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Requirements for Thesis and Presentation

The final academic requirement for all students seeking a PhD or Engineer's degree is preparing and "defending" a document termed a thesis or dissertation, that summarizes the work done by the candidate. The thesis must be approved by the examination committee, the Division Chair, and finally by the Dean of Graduate Studies.

The thesis is a document prepared by the candidate and represents an exposition of the candidate's research topic and findings. There are specific requirements for format as well as the process of thesis acceptance, but the content and length are flexible and vary substantially between individual candidates. The expectation by the faculty and the Dean of Graduate Studies is that the thesis should represent independent work by the candidate and meet the highest standards of scholarship as well as written expression. The Dean relies on the candidate, the advisor, and thesis committee to uphold these standards.

The defense usually consists of a public presentation and a private final examination with the members of the examining committee. The public presentation is in the form of a seminar whose audience includes the members of the examining committee. It is the candidate's responsibility to make all the arrangements for the seminar and final exam. Each thesis must be submitted to the Graduate Office for proofreading a minimum of two weeks before the scheduled defense. In order to complete the PhD requirements, the student must not only pass the oral thesis defense, but also submit a final, approved thesis to the Library's CaltechTHESIS database (<http://thesis.library.caltech.edu>) in an acceptable format in order to be eligible for the degree to be conferred at Commencement, which takes place once each year in June.

The formal requirement for a written thesis and oral defense is set out in the Caltech Catalog (<http://catalog.caltech.edu>) in Section 4 under the General Requirements for Graduate Degrees, Degree of Doctor of Philosophy. The requirements also apply to Engineer's degree candidates.

"The Ph.D. degree is conferred by the Institute primarily in recognition of breadth of scholarship, depth of research, and power to investigate problems independently and efficiently, rather than for the completion of coursework. The work for the degree consists of research and systematic studies that advance knowledge. In addition, the candidate must have acquired the power of clear and forceful self-expression in both oral and written English. The candidate must then describe their work in a thesis and defend it in an oral examination by the faculty."

Special Requirements

In addition to the general requirements of the Graduate Studies Office, there may be special requirements that will vary from option to option, particularly in terms of the number of copies needed for the examining committee, and additional final copies beyond the electronic copy submitted to the Library's CaltechTHESIS database. Candidates should consult with their Option Administrator for information concerning these additional requirements.

Content of Thesis

A thesis may be organized as a single paper or as a series of relatively independent chapters unified by an introductory summary (representing Chapter 1 of the thesis). The chapters may be papers that have been or will be submitted to journals in the field. If you are not the only or first author on an included paper, you must establish your major new contribution to the field in an introductory summary describing the “theme of the thesis”. Candidates should work collaboratively with their advisors and thesis committees in determining the appropriate content and depth of presentation that is expected for an acceptable thesis.

If you are including pre-published content as part of your thesis, you must include the citation and Digital Object Identifier (DOI) for the published version in the Contributions section of the thesis and also describe your role with each article and its contents. This information should be added as part of the Contributions page in the prefatory section of the thesis.

If you are including individual chapters that represent a work accepted for publication but not yet in print, it is important to specify the citation to the publisher’s version and the DOI in a footnote at the bottom of the chapter’s first page.

Copyright Considerations

The author is the copyright owner for the overall thesis document, as indicated on the Copyright page included as Page ii. However, individual chapters or included third party materials retain their own copyright status, and authors need to be sure they have authorization to include these materials in the thesis.

The library’s web page on [Author Services](#) also provides useful information to consider when thinking about retaining your author rights during the article submission process. Many publishers do not require permission for students who want to use content from their own articles for inclusion in the thesis and the library provides a list of these publishers at <http://libguides.caltech.edu/publisherpolicies>.

If you have any questions or concerns about copyright or intellectual property in your thesis, contact the Library at thesis@library.caltech.edu and/or the Caltech Office of the General Counsel (<https://www.ogc.caltech.edu>)

Procedures and Deadlines

It is the candidate’s responsibility to follow the appropriate process in writing and having the thesis accepted by the faculty, completing the appropriate forms in a timely manner, and securing the appropriate approvals. Key steps in this process are outlined below.

Before Writing the Thesis

Familiarize yourself with the Institute’s thesis regulations before beginning to write your thesis. Additionally, you may find explanatory and instructional resources about thesis preparation, submission, and dissemination from the Library’s online guide “Caltech Regulations for the Format and Presentation of a Graduate Thesis”: (<http://libguides.caltech.edu/theses>). We strongly urge all candidates to use the electronic thesis formats (Word or LaTeX) available through the Library website, and to review previously deposited theses in CaltechTHESIS for examples.

