Documentation for the GTthesis LaTeX Document Class

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Abstract

This document contains all of the relevant information for using the GTthesis LaTeX document class. PLEASE READ THIS ENTIRE DOCUMENT BEFORE COMPLAINING THAT SOMETHING IS BROKEN AND I NEED TO FIX IT. This class is intended for use within the Georgia Tech community for thesis and dissertation proposals and for use at the Institute Level for final submission of a thesis or dissertation. To the best of the author's knowledge, the formatting produced by this template conforms to the latest requirements of the GeorgiaTech Office of Graduate Studies (hereon referred to as OGS).

1 Introduction

This class file arose out of the need to standardize the formatting requirements between the internal ECE thesis / dissertation proposal and the final thesis / dissertation that is submitted to the Office of Graduate Studies at Georgia Tech. The class file can and should be used for preparation of both documents. This template was strongly based on the gatech-thesis template provided by Charles Wilson. Recent updates have taken it further from those roots, but there are still some sections of code directly attributable to Charles, so credit should be given. Also Michael Shell (IEEE LaTeX guru) should be thanked for the current campanile graphics in `eps` and `pdf` form.

I have removed all backwards compatibility with the previous template and added some features that I feel will make the documents more professional and hopefully more readable. Major improvements include the option to use a Times Roman font (which looks a lot better than standard LaTeX CMR), the option to display a Campanile graphic on the title page (which I think looks pretty snazzy), and some improvements to the approval page for ETD documents. The main focus of this revision has been to allow this template to also be used for the proposal process within the ECE department (and possibly other departments, but I haven't made that my concern). Simply by selecting the proposal option, the document layout changes appropriately to be used for the thesis/dissertation

proposal that the department requires. Despite the fact that it was designed for the ECE department, this template can easily be used for whatever department, simply by specifying what department/school you are in (ECE students won't need to specify because School of ECE is the default). So come one, come all and use it if you like it.

This document is organized into sections that reflect the ordering of the author's class(`.cls`) file. Section 2 describes the options that can be passed to the `GTthesis` class. Section 8 describes the commands(macros) and environments that can be used in the frontmatter of your thesis document. Section 9 provides details on the commands and environments available in the body of the document. Finally, section 10 describes the EndMatter environment and what can be done within it.

2 `GTthesis` Class Options

2.1 Document Type Options

`draft` `final` The `draft` option is used to preview your document without figures and other forced formatting requirements that a final, OGS-submittable copy requires. The draft option will place the word DRAFT in the four corners of the page. EPS figures will be left out but their bounding boxes and filenames will be shown. The `final` option, which is invoked by default but can be used explicitly, provides an OGS-compatible document appropriate for final submission.

`proposal` The `proposal` option switches the document from a full thesis or dissertation to a proposal format. Margins are selected automatically in this format. The most important change from the user's perspective is that the top level sectioning commands switches from `\chapter` to `\section`. The commands `\part` and `\chapter` should NEVER be used when the `proposal` option has been selected.

`proposalwithchap` This option is used to make a proposal where the top-level section commands are chapters, formatted as they would be in a full thesis/dissertation. This option would be appropriate for a proposal document that was very long, or if one's advisor or department preferred the page separation that chapters provide.

`MS` `PhD` These options allow the selection of the degree type sought. It mainly affects the title page of the document.

2.2 Formatting and Appearance Options

`a4paper` `a5paper` `b5paper` `letterpaper` `legalpaper` `executivepaper` European paper size options. This probably shouldn't be used (unless maybe your using this at GT Lorraine).

US paper size options. Of these, `letterpaper` should be used for the final document submission to OGS. The other options would be rarely used. One word of warning is that the paper size specified here should be the same in all later processing stages. This particular applies if you are using the dvips to convert from dvi to ps formats as dvips defaults to a4 paper size. Check dvips documentation for more info.

`landscape` Switches the orientation of the entire document to landscape mode from the standard portait mode. This shouldn't be used for the final document.

