The optional argument overrides the default language-dependent title.

`acknowledgments environment ([<title>])` Same as `abstract`, for the acknowledgments.

```

284 \providecommand*\dedication[1]{%
285 \cleardoublepage
286 \thispagestyle{empty}
287 \null\vspace{\stretch{0.26}}
288 \begin{flushright}
289 \textit{#1}
290 \end{flushright}
291 \vspace{\stretch{0.74}}\null}
292
293 \newenvironment{abstract}[1][\TV@AbstractLabel]
294 {\cleardoublepage\thispagestyle{plain}
295 \noindent{\Large\bfseries #1}\par\vspace{0.5cm}\noindent\ignorespaces}
296 {\null\ignorespacesafterend}
297
298 \newenvironment{acknowledgments}[1][\TV@AcknowledgmentsLabel]
299 {\cleardoublepage\thispagestyle{plain}
300 \noindent{\Large\bfseries #1}\par\vspace{0.5cm}\noindent\ignorespaces}
301 {\null\ignorespacesafterend}

```

3.15 Front matter and main matter hooks

The front matter uses the plain page style; the main matter activates running headers. The `lof` and `lot` options automatically append lists after `\tableofcontents`.

```
302 \g@addto@macro\frontmatter{\pagestyle{plain}}
303 \g@addto@macro\mainmatter{\pagestyle{TV@mainstyle}}
304
305 \let\TV@oldtableofcontents\tableofcontents
306 \renewcommand{\tableofcontents}{%
307   \TV@oldtableofcontents
308   \ifTV@lof\listoffigures\fi
309   \ifTV@lot\listoftables\fi
310 }
```

3.16 Bibliography redefinition

The `\bibliography` command is redefined to:

1. Set the bibliography in single spacing with a small font size, saving vertical space.
2. Add a “Bibliography” entry to the table of contents via `\phantomsection` and `\addcontentsline`.
3. Update the running headers to show “Bibliography” in small caps.

```
311 \let\TV@oldbibliography\bibliography
312 \renewcommand{\bibliography}[1]{%
313   \markboth{\textsc{\bibname}}{\textsc{\bibname}}
314   \begin{small}
315     \begin{spacing}{1}
316     \phantomsection
317     \addcontentsline{toc}{chapter}{\bibname}
318     \TV@oldbibliography{#1}
319     \end{spacing}
320   \end{small}
321 }
```

3.17 Hyperref configuration

`hyperref` is loaded with hidden links (no coloured boxes) and page-level back-references in the bibliography. The `plainpages=false` and `pdfpagelabels` options work together with the `\pagenumbering{Alph}` call in `\maketitle` to ensure that every page has a unique label, preventing back-reference links from pointing to the wrong page.

The `\backrefalt` macro is customised to display back-references as “(cited on page X.)” or “(cited on pages X, Y.)”.

```
322 \RequirePackage[%
323   pagebackref,
324   plainpages=false,
325   hypertexnames=true,
326   pdfpagelabels,
327   bookmarks,
```

```

328     bookmarksopen=false,
329     bookmarksnumbered=true,
330     breaklinks=true,
331     linktocpage,
332     colorlinks=false,
333     hidelinks,
334     hyperindex=true]{hyperref}
335
336 \renewcommand*{\backreflastsep}{, }
337 \renewcommand*{\backreftwosep}{, }
338 \renewcommand*{\backref}[1]{}
339 \renewcommand*{\backrefalt}[4]{%
340   \ifcase #1 %
341     \relax
342   \or
343     (cited on page~#2.)%
344   \else
345     (cited on pages #2.)%
346   \fi%
347 }

```

3.18 Ph.D. title pages

The Ph.D. thesis has a three-page title sequence:

1. **Cover page** — university seal, doctoral programme, cycle, title, subtitle, candidate name, and academic year.
2. **Committee page** — thesis committee members, advisor, and external reviewers.
3. **Address page** — author’s e-mail, postal address, and website.