Following these formats will ensure that the appearance of the thesis will conform to the Institute requirements and minimize the time required for acceptance by the proofreader and CaltechTHESIS.

The Examining Committee

The Institute requirements state that an examining committee must consist of a minimum of four members, three of whom must be Caltech professorial faculty. The chair of the committee must be a Caltech professorial faculty distinct from the student's advisor. The candidate and thesis advisor should work collaboratively to select a thesis examining committee if one was not established at the time of the advancement to candidacy.

Scheduling the Examination

No later than two weeks before your scheduled exam date, complete the Ph.D. Examination tab in REGIS – Graduate Degree Progress. You will need to submit your examination committee for approval by the Option Representative and the Dean of Graduate Studies and complete the examination details (date, time and location of the exam). In addition, you are asked to provide the name you wish to appear on the diploma, the full thesis title, and whether or not you plan to participate in the commencement ceremony.

Also at this time you are required to email a complete draft of your thesis to the Graduate Studies Office (gradofc@caltech.edu) for proofreading.

Before your examination, the proofread copy of the thesis will be returned to you via email. Each member of your committee will be able to post the result of your exam and thesis submission on or after your examination date. If you have a subject minor, you must complete the [Minor Candidacy](#) form and obtain the minor option representative's signature. The minor will appear on the diploma and in the commencement program following the major field of study.

Proofreading

All manuscripts must be proofread before the final thesis exam. The consistency and accuracy of the spelling, punctuation, capitalization, abbreviations and word divisions are the responsibility of the thesis writer. Students are urged to proofread the manuscript carefully, or to enlist the help of a friend or professional proofreader.

The Graduate Studies Office provides proofreading services at no cost to the student. Draft theses should be emailed to the Graduate Studies Office at least two weeks before the final exam is scheduled.

An electronic copy of the thesis is required, and must be in PDF format. If the file is sufficiently small, this can be emailed directly to gradofc@caltech.edu; large files should be transferred through the Caltech Dropbox (<https://dropbox.caltech.edu/cgi-bin/dropbox.cgi>). Please note that the Dropbox access is valid for 24 hours, so if you submit the thesis after business hours on a Friday, it is likely you may have to resend the thesis when the office reopens on Monday.

The Institute proofreader will return to the student for correction and resubmission any thesis that has been carelessly formatted or filled with grammatical or typographical errors. The expectation is that a candidate will work with their advisor and committee to meet both the highest standards in scholarship and of presentation and style.

Before the Final Exam

It is the candidate's responsibility to arrange for a convenient date and time for all examining committee members to attend the final thesis exam, and to make the necessary room reservations. The candidate must distribute a draft of the thesis to the committee members, as well as the Graduate Studies Office, for proofreading prior to the examination. The draft should be distributed to the committee at least two weeks in advance of the exam.

After the Final Thesis Exam

a. Revisions to the Thesis

The thesis should be prepared in accordance with Institute regulations and must be complete and accompanied by all illustrative and supplementary material. Rewriting and changes may be necessary if the specifications are not met. The degree will not be officially awarded and certification of degree completion will not be provided until all steps have been completed and the thesis is submitted in satisfactory form and approved by the Dean of Graduate Studies.

Revisions required by the committee and proofreader must be approved by the committee or its designee. Theses requiring revisions will be noted in the results section in REGIS and once the revisions have been satisfactorily completed, the result will be updated to "Approved" in REGIS.

b. Submission to the Library

The final, corrected thesis, must be uploaded to CaltechTHESIS (<http://thesis.library.caltech.edu>) no later than June 1 of the year in which the degree is to be conferred. Continued enrollment is not permitted for the term following the PhD defense, unless an approved petition for continuing enrollment has been submitted and approved by the Dean of Graduate Studies. Continuing enrollment is limited to one term if the defense took place in the previous summer, fall, or winter terms. Please note that once the degree has been conferred in June, enrollment as a graduate student is not permitted under any circumstances. Students wishing to remain on campus must be appointed to another Institute status (post-doc, staff, etc.) or delay conferral of the degree if final requirements have not been met before June 1. Check with the Graduate Studies Office if a short extension is needed.

The electronic copy of the final thesis text must be deposited in PDF format to CaltechTHESIS for public dissemination and long-term archiving. Supplementary material can be accepted in different electronic formats. The library will assign a DOI to the thesis.

Thesis authors may elect to delay release of the thesis to the public or restrict its access to campus only for a period of time, usually one to two years. If the restriction will last longer than two years, the Library will need approval from the author's advisor and/or committee chair for the extended time. Access restriction can be extended upon request by the author and/or advisor.

