# TABLE OF CONTENTS

LIST OF TABLES ........................................................................................................ vi
LIST OF FIGURES .................................................................................................... vii
NOMENCLATURE .................................................................................................... viii
FOREWORD ........................................................................................................... ix
ACKNOWLEDGEMENT ......................................................................................... x
Abstract .................................................................................................................. xi

1. Introduction ........................................................................................................ 1
   1.1 The Importance of Standards ................................................................. 1
   1.2 The Role of the Office of Graduate Education ...................................... 1
   1.3 Style Guides ............................................................................................. 2
   1.4 Decisions to Make Before You Write ................................................... 3
   1.5 Style Guide Usage .................................................................................. 4

2. Preparing Your Manuscript ............................................................................. 6
   2.1 Formatting and Style Basics ................................................................... 6
      2.1.1 Choosing a Font ............................................................................. 7
      2.1.2 Pagination ..................................................................................... 7
      2.1.3 Figures and Tables ......................................................................... 8
      2.1.4 Equations ...................................................................................... 9
      2.1.5 Section Headings .......................................................................... 10
   2.2 Organization and Section Details ............................................................. 11
      2.2.1 Title Page ...................................................................................... 12
      2.2.2 Copyright Notice ........................................................................... 13
      2.2.3 Table of Contents .......................................................................... 13
      2.2.4 List of Tables ................................................................................ 14
      2.2.5 List of Figures ................................................................................. 14
      2.2.6 Nomenclature ............................................................................... 15
      2.2.7 Forward, Preface, and Acknowledgements .................................... 16
      2.2.8 Abstract ........................................................................................ 16
      2.2.9 Body .............................................................................................. 16
      2.2.10 References ................................................................................... 17
      2.2.11 Appendices .................................................................................. 17
   2.3 References and Reproduction .................................................................... 18
      2.3.1 Choosing a Citation Style ............................................................... 18
      2.3.2 Preparing Your References ............................................................. 20
      2.3.3 In-Text Citations .......................................................................... 22
      2.3.4 Online Sources ............................................................................. 23
      2.3.5 Footnotes ....................................................................................... 24
      2.3.6 Reproduced Tables, Figures, and Datasets ..................................... 24
         2.3.6.1 Reproducing Copyrighted Tables and Figures ....................... 24
      2.3.6.2 Datasets .................................................................................... 25
APPENDICES

REFERENCES

4. Academic Integrity

4.1 Plagiarism

4.2 Self Plagiarism

4.3 Using Copyrighted Materials

REFERENCES

APPENDICES

Appendix A Sample Title Pages

Appendix B Sample Copyright Page

Appendix C Sample Contents Page

Appendix D Chapter Attributions

Appendix A Sample of Master’s Thesis or Project Title Page

Appendix A Sample of Doctoral Dissertation Title Page

Appendix A Sample Title Pages

Appendix A Sample of Master’s Thesis or Project Title Page

Appendix A Sample of Doctoral Dissertation Title Page

Appendix C Sample List of Tables

Appendix C Sample List of Figures

Appendix C Sample List of Figures

Appendix D Sample Front Matter from a Student’s Dissertation

Appendix D Sample of an Appropriate In-Text Attribution

Appendix D Sample In-Text Attribution from Student’s Work
Appendix E Uploading Permission Files (and Other Supplementary Files) ............. 66
Appendix F Captions .................................................................................................. 68
  F.1 Sample of a Figure and Figure Caption.............................................................. 68
  F.2 Sample of Figure and Table Captions from Students’ Work......................... 69
Appendix G Formatting Examples for Common Problems......................................... 71
  G.1 Sample Formatting of an Equation ................................................................... 71
  G.2 Sample Equations from Student’s Work............................................................ 72
  G.3 Sample of a Landscape-Oriented Page .............................................................. 73
  G.4 Sample Landscape Oriented Pages from Students’ Work .............................. 74
LIST OF TABLES

Table 2.1: Basic format specifications for a thesis or dissertation ........................................ 6
Table 2.2: Organization of a thesis or dissertation ................................................................. 11
Table 2.3: Recommended citation styles by school ................................................................. 19
Table 2.4: Reference management tools* ................................................................................ 21
Table 2.5: CRediT roles chart developed by the Contributor Roles Taxonomy Project [32] ...... 28
Table 3.1: Accepted supplemental file types for electronic submission [8] ............................. 36
Table G.1: Sample landscape-oriented table caption ............................................................... 73
LIST OF FIGURES