All three pages use the empty page style and centred (symmetric) margins via `\newgeometry`. Font sizes are explicitly set to ensure consistent appearance across different base font sizes.

```

348 \newcommand{\TV@maketitlePhD}{%
349 \pagestyle{empty}%
350 \newgeometry{hmarginratio=1:1}%
351 \def\TV@fs@normal{\@setfontsize\TV@fs@normal\@xipt{10}}%
352 \def\TV@fs@large{\@setfontsize\TV@fs@large\@xipt{14}}%
353 \def\TV@fs@Large{\@setfontsize\TV@fs@Large\@xivpt{18}}%
354 \def\TV@fs@LARGE{\@setfontsize\TV@fs@LARGE\@xvipt{20}}%
355 %%% Cover Page
356 \vspace*{5mm}
357 \begin{center}
358   \TV@rendertitlelogo
359   \vspace{10mm}
360
361   \textsc{\TV@fs@large \TV@DottoratoHeader}\[2mm]%
362   \TV@cycle\ \TV@cycleLabel}\[5mm]
363
364   \vfill
365   {\TV@fs@Large \textbf{\@title}}\par}
366   \if|\TV@subtitle|\relax\else

```

```

367     \vspace{0.4cm}
368     {\TV@fs@large\TV@subtitle\par}
369 \fi
370 \vfill
371
372 {\TV@fs@Large \@author}
373
374 \vfill
375 \textsc{{\TV@fs@large \TV@AcademicYear}}
376 \end{center}
377 \cleardoublepage
378 %%% Internal Page
379 \vspace*{5mm}
380 \begin{center}
381 \TV@rendertitlelogo
382 \vspace{10mm}
383
384 \textsc{{\TV@fs@large \TV@DottoratoHeader}\[2mm]%
385 \TV@cycle\ \TV@cycleLabel}}\[5mm]
386
387 \vfill
388 {\TV@fs@Large \@author \par}
389 \vfill
390
391 {\TV@fs@Large \textbf{\@title} \par}
392 \if|\TV@subtitle|\relax\else
393 \vspace{0.3cm}
394 {\TV@fs@large\TV@subtitle\par}
395 \fi
396 \vspace*{0.5cm}
397
398 \begin{tabular}[t]{c}{\hspace{10mm}}c}
399 \begin{tabular}[t]{l}
400 \multicolumn{1}{c}{\textbf{\TV@CommitteeHeader}}\[5mm]
401 \the\TV@advisorstoks\ (\TV@AdvisorHeaderLabel) \\\
402 \ifnum\TV@committeecount>\z@
403 \the\TV@committeetoks \\\
404 \fi
405 \end{tabular}%
406 &%
407 \ifnum\TV@reviewercount>\z@
408 \begin{tabular}[t]{l}
409 \multicolumn{1}{c}{\textbf{\TV@ReviewerHeaderLabel}}\[5mm]
410 \the\TV@reviewertoks \\\
411 \end{tabular}
412 \fi
413 \end{tabular}
414
415 \vfill
416 \textsc{{\TV@fs@large \TV@AcademicYear}}
417 \end{center}
418 \clearpage
419 \restoregeometry
420 %%% Author Address Page

```

```

421 \begin{raggedright}
422 \vspace*{\fill}
423 {\TV@fs@normal
424   \textsc{\TV@AddressHeader} \\
425   \@author \\
426   \TV@authoraddress \\
427   \textsc{e-mail:} \texttt{\TV@authoremail}\\
428   \if|\TV@website|\relax\else\textsc{www:} \texttt{\TV@website}\fi}\par
429 \vspace*{2cm}
430 \end{raggedright}
431 \clearpage
432 }

```

3.19 Master's title page

The Master's thesis has a single title page showing the university seal, faculty and degree programme, thesis title, author with student ID, advisor(s), co-advisor(s), and academic year. Symmetric margins are applied with `\newgeometry` and restored afterwards. The `titlepage` environment is *not* used, to avoid the page counter reset that would break hyperref back-references.

```

433 \newcommand{\TV@maketitleMaster}{%
434 \clearpage
435 \thispagestyle{empty}%
436 \newgeometry{hmarginratio=1:1}
437
438 \linespread{1}\selectfont
439 \parindent=0pt
440
441 \begin{center}
442 {\bfseries\large UNIVERSIT\`A DEGLI STUDI DI ROMA TOR VERGATA}\\[2mm]
443 {\large\scshape \TV@courseorganizerLabel}
444 \end{center}
445
446 \vspace{4mm}
447
448 \begin{center}
449 \TV@rendertitlelogo
450 \end{center}
451
452 \vspace{4mm}
453
454 \begin{center}
455 {\scshape \TV@CorsoDiStudioHeader}\\[1mm]
456 {\large\MakeUppercase{\TV@courseLabel}}%
457 \if|\TV@thesissubject|\relax\else
458   \\[3mm]
459   {\scshape \TV@TesiDiLaureaInHeader}\\[1mm]
460   {\large \TV@thesissubject}%
461 \fi
462 \end{center}
463
464 \vspace{\stretch{1}}
465

