



PennState
The Graduate School

THESIS and DISSERTATION GUIDE

Requirements and Guidelines for the Preparation of Master's Theses and Doctoral Dissertations

[Office of Theses and Dissertations](#)

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University Park, PA 16802

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<http://www.gradschool.psu.edu/current-students/etd/>

INTRODUCTION

The primary purpose of a thesis or dissertation is to train the student in the processes of scholarly research and writing under the direction of members of the Graduate Faculty. After the student has graduated and the work is published, it serves as a contribution to human knowledge, useful to other scholars and perhaps even to a more general audience.

Therefore, the Graduate School, the University Libraries, and the Graduate Faculty of Penn State have established format standards that theses and dissertations must meet before receiving final approval as fulfillment of graduate requirements. This publication sets forth those standards. Some of these requirements are purely technical; others have been established to ensure that certain vital information is presented in an orderly, uniform manner.

The requirements in this publication apply to all Penn State theses and dissertations. They are, however, designed to allow for maximum flexibility in minor matters, which vary among academic disciplines. Thus, while you will need to comply with the specifications given here, you will probably also need to consult a specialized manual of scholarly style in your field or the style sheet of a leading journal.

Be careful if using another thesis/dissertation as model for your own; remember that this guide is revised from time to time, and you must meet **current** requirements. You have a fair amount of discretion with regard to style, but you must be consistent in format throughout. The work should be written in clear, grammatically correct English, with words spelled and divided correctly and punctuation standard and appropriate.

The Role of the Office of Theses and Dissertations

The Office of Theses and Dissertations (a division of Graduate Enrollment Services) is the branch of the Graduate School responsible for certifying that theses and dissertations have been prepared in accordance with the regulations in this guide. When a thesis/dissertation is submitted to the Office of Theses and Dissertations, it must meet the requirements set forth here. The text should be proofread and free of grammatical errors and typos. However, the Office of Theses and Dissertations reviews the document for format and compliance to Graduate School requirements only.

Responsibility for the Thesis/Dissertation

The author bears ultimate responsibility for meeting all of the Graduate School requirements. He or she must pay the thesis fee, apply to graduate, meet deadlines for review and final submission, and obtain faculty signatures. The best advice is to start early and make certain that the requirements outlined in this guide are fully met.

It is extremely important that the author carefully review and proofread the thesis or dissertation before final submission. After final approval by the Office of Theses and Dissertations, changes are **not** permitted.

SUBMISSION AND REQUIREMENTS

Electronic Submission

Electronic submission of the final dissertation (eTD) became a requirement for all doctoral candidates at Penn State starting in fall semester 2006 and for master's candidates in fall semester 2008. Both the format review and final copy must now be submitted online. For information on eTD preparation and submission, go to <http://www.gradschool.psu.edu/current-students/etd/>.

The author, when submitting an eTD, must choose one of three options for release of the document. **Option 1** is open access (release of the entire work for access worldwide). **Option 2** is access by those with Penn State Access IDs only for a period of two years (not to be used for theses containing patentable information). **Option 3** is complete restriction for a period of two years for **patent and/or proprietary purposes only**. This option requires that the author file an invention disclosure form with the Office of Technology Management before submission of the final thesis.

With Options 2 and 3, the work will be released automatically for access worldwide at the end of the two-year period unless a written request is made for a one-year extension. This request must be submitted to the Office of Theses and Dissertations by the author at least 30 days prior to the end of the restriction. For additional information on these options, visit the eTD website.

The “official” copy of an eTD is the electronic file, and this is the copy that will be on file with University Libraries. Keep in mind that electronic submission does not prevent the author from producing hard copies for the committee, department, or for personal use.

The eTD is available to anyone who wishes to access it on the Web (unless the author chooses one of the options that will restrict availability for two years). This open access distribution makes the work more widely available than a bound copy on a library shelf.