Theses restricted to campus are automatically released for public views when the access restriction expiration date is reached. Theses that are fully or partially embargoed are not released until authorization has been received by the author and/or advisor.

c. ProQuest UMI Dissertation Publishing and Microfilming Agreement (Optional as of 2016)

ProQuest/UMI is a corporation in Ann Arbor, Michigan that maintains an archive of about 1.5 million dissertations, as well as an online service called Dissertation & Theses. If you choose to also submit your thesis to this company, the Library will send a final copy to ProQuest only after your thesis is publicly released. Theses that are fully or partially restricted to campus or embargoed will not be sent until they have been released for public view.

d. Survey of Earned Doctorates

The Survey of Earned Doctorates is sponsored by the National Science Foundation and five other Federal agencies and conducted by NORC. The SED is critical to understanding in what specialty areas doctorates are produced and their post-graduation employment plans. Results are used by government as well as academic institutions to make decisions about graduate education funding, developing new programs and supporting existing programs. Surveys can be completed online at <https://sed.norc.org/showRegister.do>.

Preparing and Formatting Your Thesis

Templates

The Library has a comprehensive list of templates that conform to Caltech's thesis guidelines for formatting. The templates (LaTeX2e, Word, etc.) can be found on the Institute's library website at <http://libguides.caltech.edu/theses>. We strongly urge all candidates to use these formats. Do not invent your own, use bizarre typefaces, nonstandard page sizes, or weird formatting conventions; these will not be accepted and will delay the approval of thesis.

Reproduction

The following important reminders should be observed in all cases so that the best reproduction quality can be achieved.

- The final text should be submitted in PDF format.
- Embedded fonts, which should be either TrueType or Type 1, are required for the PDF.
- All text should be double-spaced, but long quotations and footnotes may be single-spaced.
- The font size should be 11 or 12 point.

Margins

Left margin	-	1½ inches
Right margin	-	1 inch
Top and bottom	-	1 inch

Although not required, the student may also provide a PDF of the thesis that is meant to be printed double-side. In this case, the right margins should also be 1½ inches.

The same width margins must also be allowed on pages containing graphs, tables, and other illustrative materials. These regulations must be followed so the Institute Library may bind a final copy for reference use.

Pagination

All pages except the title page must be numbered at least 3/4" from the top of the page. Use small Roman numerals for all preliminary pages. Begin the numbering with a small Roman numeral ii on the top of the page following the title page. Use Arabic numerals beginning with the Introduction or Chapter I of the main text of the thesis, and continue with every page that follows, whether it be text, figures, explanation for figures or photos, tables, maps, appendices, etc., numbering pages to the end. Page numbers must be within the margins at the top of each page. However, each chapter may be numbered separately, using consecutive capital letters or Roman numerals to distinguish the individual chapters throughout the thesis (i.e. A-1..., I-1...).

Page Order

Paginate the parts of the thesis in the following order:

Sequential small Roman numerals (at the top of the page within margins):

- | | |
|---|----------------|
| 1. Title page | (not numbered) |
| 2. Copyright page | ii |
| 3. Acknowledgment | iii |
| 4. Abstract | iv |
| 5. Published Content | v |
| 6. Table of Contents | vi |
| 7. List of illustrations and/or list of tables, and nomenclature
if applicable (<i>Oversized items noted in parentheses</i>) | vii |

Sequential Arabic numerals (at top of page within margins):

- | | |
|---|---|
| 8. Main text of thesis, including any Introduction or Summary. | 1 |
| 9. Material to follow text, such as references, appendices, fold-in maps and other supplementary material. Such material may be included at the end of each chapter, making each chapter a complete and self-contained paper with its own pagination. | |

Acknowledgements

If you do not wish to add any acknowledgements to your thesis, you may simply add a blank titled Acknowledgements page.

Abstract

An abstract of the thesis will be used by researchers via search engines to determine whether they wish to access your complete dissertation. Therefore, this abstract must provide a succinct and informative condensation of your work. Candidates are welcome to prepare a lengthier abstract for inclusion in the dissertation, and provide a shorter one in the CaltechTHESIS record.

Please follow these guidelines for preparing your abstract.

- Avoid abbreviations and acronyms.
- Do not include graphs, charts, tables or illustrations.

Published Content

Include a bibliography of published articles or other material that are included as part of the thesis. Describe your role with each article and its contents. Citations must include DOIs or publisher URLs if available electronically.

Summary Introduction

If the thesis consists of relative independent chapters, a unifying summary should be included at the end or beginning of the thesis. Such a summary will generally be quite different in style and length than the abstract.