```

```

466 \begin{center}
467 {\LARGE\bfseries\linespread{1.1}\selectfont\@title\par}
468 \if|\TV@subtitle|\relax\else
469   \vspace{0.4cm}
470   {\large\linespread{1.1}\selectfont\TV@subtitle\par}
471 \fi
472 \if|\TV@alttitle|\relax\else
473   \vspace{0.8cm}
474   {\LARGE\linespread{1.1}\selectfont\TV@alttitle\par}
475 \fi
476 \end{center}
477
478 \vspace{\stretch{1}}
479
480 \begin{center}
481 \makebox[\textwidth][c]{%
482   \begin{tabular}{@{}l@{\hspace{4.0cm}}l@{}}
483     \begin{tabular}{t}{@{}l@{}}
484       \ifcase\TV@advisorcount
485         \ClassError{tvthesis}{You must specify at least one advisor in the pr
486         {E.g. \protect\advisor{Prof. Name Surname}}
487       \or
488         \textbf{\TV@ThesisAdvisorLabel:}\\[1mm]
489       \else
490         \textbf{\TV@ThesisAdvisorsLabel:}\\[1mm]
491       \fi
492       \the\TV@advisortoks
493       \ifnum\TV@coadvisorcount>\z@
494         \\[4mm]
495         \ifnum\TV@coadvisorcount=1
496           \textbf{\TV@ThesisCoAdvisorLabel:}\\[1mm]
497         \else
498           \textbf{\TV@ThesisCoAdvisorsLabel:}\\[1mm]
499         \fi
500       \the\TV@coadvisortoks
501     \fi
502   \end{tabular}%
503   &%
504   \begin{tabular}{t}{@{}l@{}}
505     \ifTV@femaleauthor
506       \textbf{\TV@CandidateLabelFemale:}\\[1mm]
507     \else
508       \textbf{\TV@CandidateLabel:}\\[1mm]
509     \fi
510     {\large\@author}\\[1mm]
511     \TV@IDnumberLabel\ \TV@IDnumber
512   \end{tabular}%
513 \end{tabular}%
514 }
515 \end{center}
516
517 \vspace{\stretch{2}}
518
519 \begin{center}

```

```

520 \TV@AcademicYearLabel\ \TV@AcademicYear
521 \end{center}
522
523 \restoregeometry
524 \clearpage
525 }

```

3.20 The `\maketitle` dispatch

`\maketitle` The `\maketitle` command validates that all required metadata has been provided (emitting `\ClassError` messages otherwise), then dispatches to the appropriate title-page builder. Before any title page is rendered, `\pagenumbering{Alph}` is called to give title pages unique labels (“A”, “B”, etc.) that do not collide with the roman numerals of the front matter or the arabic numerals of the main matter — this is essential for correct `hyperref` back-reference links.

```

526 \renewcommand{\maketitle}{%
527 \pagenumbering{Alph}%
528 \if|\TV@AcademicYear|\ClassError{tvthesis}{You must specify the %
529   academic year}{Example: \protect\AcademicYear{2024/2025}}\fi
530 \ifTV@master
531   \if|\TV@courseorganizerLabel|\ClassError{tvthesis}{You must specify %
532     the course organizer}{Example: %
533     \protect\courseorganizer{Facolt\`a di Ingegneria}}\fi
534   \if|\TV@courseLabel|\ClassError{tvthesis}{You must specify the %
535     course}{Example: \protect\course{Corso di Laurea Magistrale %
536       in Informatica}}\fi
537   \if|\TV@IDnumber|\ClassError{tvthesis}{You must specify your %
538     ID number (matricola)}{Example: \protect\IDnumber{0123456}}\fi
539   \TV@maketitleMaster
540 \else
541   \if|\TV@doctorate|\ClassError{tvthesis}{You must specify the %
542     doctorate program}{Example: \protect\doctorate{Computer Science}}\fi
543   \if|\TV@cycle|\ClassError{tvthesis}{You must specify the %
544     cycle}{Example: \protect\cycle{XXXVIII}}\fi
545   \if|\TV@authoremail|\ClassError{tvthesis}{You must specify the %
546     author’s email}{Example: \protect\authoremail{author@email.com}}\fi
547   \TV@maketitlePhD
548 \fi
549 }

```

3.21 Language strings — English

All user-visible labels are defined as macros so they can be switched between English and Italian. The `\providecommand` form is used for advisor/co-advisor/director labels so that `\customadvisorlabel` (etc.) can override them if called first. `\customadvisorlabel` (etc.) can override if called first.

```

550 \newcommand{\TV@english}{%
551   \def\TV@CandidateLabel{Candidate}%
552   \def\TV@CandidateLabelFemale{Candidate}%
553   \def\TV@IDnumberLabel{ID number:}%
554   \def\TV@CorsoDiStudioHeader{Degree Programme in}%
555   \def\TV@TesiDiLaureaInHeader{Thesis in}%