IMPORTANT NOTICE:

**ALL THESES AND DISSERTATIONS MUST BE
SUBMITTED IN ELECTRONIC FORMAT (PDF FILE ONLY)**

How to Submit a Doctoral Dissertation

- ❑ Become familiar with the format requirements by reading the Thesis and Dissertation Guide carefully (<http://www.gradschool.psu.edu/current-students/etd/thesisdissertationguidepdf/>).
- ❑ Apply to graduate on LionPATH during the semester in which you plan to graduate. Go to <http://www.registrar.psu.edu/graduation/intent.cfm> for instructions. Go to <http://www.gradschool.psu.edu/current-students/etd/thesisdissertationperformance-calendar/> for deadline.
- ❑ Upload a draft of your dissertation for format review (pdf only) to the eTD website (<http://etda.libraries.psu.edu/>) by the specified deadline. Corrections and detailed instructions will be returned to you by email within two weeks.
- ❑ Defend the dissertation and make any changes required by the committee. This can be done either before or after the format review, as long as deadlines are met. Receive approval from the committee in the form of signatures on the Doctoral Signatory Page.
- ❑ Review the dissertation one final time to be sure that no further changes are needed. It will not be possible to make corrections after final approval by the Office of Theses and Dissertations. Convert the file into a pdf for eTD submission. If you cannot do this, contact the Office of Theses and Dissertations for assistance.
- ❑ Go to the eTD website (<http://etda.libraries.psu.edu/>) and upload the final eTD; submit supporting materials to the Office of Theses and Dissertations, (Note: It doesn't matter if you upload first or submit the materials first). Supporting materials are: signed Doctoral Signatory Page, ProQuest/UMI Agreement, Survey of Earned Doctorates, and \$95 fee. The fee can be paid at <https://secure.gradsch.psu.edu/paymentportal/>.
- ❑ Await notification of eTD approval by email. If changes are required, you will be notified. Your eTD will be accessible on the eTD website immediately after graduation, unless you have chosen restricted access.

If bound copies are needed, contact any Multimedia & Print Center on campus (<http://www.multimediaprint.psu.edu/>) or you may use an off-campus source. All copies are the author's responsibility. The Graduate School does not provide copies.

How to Submit a Master's Thesis

- ❑ Become familiar with the format requirements by reading the Thesis and Dissertation Guide carefully (<http://www.gradschool.psu.edu/current-students/etd/thesisdissertationguidepdf/>).
- ❑ Apply to graduate on LionPATH during the semester in which you plan to graduate. Go to <http://www.registrar.psu.edu/graduation/intent.cfm> for instructions. Go to <http://www.gradschool.psu.edu/current-students/etd/thesisdissertationperformance-calendar/> for deadline.
- ❑ Upload a draft of your thesis for format review (pdf only) to the eTD website (<http://etda.libraries.psu.edu/>) by the specified deadline. Corrections and detailed instructions will be returned to you by email within two weeks.
- ❑ Make any changes required by adviser and readers. Receive approval in the form of signatures on the Master's Signatory Page.
- ❑ Review the thesis one final time to be sure that no further changes are needed. It will not be possible to make corrections after final approval by the Office of Theses and Dissertations. Convert the file to a pdf for eTD submission. If you cannot do this, contact the Office of Theses and Dissertations for assistance.
- ❑ Go to the eTD website (<http://etda.libraries.psu.edu/>) and upload the final eTD. Submit supporting materials to the Office of Theses and Dissertations (Note: It doesn't matter if you upload first or submit the materials first). Supporting materials are: signed Master's Signatory Page and \$25 fee. The fee can be paid at <https://secure.gradsch.psu.edu/paymentportal/>.
- ❑ Await notification of thesis approval by email. If changes are required, you will be notified. Your eTD will be accessible on the eTD website immediately after graduation unless you have chosen restricted access.

If bound copies are needed, contact any Multimedia & Print Center on campus (<http://www.multimediaprint.psu.edu/>) or you may use an off-campus source. All copies are the author's responsibility. The Graduate School does not provide copies.

Deadlines and Format Review

Every thesis and dissertation at Penn State must be reviewed and approved by the Office of Theses and Dissertations (a division of Graduate Enrollment Services). There are no exceptions. However, master's papers and projects are **not** reviewed by the Office of Theses and Dissertations. If you are unsure of the requirements for your degree, please check with your department.

Thesis/dissertation deadlines (calendar) for each semester can be found on the Graduate School website at <http://www.gradschool.psu.edu/current-students/etd/thesisdissertationperformance-calendar/>.