`noTimes` The `noTimes` option is used to disable the use of Times Roman Fonts. Times Ro-

man is the defult for this template simply because it looks better, and therefore you shouldn't use this option unless something you typeset (most probably some type of math text) doesn't come out correctly. Another common problems is that some distributions may not contain all the necessary packages to use the Times Roman font. The following packages are required to use the fonts: textcomp, latexsym, amsmath, amsfonts, amssymb, and txfonts. Then you should try this option to see if it will correct the problem. If the `noTimes` option is selected then the font will revert to Computer Modern Roman (aka standard LaTeX). These two fonts are the only options that are currently available (and probably ever will be).

`Times` This option explicitly turns on the use of the Times Roman font. It's not usually needed as this option is selected by default and can only be turned off by the `noTimes` option.

`10pt,11pt,12pt` Selects font size for document. Default is 12pt. For Times Roman 12pt should be used in the final document (per OGS guidelines). For the Computer Modern Roman font, 11pt or 12pt are acceptable (per OGS guidelines).

`standardmargins` Select standard margins. This can be used for a final document submission according to OGS. It provides a 1 (one) inch margin on all sides of the paper.

`bindingmargins` Select binding margins. If you ever intend this document to be printed and bound (by UMI for example) then this option should be used. This is most appropriate for a PhD dissertation. The margins are set to 1.5 inches at the left (for binding) and 1 inch on the top, right and bottom.

`proposalmargins` Select proposal margins. This is the default for the proposal document. The margins are set to 1.25 inches on the left and right, and 1 inch on the top and bottom. These margins are appropriate since the proposal document will never be bound (published in a book).

`oneside` `twoside` Select whether the document will be prepared for one-sided or two-sided printing. The default is `oneside`.

`openany` `openright` Select whether the top-level headings of the document will be forced to open on a right-hand page or on any page. This option only has significance when the document is two-sided.

`singlespaced` This option sets the document line spacing to be single spaced.

`oneandahalfspaced` This option sets the document line spacing to be one-and-a-half spaced.

`doublespaced` This option sets the document line spacing to be double spaced. This option is the default line spacing and should be used for final document submission.

`continuouscount` `resetcount` These two options determine how the counting of figure, tables, equations, and footnotes are handled. If `continuouscount` is specified then these items are numbered consecutively from the beginning of the document to the end. Otherwise using `resetcount` will make enumeration of these items reset for every major heading (i.e. every chapter or section). I think both of these styles are allowed by OGS, so you can do what you think looks best. The `resetcount` option is used by default.

`leqno` `fleqn` These options were included based on their use in the LaTeX base classes. They

change placement of the equation numbering. The option `leqno` will place equation numbers on the left. The `fleqn` option will place the equations flush with the margins (I think?).

2.3 Section Inclusion/Exclusion Options

The following commands allow selective inclusion of individual sections of the document.

`titlepage` / `notitlepage` — These options are used to make the title page of the document appear or not appear in this document. The default is for the title page to be included.

`approvalpage` / `noapprovalpage` — These options are used to make the approval page of the document appear or not appear in this document. The default is for the approval page to be included.

`tableofcontents` / `notableofcontents` — These options are used to make the table of contents of the document appear or not appear in this document. The default is for the table of contents to be included.

`listoffigures` / `nolistoffigures` — These options are used to make the list of figures of the document appear or not appear in this document. The default is for the list of figures to be included.

`listoftables` / `nolistoftables` — These options are used to make the list of tables of the document appear or not appear in this document. The default is for the list of tables to be included.

`index` / `noindex` — These options are used to make the index appear at the end of the document or not appear in this document. The default is for the index to be excluded, therefore you must explicitly use the `index` option if you want the index to appear.

`glossary` / `noglossary` — These options are used to make the glossary appear at the end of the frontmatter or to be excluded. The default is for the glossary to be excluded, therefore you must explicitly use the `glossary` option if you want the glossary to appear.

`listofsymbols` / `nolistofsymbols` — These options are used to make the list of symbols appear at the end of the frontmatter or to be excluded. The default is for the list of symbols to be excluded, therefore you must explicitly use the `listofsymbols` option if you want the list of symbols to appear.