```

```

556 \providecommand{\TV@ThesisAdvisorLabel}{Advisor}%
557 \providecommand{\TV@ThesisAdvisorsLabel}{Advisors}%
558 \providecommand{\TV@ThesisCoAdvisorLabel}{Co-Advisor}%
559 \providecommand{\TV@ThesisCoAdvisorsLabel}{Co-Advisors}%
560 \providecommand{\TV@ThesisDirectorLabel}{Director}%
561 \providecommand{\TV@ThesisDirectorsLabel}{Directors}%
562 \def\TV@cycleLabel{Cycle}%
563 \def\TV@AcademicYearLabel{Academic Year}%
564 \def\TV@universityname{University of Rome Tor Vergata}%
565 \def\TV@AcknowledgmentsLabel{Acknowledgments}%
566 \def\TV@AbstractLabel{Abstract}%
567 \def\TV@DottoratoHeader{Ph.D.\ program in \TV@doctorate}%
568 \def\TV@CommitteeHeader{Thesis Committee}%
569 \def\TV@AdvisorHeaderLabel{Advisor}%
570 \def\TV@ReviewerHeaderLabel{Reviewers}%
571 \def\TV@AddressHeader{Author's address:}%
572 \def\contentsname{Contents}%
573 \def\bibname{Bibliography}%
574 \def\listfigurename{List of Figures}%
575 \def\listtablename{List of Tables}%
576 \def\chaptername{Chapter}%
577 \def\appendixname{Appendix}%
578 \def\figurename{Figure}%
579 \def\tablename{Table}%
580 }
581
582 \newcommand{\TV@italian}{%
583 \def\TV@CandidateLabel{Laureando}%
584 \def\TV@CandidateLabelFemale{Laureanda}%
585 \def\TV@IDnumberLabel{matricola:}%
586 \def\TV@CorsoDiStudioHeader{Corso di Studio in}%
587 \def\TV@TesiDiLaureaInHeader{Tesi di Laurea in}%
588 \providecommand{\TV@ThesisAdvisorLabel}{Relatore}%
589 \providecommand{\TV@ThesisAdvisorsLabel}{Relatori}%
590 \providecommand{\TV@ThesisCoAdvisorLabel}{Correlatore}%
591 \providecommand{\TV@ThesisCoAdvisorsLabel}{Correlatori}%
592 \providecommand{\TV@ThesisDirectorLabel}{Direttore}%
593 \providecommand{\TV@ThesisDirectorsLabel}{Direttori}%
594 \def\TV@cycleLabel{Ciclo}%
595 \def\TV@AcademicYearLabel{Anno Accademico}%
596 \def\TV@universityname{Universit\`a degli Studi di Roma Tor Vergata}%
597 \def\TV@AcknowledgmentsLabel{Ringraziamenti}%
598 \def\TV@AbstractLabel{Sommario}%
599 \def\TV@DottoratoHeader{Dottorato di Ricerca in \TV@doctorate}%
600 \def\TV@CommitteeHeader{Commissione di Tesi}%
601 \def\TV@AdvisorHeaderLabel{Relatore}%
602 \def\TV@ReviewerHeaderLabel{Revisori}%
603 \def\TV@AddressHeader{Indirizzo dell'autore:}%
604 \def\contentsname{Indice}%
605 \def\bibname{Bibliografia}%
606 \def\listfigurename{Elenco delle figure}%
607 \def\listtablename{Elenco delle tabelle}%
608 \def\chaptername{Capitolo}%
609 \def\appendixname{Appendice}%

```

```

610 \def\figurename{Figura}%
611 \def\tablename{Tabella}%
612 }

```

3.22 Language selection at begin-document

Language resolution is deferred to `\AtBeginDocument` so that `babel` or `polyglossia` (if loaded by the user) have had time to set `\language`. The resolution order is:

1. Explicit class option (`english` or `italian`).
2. `babel/polyglossia` main language name (e.g. if the user loads `\usepackage[italian]{babel}`).
3. English as the fallback default.

```

613 \AtBeginDocument{%
614   \ifTV@customlanguage
615     \TV@customlanguage
616   \else
617     \@ifpackageloaded{babel}{\csname TV@\language\endcsname}{%
618       \@ifpackageloaded{polyglossia}{\csname TV@\language\endcsname}{%
619         \TV@english}}
620   \fi
621 }
622
623 \endinput
624 \</class>

```

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