It is the responsibility of the thesis/dissertation author to be aware of and to meet deadlines for submission. **Failure to meet the specified deadlines will result in the removal of your name from the graduation list.** It is not necessary to submit for format review a second time if graduation is postponed to a later semester.

The length of time required for review of the thesis or dissertation varies according to the number of documents awaiting review at any given time. If you submit early in the semester, you will most likely get it back in less than a week. If you wait until the final deadline, it may take longer. In either case, you will be notified by email when the review is completed.

Apply to Graduate

You must apply to graduate on LionPATH during the semester in which you plan to graduate. Go to <http://www.registrar.psu.edu/graduation/intent.cfm>. This will put your name on the graduation list so that a diploma is printed for you, etc. If you fail to meet the thesis/dissertation deadlines, you will be removed from the graduation list. You must reapply to graduate if you decide to graduate the next semester.

Fees

A processing fee is assessed by the Graduate School for every thesis and dissertation. In the case of a master's thesis, the fee is \$25; the fee for a doctoral dissertation is \$95. Thesis/dissertation fees are paid at <https://secure.gradsch.psu.edu/paymentportal/>.

Signatory Page

A signed signatory page with the original signatures needs to be submitted to the Office of Theses and Dissertations at 115 Kern, University Park, PA 16802 and is retained by the Graduate School (see examples in Appendix A). The signatures on the signatory page indicate that the thesis/dissertation is approved as a complete and final work requiring no further alteration. This page is required for approval of the thesis/dissertation by the Office of Theses and Dissertations.

In addition to the committee members, the signatory page must be signed by either the program head or program chair of the student's major program. Do not list the same person more than once on the signatory page. If the sharing of roles leaves you with less than the required number of signatures, an additional member must be added.

A minimum of three signatures is required for a **master's** thesis, and must be signed by the

thesis adviser and/or committee members and the program head or program chair. For a **doctoral** dissertation, at least two-thirds of the committee, as well as the program head or program chair must sign. The program head or program chair must sign, even if he/she is not a member of the committee.

If a signatory is not available to sign at the appropriate time, a **proxy signature** is allowed so that the thesis/dissertation will qualify for final submission. The program head may sign the name of the absent signatory and initial, thus indicating knowledge of the approval. No specific color of ink is required for signatures.

Consult the Office of Theses and Dissertations staff if you have any concerns about the signatory page or if you need clarification of the regulations stated above.

Final Submission, Approval, and Letter of Certification

When the final thesis/dissertation is uploaded, it is examined once more to make certain that the required revisions have been made and all the pages are present. If everything is in order, the document will be approved and the author will be notified of the approval.

The eTD will be available online immediately after the degree conferral date (unless restriction is requested). **Without exception, changes cannot be made to the thesis or dissertation after approval by the Office of Theses and Dissertations, so it is important to proofread carefully before final submission.**

If you require documentation stating that you have met the requirements for the degree before graduation, you may request a letter of certification at Graduate Enrollment Services in 114 Kern Graduate Building (814/865-1795). You should apply for this letter at least two weeks before you need it. The letter will be provided only after approval of your final thesis/dissertation.

<http://www.gradschool.psu.edu/faculty-and-staff/forms/ges/>

TECHNICAL REQUIREMENTS

Type Specifications

Most important in typing a thesis or dissertation is consistency of format and adherence to the specific instructions given in this guide. The text of an eTD may be single-, double- or one-and-a-half-spaced.

Use a standard typeface of 10-, 11-, or 12-point size. Limit the use of italic (script) print to foreign words, book and journal titles, and special emphasis. If you wish, you may use larger size type for the title of the thesis and for chapter headings, as long as it is not larger than 18-point. Boldface type may also be used on the title page and for headings, as well as in the text, for special symbols or for emphasis.

Reduced type may be used within tables, figures, and appendices, but, in part because of micro-filming requirements, it should be at least 9-point in size and must be completely legible. It is permissible to use color in the document, but keep in mind that the microfilm version will show black-and-white only.

Begin each chapter on a new page. Do the same with each element of the front matter (list of tables, acknowledgments, etc.), the reference section, and each appendix. Try to avoid typing a heading near the bottom of a page unless there is room for at least two lines of text following the heading. Instead, you should simply leave a little extra space on that page and begin the heading on the next page. If you wish to use a “display” page (a page that shows only the chapter title) at the beginning of chapters or appendices, be sure to do so consistently and to count the display page when numbering the pages.