`bibliography` / `nobibliography` — These options are used to make the bibliography appear at the end of the endmatter or to be excluded. The default is for the bibliography to be included.

`multivolume` / `nomultivoume` — These options are used to specify that this thesis is meant to be split into multiple volumes. The first volume page, marking th start of the first volume, will be insereted automaticaly as part of the frontmatter. Each suceeding volume page must be inserted manually using the `\part` command.

`campanile` / `nocampanile` — These two options allow the user to turn on or off the campanile graphic used on the title page. The `campanile` option is selected by default, so the image appears by default. You should only have to turn this off if you have some issues with how you include graphics (the campanile option automatically loads the `graphics` package for it's use - the `graphicx` package is the preferred package to use for loading your own figures, and the two will coexist peacefully).

3 Required Packages

The following packages are required by this document class and are loaded as needed based on options given to the class. The packages required for using Times Roman fonts may not be present in all LaTeX installations, but they are freely available from any number of online TeXrepositories. (These packages are present in a FULL installation of Miktex 2.4 under Windows, but not the basic or lite installation).

calc A calculator package used in setting lengths and dimensions

makeidx Used if the index option is selected. This is part of any base LaTeX installation.

graphics Used for inserting the campanile graphic on the titlepage. It is recommended that the end-user uses the `graphicx` package for inputting their own figures and graphics. The `graphicx` package will not interfere with the operation of the `graphics` package

textcomp Used to provide the Times Roman font.

latexsym Used to provide the Times Roman font.

amsmath Used to provide the Times Roman font.

amsfonts Used to provide the Times Roman font.

amssymb Used to provide the Times Roman font.

txfonts Used to provide the Times Roman font.

4 Recommended Packages

The following packages are recommended for use in with this document class. See the `gtthesis-template.tex` file for an example.

hyperref This package creates hypereferences throughout the document that can be used to improve navigation in the final pdf form of the document. Specific modifications have been made to the `GTthesis` class to support the extensive changes that the `hyperref` package introduces. As a result, the `hyperref` package is considered compatible with this class. Since all theses and dissertations are now submitted electronically, this package is extremely useful and should be used.

graphicx The preferred and recommended way to get figures into your document is by using the `graphicx`. There are other ways to do it, but they are all deprecated in favor of this package. Note that the `graphicx` package supersedes the older `graphics` package which is used to load the campanile image. This newer package includes all the functionality of `graphics`, and can therefore be loaded on top of it. The reverse is not true, which is why the decision was made to use `graphics` to load the campanile instead of `graphicx.` But the `graphicx` package will be the most appropriate method to load figures for the vast majority of users.

insfig This is a package developed in conjunction with this document class and distributed with it. It attempts to simplify the inclusion of graphics by requiring only a single-line command to load a figure, or more importantly, many graphics that you want to place in a single figure as sub-figures in a

particular configuration. It requires the `graphicx` package and the `ifthen` package. For more details on usage, open the `insfig.sty` file and examine the header.

5 Other Packages

There are a huge number of LaTeX packages that have been developed to handle a myriad of issues associated with document creation. Some of those might conflict with the `GTthesis` class, causing features to break or changing the formatting to something not approved by OGS. If there is a package that is useful and popular and it conflicts with this class file, you can contact the current maintainer of this class and see if changes can be made to this class to overcome the incompatibilities. If you have a solution to resolve issues encountered with a package you use and feel that information might be helpful to future users of this class, please let the current maintainers know.

6 Preamble Commands

This section describes some commands that can be used in the preamble section of your main `.tex` file. See `gtthesis-template.tex` as an example.

`\setxxxstring` The following commands are used for setting the strings used to label sections and other items of the document. All of the commands or of the form `\setxxxstring {`⟨*Text*⟩`}`, where `xxx` is replaced by three letters as determined from Table 1. For example to make the title at the top of the table of contents page read Contents (instead of Table of Contents), you would simply issue the following in your preamble: `\settocstring{Contents}`. Note that correct capitalization is important for all of these labels.