References

The precise form of a bibliography or reference section can conform to the style current in the thesis writer's discipline, but this form must be used consistently throughout the thesis. (Allowance will, of course, be made for any material already published and included in the thesis or for individual sections intended for publication in a particular journal.) Similar materials should be presented symmetrically; entries for the same type of material should have the same publication facts, order of items, and punctuation. For helpful guides to the systems of documentation established in various fields, the student should consult one or more style guides located in the Library.

Supplementary Material

a. Charts, Graphs, Tables, Photographs, and Oversized Maps

Charts, graphs, and maps that are larger than the standard 8 1/2" x 11" page size may be used in your manuscripts. Please identify these oversized items in the Table of Content using parentheses (e.g., "Oversized")

b. Supplemental Electronic Material

It is strongly recommended that supplemental research outputs accompanying your thesis (such as extensive data sets, video files, computer software, detailed experimental procedures, data tables, algorithms, etc.) be submitted in electronic format to the Library to ensure long-term dissemination and archiving. If any of the submitted files will be greater than 2 Gb, contact the library in advance to discuss options.

Research outputs associated with this thesis may be handled in one of two ways:

- Placed in appendices accompanying the submission at the end of individual chapters or at the end of the thesis. In this case, you include the supplementary files along with the thesis document as part of the electronic submission process;
- Deposited separately as distinct research objects to the Library's data repository for improved discoverability, long term archiving, and wider dissemination. The Library assigns to each unpublished research contribution a unique DOI so that it can be persistently linked to the thesis document and properly cited by subsequent re-users. Students interested in depositing items to the Library's data repository may learn about this option by sending an inquiry email to thesis@library.caltech.edu. The supplementary files need to be deposited to the data repository in advance of theses completion so that the appropriate citations and links to the supplementary files are included in the thesis proper.

c. Original Source Files

The Library collects, as part of the CaltechTHESIS record, all original source files, including the original thesis in pre-PDF format. These are stored as permanently embargoed archival material. Students are strongly encouraged to upload these files as part of their CaltechTHESIS submission process.

d. Copyright Permissions

Save electronic copies (txt or PDF format) of any use permissions received from copyright holders for copyrighted material included in the thesis. Upload them as embargoed files in the CaltechTHESIS record.

Additional Resources for Caltech Thesis Authors

The Caltech Library has a comprehensive website section on several topics of interest to thesis authors (<http://libguides.caltech.edu/theses>):

- LaTeX2e style files
- Word templates
- Deadlines and timelines
- Updates or corrections

- Caltech Graduate Office regulations
- Printing and binding services
- Copyright, Fair Use, and Getting Permission
- Publishers' thesis policies
- ProQuest/UMI Dissertation Publishing and Microfilming

The Library also provides specialized but related services that may be of interest to students throughout their career at Caltech:

Create DOIs using EZID

Provided through the Caltech Library by the California Digital Library, EZID enables researchers to generate persistent identifiers (DOI and ARK) for publications, data, web pages, etc., and allows users to associate unique DOIs for unpublished material, including supplemental material. Contact the Library if you have questions or would like to set up an account to use this service. (<http://libguides.caltech.edu/EZID>)

Create a Standard Unique Author Identifier using ORCID

A standard, internationally-adopted unique author identifier that distinguishes you from every other researcher and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between you and your professional activities ensuring that your work is recognized. Contact the library if you have questions or would like to set up an account to use this service. <http://libguides.caltech.edu/orcid>

Appendix A - Sample Title Page

The year shown should be the year in which the degree is granted at Commencement. This may be the following calendar year, depending on when the student has completed his degree requirements. The date in parentheses on the next line is the date of the thesis examination.

FULL THESIS TITLE

Thesis by

Your Full Name

In Partial Fulfillment of the Requirements

for the Degree of

Doctor of Philosophy

California Institute of Technology

Pasadena, California

Year Degree Conferred

(Defense Date)

Appendix C - Common Proofreader Marks

Proofreaders' Marks

↵	Delete	⌋	Move right
⌒	Close up	⌈	Move up
↵⌒	Delete and close up	⌋	Move down
↔	Transpose	≡	Align horizontally
#	Insert space		Align vertically
sq.#	Equalize space	↵	Insert comma
¶	Start new paragraph	⊙	Insert period
no ¶	Run existing paragraphs together	:/	Insert colon
Ⓢ	Spell out	;/	Insert semicolon
STET	Let it stand	?	Insert question mark
cap	Change to capital letter(s)	∩	Insert apostrophe
lc	Change to lowercase letter(s)	↵↵	Insert single quotation marks
ital	Change to <i>italic</i> type	ⓈⓈ	Insert quotation marks
rom	Change to roman type	⌠ ⌡	Insert parentheses
bf	Change to boldface type	⌈ ⌋	Insert brackets
⌈	Move left	=	Insert hyphen