Margins

A .75” or 1” margin on all sides is acceptable, but keep in mind that a wider left margin (e.g., 1.5”) may be more appropriate for binding purposes.

Page Numbers

Every page in the document, including those with tables and figures, must be counted. Use lower case Roman numerals for the front matter and Arabic numbers for the text. **The text (or body) of the thesis/dissertation must begin on page 1.** Do not number a page with “a” or “b” or skip numbers; do not embellish page numbers with punctuation (dashes, periods, etc.); and do not type the word “page” before the page number. Running headers are not permitted.

A one-page vita is required as the last page of a doctoral dissertation, and this page should not be numbered (it is not required for a master’s thesis). The title page does not show a page number, although it is actually page i. The committee page is page ii, and the Abstract begins page iii.

Page numbers may be placed in the upper right-hand corner, lower right-hand corner, or centered at the top or bottom of the page. Page numbers should not be placed on the left side of the page. Allow a reasonable distance between the page number and any text; in no instance may the page number overlap the text.

The Master's Signatory Page and the Doctoral Signatory Page are not included in the actual thesis or dissertation. Instead, they are kept on file in the Office of Theses and Dissertation. The committee page, however, will list the names and titles of all who signed off on the eTD.

Help with Word Processing

Information Technology Services (ITS) offers a variety of services targeted to thesis/dissertation authors. PsuThesi and PSTT (Penn State Thesis Template) are programs that have been designed to conform to the Office of Theses and Dissertations guidelines. They contain styles, macros, toolbars, and menus to facilitate the thesis/dissertation writing process and include layouts for Penn State doctoral dissertations and master's theses and University Scholar's papers. Consult <http://www.bit.ly/psuthesistemplate> or ITS staff for additional information.

Documentation of Sources in the Text

Source citations are required in the text whenever you use a direct quotation, paraphrase another author's words, or include specific information that is not common knowledge (and is not the result of your own research reported in the thesis/dissertation). Systems of source citation fall generally into three categories: (1) parenthetical author-date-page documentation; (2) citation by number, keyed to a numbered reference list; and (3) footnotes or endnotes. Select one of these systems and use it throughout the thesis/dissertation. A thesis/dissertation using one of the first two systems could also include footnotes presenting non-source information or comments.

References in the text must correspond exactly to the listing of sources at the end of the thesis/dissertation. Be certain that all items are included in the bibliography or reference list, authors' names are spelled consistently and correctly, and dates are the same in both the text and the reference list.

FRONT MATTER

The term "front matter" refers to all the pages in front of the main text of the thesis/dissertation. Front matter pages are numbered with lower case Roman numerals. These pages are:

- title page (unnumbered)
- committee page (page ii)
- abstract (begins on page iii)
- table of contents
- lists of figures, abbreviations, maps, tables or multimedia items (each a separate list)
- preface (optional)
- acknowledgments (optional)
- epigraph, frontispiece, or dedication (optional; do not include in Table of Contents)

The abstract is required in all theses/dissertations and begins on page iii. The table of contents is also required. Acknowledgments are optional and should be at the end of the front matter unless an epigraph, frontispiece, or dedication is added. An introduction may be chapter 1 or it

may precede chapter 1, but it must be numbered as part of the text, not as part of the front matter.

Title Page

The title page must appear **exactly** as shown in the example in Appendix A of this guide. Type the title of the thesis/dissertation using capital letters throughout. If it occupies more than one line, double space between lines. Use word substitutes for formulas, symbols, superscripts, Greek letters, and other non-alphabetical symbols in the title of the thesis/dissertation.

Master's candidates should use "Thesis," and doctoral candidates should use "Dissertation" on the title page. Use your legal name as it appears on your student record in the Registrar's Office. Your name must appear in exactly the same form each time it is used in the thesis/dissertation. On the copyright line, use the word "Copyright" or the symbol © (not both), followed by the year and your name. (Note: You own the copyright on your work whether you choose to include this notice or not.)