Table 1: The table of string name abbrevitions for use in setxxxstring.

xxx	Section / Label	Default String
toc	Table of Contents	Table of Contents
lof	List of Figures	List of Figures
lot	List of Tables	List of Tables
bib	Bibliography	References
ind	Index	Index
epi	Epigraph	Epigraph
ded	Dedication	Dedication
abs	Abstract or Summary	Abstract
ack	Acknowledgement(s)	Acknowledgements
los	List of Symbols	List of Symbols
glo	Glossary	Glossary
chp	Chapter heading	Chapter
sec	Section heading	Section
app	Appendix Heading	Appendix
prt	Part heading (Volume)	Volume
fig	Figure name	Figure
tab	Table name	Table

`\setchaptertocdepth` This function sets the default depth to expand the table of contents under the

chapter headings. Default is to a value of 1, which will only show down to the sections in the table of contents. To change the value issue the following command in the preamble `\setchaptertocdepth{`n`}`. It $n = 0$, only chapter headings will be expanded; if $n = 1$ chapters+sections will be shown; and so forth. If the `proposal` option has been selected this command has no effect.

`\setsectiontocdepth` This macro is equivalent to the above `\setchaptertocdepth` but this is the value used when the `proposal` option has been selected. This is because `\section` becomes the top-level heading when the document is a proposal.

`\setappendixtocdepth` This macro is equivalent to the above `\setchaptertocdepth` or `\setsectiontocdepth` but for the appendices. The appropriate value for this command depends on whether the document is a proposal. If it is not a proposal, `\appendix` is at the same level (level 0) as `\chapter`. If it is a proposal, then `\appendix` is at the same level (level 1) as `\section`. The number should be set accordingly.

`\setfrontpagestyle` This macro accepts the standard page style names as a parameter and sets the default page style for the FrontMatter of the thesis / dissertation. The default pagestyle is plain. Available pagestyles include empty, plain, headings, myheadings, gtthesis.

`\setbodypagestyle` This macro accepts the standard page style names as a parameter and sets the default page style for the body of the thesis / dissertation. The default pagestyle is plain. Available pagestyles include empty, plain, haeadings, myheadings.

`\setendpagestyle` This macro accepts the standard page style names as a parameter and sets the default page style for the EndMatter of the thesis / dissertation. The default pagestyle is plain. Available pagestyles include empty, plain, haeadings, myheadings.

`\author` Used to give author's name. Usage: `\author {`⟨*Your Name*⟩`}`.

`\title` Used to give document title. DO NOT try to put line breaks in your title. If you want to do this use `\multiLineTitle` instead. Usage: `\title {`⟨*Your Thesis Title*⟩`}`.

`\multiLineTitle` Used to give document title, but allows the author to specify line breaks in the title. The downside is that this command requires the user to do explicit capitalization of the title (it should be all caps). Usage: `\multiLineTitle {`⟨*YOUR THESIS TITLE (with possible line breaks)*⟩`}`.

`\major` Used to change the major name to what you want it to be. The default is Electrical and Computer Engineering, which is the graduate degree from the ECE department. If this is not your major, then use this command. This appears on the title page after your degree type. Usage: `\major {`⟨*Your Major*⟩`}`.

`\dept` Used to change the department/school/college name to what you want it to be. The default is School of Electrical and Computer Engineering. If this is not your your department, then use this command. Usage: `\dept {`⟨*Your Department*⟩`}`.

`\copyrightyear` Used to specify copyright year. If you want the copyright info to appear you must ussue this command in the preamble. Usage: `\copyrightyear {`⟨*Publishing Year*⟩`}`.

`\graddate` Used to specify the month and year that the document's author will graduate (typically May, August, or December of the current year) . The format is ⟨*Month*⟩ ⟨*Year*⟩. If not included, the graduation date will default to the graduation month of the current semester (May, August, or December). Usage: `\graddate{`*Month YYYY*`}`. This appears on the title page.