Figure A.1: Sample of a Master’s thesis Title Page................................................................. 52

Figure A.2: Sample of a dissertation Title Page ........................................................................ 54

Figure C.1: Sample of a Table of Contents page from a student’s dissertation [52] ............... 61

Figure D.1: Sample of an attribution of a work previously submitted for publication in a student’s dissertation [54] .................................................................................................................. 65

Figure E.1: Screenshot of uploaded supplementary files on ProQuest [58] ............................. 66

Figure E.2: Sample of a student’s list of supplementary files, including permission files [58]... 67

Figure F.1: Math exam [55] ..................................................................................................... 68

Figure F.2: Sample of a figure and figure caption from a student’s dissertation [56] .......... 69

Figure F.3: Sample of a table and table caption from a student’s dissertation [54] ............ 70

Figure G.1: Sample of multiple types of equations from a student’s dissertation [57] ........ 72

Figure G.2: Sample of a landscape oriented figure with top-right page numbers from a student’s thesis [59] ............................................................................................................................. 74

Figure G.3: Sample of a landscape oriented page with bottom-right page number from a student’s dissertation [60] .................................................................................................................. 75
NOMENCLATURE

Caption – A brief explanation or title for a table, figure, or image which is distinguished from the regular body text and used to list the item in the front matter.

Citation – The shortened form of a reference that is used within the Body text of a manuscript which then refers to the complete listing in the reference, often by bracketed number, superscript number, or author’s last name.

Embedded Fonts – Font type that is saved within a PDF file in a way that will appear in the file as set by the author regardless of computer used by the reader. Unembedded fonts may be altered by the reader’s computer if not compatible with the computer’s software.

Font – Term used as a general term to refer to the overall appearance of the text in the document (type, weight, size, slant, etc.)

Font Type – Term used to refer to the name of the font used. This manual uses “Times New Roman,” for example.

Front Matter – The portion of a thesis or dissertation that comes before the body. Front matter often includes the Table of Contents, List of Figures, List of Tables, Acknowledgement, and Abstract among other optional pages.

Reference – The complete information provided for source material formatted in accordance with a particular style guide. This manual uses the style guide of the Institute of Electrical and Electronics Engineers (IEEE), for example.

Sentence Case – The capitalization of a sentence or phrase in which only the first letter of the first word is capitalized (as found in conventional sentence structure). All proper names should still be capitalized.

Size – Term used to describe a font and refers to the magnitude of the text and is measured in printer’s “points (pt.)”

Slant – Term used to describe a font and refers to whether text is italicized or straight.

Style Guide – A written set of requirements that inform the appearance, formatting, reference type, grammatical usages, and general stylistic structure of a manuscript.

Template – A blank document or document with place-holder text that upholds the formatting requirements of a particular style guide. A student may then fill in the template with their own information which will then be correctly formatted.

Title Case – The capitalization of a sentence or phrase in which the first letter of every word is uppercase. Articles (“the,” “and,” “an,” etc.) are not capitalized.

Weight – Term used to describe a font and refers to whether text is bolded or regular.
FOREWORD

Congratulations!

If you are reading our PREPARATION MANUAL FOR DISSERTATIONS AND THESES, you are close to completing your graduate studies at Rensselaer Polytechnic Institute and joining an elite group of individuals.

I am glad you are spending the time and effort needed to prepare a properly formatted Master’s thesis or Doctoral dissertation. In December 2016, we learned that each dissertation is downloaded an average of 25 times per year. The number of people who are viewing dissertations is much higher.

Your dissertation or thesis is the culmination of a great deal of hard work, but it is also the springboard of your career. Whether you are going on to earn another degree, teach at another college campus, or go into industry research, it is important that your thesis serves as an excellent example of your research and your potential. It should be properly formatted and well-constructed so that anyone who reads it will be impressed with your research, as well as your ability to communicate that research to a wider audience.

Consider writing your thesis as the final professional development opportunity at Rensselaer. The Office of Graduate Education is happy to provide you with this PREPARATION MANUAL FOR DISSERTATIONS AND THESES, a guide to presenting your research in a polished and professional manner.

The time you spend learning how to organize your thesis and references now, will save you hours—possibly days—in revisions at the end of the process.

I look forward to welcoming you to the elite group of advanced degree holders. Until then, all my best wishes for productive drafts and revisions—and a glowing thesis defense.

Sincerely,

Stanley Dunn, PhD

Vice Provost and Dean of Graduate Education
ACKNOWLEDGEMENT

You may wish to acknowledge faculty advisors, committee members or other individuals or institutions who supported your research or provided technical assistance.