On the date line, indicate the month and year of degree conferral, **not** the date of the defense or the date you submit your thesis/dissertation. Degrees are conferred only in May, August, and December.

Committee Page

The final copy of the thesis or dissertation must include a committee page that lists the names and titles of those faculty members who have approved the work; this should not contain the signatures of the committee members. The names on this page must match exactly those on the signatory page. The committee page is page ii and appears immediately before the Abstract.

Do not list the same person more than once on the committee page. If one of the signatories has a dual role, list both roles under the professorial title.

The adviser must be designated on the committee page, if signing the signatory page. If two or more individuals served as advisers, list each as "Dissertation Co-Adviser." The chair must be designated on the committee page, if signing the signatory page. If there is more than one committee chair, list each as "Co-Chair of Committee." There should be no chair indicated on a master's thesis. If master's have two or more advisers, list as "Thesis Co-Adviser."

All signatories on a doctoral dissertation must be members of Penn State's Graduate Faculty, except in special cases approved by the Office of Graduate Enrollment Services. A person who receives special approval but does not attend the oral defense is designated as a **Special Signatory**. If the person does attend the defense, the term used is **Special Member**. On a master's thesis, the designation would always be Special Signatory.

Be sure that all signatories are identified by their correct professorial titles. Check with the program for current information. Do not use such designations as "Ph.D." or "Dr." on the signatory page or committee page. Administrative titles should not be included, with the exception of the head or chair of the major program. Only one administrative title should be used, as only one person is signing on behalf of the major program.

Abstract

Every thesis/dissertation must contain an abstract. An abstract is a concise summary of the thesis/dissertation, intended to inform prospective readers about its content. It usually includes a brief description of the research, the procedures or methods, and the results or conclusions. An abstract should not include internal headings, parenthetical citations of items listed in the reference section, diagrams, or other illustrations.

The abstract follows the committee page and has the heading ABSTRACT at the top. It always begins on page iii. There is no restriction on the length of the abstract in the thesis/dissertation, but a separate abstract required for the ProQuest/UMI Agreement form is limited to 350 words (doctoral only).

Table of Contents

The table of contents is essentially a topic outline of the thesis/dissertation. It is compiled by listing the headings in the thesis/dissertation. You may choose to include first-level headings, first- and second-levels, or all levels. Keep in mind that there usually is no index in a thesis/dissertation, and thus a fairly detailed table of contents can serve as a useful guide for the reader. The table of contents must appear immediately after the abstract and should not list the abstract, the table of contents itself, the frontispiece, the epigraph, or the vita. It should include everything else that appears **after** the table of contents, including the list of figures, list of tables, etc. (See example in Appendix A of this guide.)

Be sure that the headings listed in the table of contents match word-for-word the headings in the text. Double check to be sure that correct page numbers are shown. In listing appendices, indicate the title of each appendix. If using display pages, the number of the display page should appear in the table of contents.

List of Figures, List of Tables, etc.

Include a list of figures (illustrations) and a list of tables if you have one or more items in these categories. Use a separate page for each list. Show the caption and page number of every figure and table in the thesis/dissertation. Also include lists for abbreviations, nomenclature, maps, etc.

Preface

A preface usually is not necessary and is called for only when the genesis of the work needs to be explained or the author's contribution to a multiple-authored work needs to be noted. If there are separate sections for preface and acknowledgments, the preface comes first.

Acknowledgments

An acknowledgments page is required only if the author has received permission to use copyrighted material or must acknowledge grant sources. Otherwise, it is optional. If included, it is used to express the author's professional and personal indebtedness.

Epigraph or Frontispiece

Some authors include a quotation (epigraph) or illustration (frontispiece) as the last page of the front matter. These should not be listed in the table of contents. The source of an epigraph is indicated below the quotation but need not be listed in the bibliography.

BACK MATTER

The back matter (or end matter) of the thesis/dissertation may include some or all of the following items:

- bibliography or references (may be in back matter or at the end of each chapter)
- appendices (may come either before or after references)
- endnotes or notes (if any, they may be in back matter or at the end of each chapter)
- vita (required in doctoral dissertation, always as the last page and unnumbered)

Bibliography or References

A thesis/dissertation must include a bibliography or reference section listing all works which are referred to in the text, and in some cases other works also consulted in the course of research and writing. This section may either precede or follow the appendices (if any), or may appear at the end of each chapter. Usually a single section is more convenient and useful for both author and reader.