`\approvaldate` Used to specify the date that the document was approved when doing an ETD. The format is ⟨*Month*⟩ ⟨*Day*⟩, ⟨*Year*⟩. If not included will default to current date. Usage: `\approvaldate{`*Month DD, YYYY*`}`. This will appear on the approval page.

`\addchair` Used to specify the name, title, and affiliation of the committee chair. The committee chair's name will appear in the list of signatures followed by the designation `Committee Chair` if there is room to fit it. If there is not room, this designation simply won't appear (I couldn't figure out a a good place to put it when it doesn't fit). Usage: `\addchair{`⟨*Name*⟩`}{`⟨*Title*⟩`}{`⟨*Affiliation*⟩`}`. Here is an example: `\addchair{Dr. Indiana Jones}{Asst. Professor, Ivan Allen College}{Georgia Institute of Techno`

`\addadvisor` Used to specify the name, title, and affiliation of the advisor. The advisor's name will appear in the signature list followed by the designation `Advisor` if there is room to fit it. If there is not room then it simply won't appear (I couldn't figure out a a good place to put it when it doesn't fit). Usage: `\addadvisor{`⟨*Name*⟩`}{`⟨*Title*⟩`}{`⟨*Affiliation*⟩`}`.

`\addadviser` This is the same as `\addadvisor` except that the word Advisor will now appear as Adviser (which is an allowed spelling). Usage: `\addadviser{`⟨*Name*⟩`}{`⟨*Title*⟩`}{`⟨*Affiliation*⟩`}`.

`\addreader` Used to add the name, title, and affiliation of a reader (committee member). Don't add more than six readers as you will break the code (Why in the world would anyone have more than six readers? I don't know.) Usage: `\addreader{`⟨*Name*⟩`}{`⟨*Title*⟩`}{`⟨*Affiliation*⟩`}`.

`\addepigraph` Used to quickly and easily add an epigraph, or theme quote, to the frontmatter of your document. You can use this command or, if you want or need more control over the formatting of the quote, you can use the epigraph environment within the frontmatter environment. Usage: `\addepigraph{`⟨*quote*⟩`}{`⟨*person being quoted*⟩`}`.

`\bibfiles` Used to specify the bibfiles to use for generating the bibliography. The `.bib` extension should not be inlcuded in the filename. Usage: `\bibfiles{`⟨*filename*⟩`}`.

7 General Document Commands and Environments

7.1 General Document Commands (Macros)

`\settocdepth` This command is used to change the toc display depth from the default depths defined in the commands `\setchaptertocdepth`, `\setsectiontocdepth`, and `\setappendixtocdepth`. When you begin one of these sections simply issue the `\settocdepth{`⟨*num*⟩`}` command to change from the default toc depth to what you want it to be - the setting only applies for that section.

`\comment` This command can be used to easily comment out large portions of your input file. Usage: `\comment{ All text inside brackets will disappear in the output }`

7.2 General Document Environments

`longquote` The `longquote` environment is the same as the quote environment except that the linespacing is forced to be single-spaced.

`longquotation` The `longquotation` environment is the same as the quotation environment except that the linespacing is forced to be single-spaced.

`newspacing` The `newspacing` environment is used to arbitrarily change the spacing of the text within the environment. It isn't recommended that you use this enviroment as the input value doesn't correspond as expected to producing the desired spacing. For example using `\begin{newspacing}{2}` ... Some Text ... `\end{newspacing}` will not double-space the text. It is better to use the `singlespace`, `oneandahalfspace`, and `doublespace` environments (see below).

`singlespace` This environment is used to set the spacing to be single-spaced for the text within the environment.

`oneandahalfspace` This environment is used to set the spacing to be one-and-a-half-spaced for the text within the environment.

`doublespace` This environment is used to set the spacing to be double-spaced for the text within the environment.

8 Frontmatter of the document

`FrontMatter` The FrontMatter environment (note capitalization) begins the front matter of the document. The command `\contents` should appear within the frontmatter environment, as well as any other environments that should fall under the frontmatter, such as abstract, dedication, acknowledgements, etc.