The forms used for listing sources in the bibliography/reference section are detailed and complicated, and they vary considerably among academic disciplines. For this reason, you will need to follow a scholarly style manual in your field or perhaps a recent issue of a leading journal as a guide in compiling this section of the thesis/dissertation.

Appendices

Material that is pertinent but is somewhat tangential or very detailed (raw data, procedural explanations, etc.) may be placed in an appendix. Appendices should be designated A, B, C (not 1, 2, 3 or I, II, III). If there is only one appendix, call it simply Appendix, not Appendix A. Titles of appendices must be listed in the table of contents. Appendix pages must be numbered consecutively with the text of the thesis/dissertation (do not number the pages A-1, A-2, etc.).

Vita

Required only in doctoral dissertations, the vita must be the last page of the document. It must not have a page number and must not be listed in the Table of Contents. The word Vita and the author's name should appear at the top. A standard outline style or a prose form may be used. In no case may the vita be more than one page in length. Examples of vitas can be seen at https://etda.libraries.psu.edu/catalog?sort=last_name_ssi+asc%2C+title_ssi+asc.

TABLES AND FIGURES

A **table** is a columnar arrangement of information, often numbers, organized to save space and convey relationships at a glance. A rule of thumb to use in deciding whether given materials are tables or figures is that tables can be typed, but figures must be drawn.

A **figure** is a graphic illustration such as a chart, graph, diagram, map, or photograph.

Captions and Numbering

Each table and each figure in the text must have a number and caption. Number them consecutively throughout, beginning with 1, or by chapter using a decimal system.

Placement of Tables and Figures

It is best to place a table or figure immediately after the first mention of it in the text—on the same page if there is room, or on the following page. Alternatively, tables and/or figures may be grouped together at the end of each chapter. Tables or figures of peripheral importance to the text may be placed in an appendix. Tables and figures must be referred to in the text by number, not by a phrase such as “the following table.”

Sources

If a figure or table is taken from another source, indicate the source at the bottom, either at the end of the caption or in a note beginning “Source:...” Source notes are not numbered, even if there are other numbered notes. If a figure or table is copied from its source, be sure it is large enough to be readable.

OVERSIZED MATERIALS

If you are having trouble fitting a table or figure within the margins, even after relaxing each margin by .25 inch, consult the following options and select the method you prefer.

Landscape Pages

Place a table or figure sideways (landscape style) on the page by rotating it 90 degrees **counterclockwise** from its normal position. Rotate the caption or heading also, so that all parts can be conveniently read together. The page number may be rotated with the figure if the author chooses.

Separate Caption Page

Use the entire page for the table or figure and place the caption on a separate page preceding it. Type the caption in the same direction (landscape or portrait).

Reduced Type Size

Reduce the font size of the table or figure. The size should be no smaller than 9-point

COPYRIGHT, AUTHORSHIP, AND PROQUEST/UMI

Copyright

Copyright is legal protection of intellectual property—in this case, your thesis or dissertation. This protection, in accordance with the U.S. Copyright Act of 1976, begins automatically as soon as a work is created. It is up to you to decide if you wish to maintain or register your copyright; Penn State has no requirement that you do either.

Copyright ownership means that you have the exclusive right to print, reprint, copy, sell, and prepare derivative works based on your work. Copyright law protects an author against infringement of these rights. There are, however, limitations on your exclusive right:

1. Others may excerpt portions of your thesis/dissertation for scholarly work or research without obtaining your permission, if the borrowing is “fair use.” Of course, they must credit you as the source. Anything beyond “fair use” requires permission.
2. In the case of a doctoral dissertation, ProQuest/UMI has the right to sell copies of the dissertation in and from microfilm or electronic format.
3. Penn State has the right to make single copies of the work for nonprofit purposes.

You may insert a copyright notice on the title page as shown in the example in Appendix A of this guide. However, this is not required. Keep in mind, though, that it signals to readers that you acknowledge your legal rights and that you are the copyright owner. You may also choose to register your claim to copyright by filling in the appropriate section of the ProQuest/UMI Doctoral Agreement and paying the fee or by writing to the Copyright Office, Library of Congress, Washington, DC 20559, and requesting a TX application form. This is a legal formality that makes a public record of your copyright and provides additional protections if another party violate your copyright. It is not a requirement. If you have developed a separately marketable item, you may want to complete this procedure.