8.1 FrontMatter Commmands (Macros)

`\contents` This command takes no parameters and should appear before anything else in the FrontMatter environment. It will output the table of contents, list of figures, list of tables, list of symbols, and glossary (list of terms) in the order as required by OGS. It is appropriate to include these pages in a proposal as well, but if any page needs to be excluded one should use the preamble switches mentioned in Sec. **??**.

8.2 FrontMatter Environments

`abstract` This environment is appropriate for placing an abstract or summary. The heading for this section can be changed as described in Sec. 6.

`epigraph` This environment is used for placing a theme quote page immediately following the approval page. There is no heading for this page, but the name of the page as it appears in the pdf bookmarks list can be changed as described in Sec. 6. Note

that if you use the `\addepigraph` command in the preamble, this environment and it's contents will produce no output.

`dedication` This environment is appropriate for placing a dedication. The heading for this section can be changed as described in Sec. 6.

`acknowledgment` This environment is appropriate for placing a thanks and acknowledgments. The heading for this section can be changed as described in Sec. 6.

`preface` This environment is appropriate for placing a document preface (I'm not sure when this would be used) . The heading for this section can be changed as described in Sec. 6.

9 Body of the document

`Body` The Body environment (note capitalization) begins the main body of the document. All of the main headings and subheadings should appear within the body environment.

9.1 Body Commmands (Macros)

`\indexitem` Used to indicate a term is to be included in the index. Usage: `\indexitem{`⟨*term to index*⟩`}`. This command follows the typical LaTeX indexing formats as can be found in descriptions of the makeindex utility and the `makeidx` package.

`\gtglossaryitem` Used to indicate that this term should be included in the glossary (list of terms) of the document. Usage: `\gtglossaryitem{`⟨*term*⟩`}{`⟨*definition*⟩`}`. This should be used where the term is first introduced as the glossary will reference a page for the reader to go to.

`\gtlositem` Used to indicate that this symbol should be included in the list of symbols. This is very similar to the glossary (or list of terms) but the terms should now be symbols, such as the commonly used variables used in throughout the equations of the document. Usage: `\gtlositem{`⟨*symbol*⟩`}{`⟨*definition*⟩`}`.

If including an index, glossary, or list of symbols remember that the makeindex command needs to be used with the supplied glossary and list of symbols style files to create the actual glossary and list of symbols code which can be input to the document. The supplied batch file can be used to do this. Simply run `makeindexall.bat` <*Main tex filename (without .tex)*> after the first time LaTeX has been run. This is similar to how bibtex needs to be run after the first time LaTeX is run. It kind of stinks that things have to be done this way, but LaTeX isn't perfect. Hopefully the batch file will make things easier. The index, glossary, and list of symbols code has not been extensively tested,so it may yet have issues. There is a package called `nomenclature` which some of my code is based off of, that might be used if this class's code doesn't work. Please report bugs to the class maintainer.

10 Endmatter of the document

`EndMatter` The EndMatter environment (note capitalization) begins the endmatter of the document. All of the appendices should appear in this environment. The

`\references` command should also be called from within the EndMatter environment. The Vita environment, if included, should also appear inside the EndMatter environment.

10.1 EndMatter Commmands (Macros)

`\references` This macro must be used to generate the bibliography page at the end of the document. It should be called after all of the appendices have concluded. Usage: `\references`

`\appendix` This command does not take its usual role in this thesis template. The appendix command is used just like `\chapter` or `\section` would be used in the main body of the document. This command should only be used within the `EndMatter` environment. When the document is a proposal, `\appendix` is of the same level as `\section`, and all subsection commands should reflect that. When not a proposal, the `\appendix` command is of the same level as the `\chapter`.

`\index` This command is used to place the index within the document. This should be the last command of the EndMatter environment if it is being used. You must remember to process the index file using the external `makeindex` utility just as you need to for the glossary and list of symbols. The same batch file can be used to process all three together.

10.2 EndMatter Environments

`vita` The vita environment is used to place a C.V. at the end of yoour document.