All doctoral dissertations have an abstract available for worldwide access, but the student can decide how widely the body of the work will be available (see page 2). This should be considered carefully, taking into consideration publishing, proprietary issues, and issues associated with public disclosure. Public access to abstracts and dissertations is a form of public disclosure. Any enabling public disclosure of patentable inventions has an immediate and irreversible effect on both U.S. and foreign patent protection including the possible loss of certain patent rights. For more information, contact Penn State’s Intellectual Property Office.

For more information on copyright ownership, consult the U.S. Copyright Office website at <http://lcweb.loc.gov/copyright/>, or ProQuest at www.proquest.com.

Microfilming and ProQuest/UMI

All dissertations at Penn State are microfilmed and made available for sale by ProQuest/UMI

Dissertation Publishing. Penn State maintains this arrangement because it believes that knowledge should be disseminated to the public rather than restricted.

Information Regarding the ProQuest/UMI Publishing Agreement

As a public research university, Penn State has an obligation to ensure that information arising from the research and scholarship of its faculty and students is made available to the public. The doctoral dissertation, as an examination document, is a primary source for such information and has historically been made available in hard copy format through placement in the University Libraries and through mechanisms such as inter-library loan. With the advent of electronic document systems, dissertations can now be placed in the public domain and made available for worldwide access through the University Libraries digital collections.

All dissertations must be submitted electronically in order to facilitate and support their availability to the public. If it is necessary or advisable to temporarily restrict access to the eTD (allowable for a period of two years), generally based upon a request from the Office of Technology Management in consultation with the student and adviser, the student may do so by choosing one of two restricted release options indicated on the Doctoral Signatory Page: **Penn State Only** (the eTD is available only to those with active Penn State Access Accounts for a period of two years) or **Restricted** (the eTD is available to no one for a period of two years). The Restricted option is used exclusively for dissertations with patent issues. After two years, the eTD is released (**Open Access**) unless the author requests an extension through the Office of Theses and Dissertations.

All doctoral dissertations at Penn State are submitted for microfilming to ProQuest/UMI Dissertation Publishing, which is the offsite repository of the Library of Congress for dissertations and theses produced in accredited, graduate-degree granting U.S. institutions. According to ProQuest/UMI, each dissertation is professionally microfilmed and two copies are archived in perpetuity and digital copies are backed up to magnetic tape. Penn State has maintained this arrangement for over 50 years for preservation purposes, because it wishes to enhance wide accessibility of information and believes that knowledge should be disseminated to the public rather than restricted. ProQuest/UMI Dissertation Publishing also makes available for sale copies of the full work, with royalties (10%) that accrue to \$10.00 or more in any year payable to the author. More recently, ProQuest/UMI Publishing has added options for open access (at additional cost), as well as release restriction options related to their publishing services.

Since doctoral dissertations at Penn State are ultimately placed in open access through the University Libraries, any release restrictions needed are imposed prior to submission of the eTD to ProQuest/UMI. *The eTD will not be made available to ProQuest/UMI until it has been placed in open access through the University Libraries, and selection of any ProQuest/UMI option other than Traditional Publishing would be redundant and incur unnecessary costs.*

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Master's Title Page

Doctoral Committee Page

Master's Committee page

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The Pennsylvania State University

The Graduate School

College of Engineering

**A DESIGN METHODOLOGY OF MULTI-FLOW
CONDENSER WITH FLAT EXTRUDED TUBES**

A Dissertation in

Mechanical Engineering

by

John J. Doe

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

May 2014

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Professor of Mechanical Engineering
Dissertation Adviser
Chair of Committee

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Associate Professor of Mechanical Engineering

Kenneth K. Kuo
Distinguished Professor of Mechanical Engineering

Jeffrey L. Kohler
Associate Professor of Mining Engineering

Richard C. Benson
Professor of Mechanical Engineering
Head of the Department of Mechanical Engineering

*Signatures are on file in the Graduate School.

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