Product names mentioned in this manual are used for illustration purposes only and are not intended as endorsements or requisite.

Of the many exceptional graduate students of Rensselaer, we would especially like to thank those who have allowed us to use their work as examples within this manual: Cameron Smith, Li Dong, Brendan DeCourcy, William Kronmiller, Megan Fung, and Troy Vargason. We hope that the pages of their work will serve as helpful examples to future graduate students.

We would also like to thank all of the graduate students of Rensselaer Polytechnic Institute, present and future, for the incredible work they do and their perseverance to complete the rigorous and exciting academic requirements here. As your journey of higher education is, in some cases, almost over we would also like to thank you for your diligence in formatting and editing your dissertations and theses to uphold the standards set by the Office of Graduate Education.
ABSTRACT

Rensselaer requires every Doctoral candidate to submit a Doctoral dissertation and Master’s candidates in research-based programs to submit a thesis to the Office of Graduate Education (OGE) in partial fulfillment of their degree requirements. The only exceptions to this rule are those Master’s candidates in course-based programs or programs that require a project to fulfill their degree requirements who must submit their work to their advisor. Students in project based programs have the option of submitting their completed project report to OGE in accordance with the Master’s candidate preparation and submission process demonstrated in this manual.

This manual is intended to provide students with the Institute requirements for writing and submitting a thesis, project, or dissertation and includes information about manuscript preparation and the submission process. This manual in itself is designed to act as a guide for, and example of, the formatting standards for thesis and dissertation submissions.
1. INTRODUCTION

1.1 The Importance of Standards

Throughout your career as a graduate student, you have been responsible for upholding the standards of the Rensselaer community and the academic community at large. Standards create an equal level of quality for all students’ work and set an equal level of achievement that all students must fulfill in order to complete their graduate careers. Standards create the basic level of quality in any practice or discipline. Without a commitment from all members of the community to follow the same standards, intellectual inquiry would suffer. A high standard of scholarship, investigation and integrity has been expected of you – as a student and as a researcher.

Now that you have completed a significant research project, it is time to communicate your findings. It is expected that your thesis or dissertation will meet a high standard of organization, composition and illustration. These standards allow for a level of mutual understanding among varied audiences. Holding all students to a clearly defined and attainable standard ensures continuity among the work of all graduate students who may otherwise be held to very different expectations departmentally.

1.2 The Role of the Office of Graduate Education

OGE serves to create and maintain standards of academic achievement and integrity for all graduate students at the Institute. We want all of our students to achieve the highest level of academic success possible; part of that success comes from the professional development of a student throughout their graduate education. As the last step in this process of professional development, OGE asks students to use the standards and guidelines put in place to create a well-formatted thesis or dissertation that reflects well upon both student and Institute.
While the content within each thesis or dissertation is as varied as every graduate student from Communications & Rhetoric Doctoral candidates to Mechanical Engineers, the style and appearance of every document must follow a standard form. OGE knows how important it is that anyone in your discipline and beyond has access to the amazing ideas included in your thesis. The requirements of formatting that we uphold increases that accessibility, ensuring that all Rensselaer theses and dissertation are clear, legible, and maintain academic integrity.

1.3 Style Guides

Style guides contain information about and directions for formatting the order of the major sections in a document, the acceptable appearance standards, and the correct means of including source material. Some are even as specific as to include information on grammatical conventions specific to that style. Style guides contain very specific instructions for how each piece of your work must appear in order for it to be approved.

Style guides are used by all publishers and vary based on publication, discipline, and publication format (print, online, etc.). Any time you prepare a manuscript to submit for publication you will be asked to format that manuscript and cite your sources exactly as prescribed by the style guide for that specific publication. In some circumstances, how well formatted your manuscript is could affect whether or not it is chosen for publication. At the very least, referring to the appropriate style guide when preparing a manuscript will cut down on the number of revisions you will have to make before your work can be published.

Style guides ensure that by the time a piece makes it to publication, it is in a form that is familiar and accessible to potential readers. In a journal or edited volume, for instance, if all contributions did not follow the same formatting and citation guidelines, readers may have a
difficult time understanding the work or looking to the source material for further information on the topic.

In order to help students comply with the standards of formatting and academic integrity, OGE has created this Preparation Manual for Dissertations and Theses. This Manual, like other style guides, contains all of the requirements that you will need to follow in order fulfill the standards of publication for Rensselaer.

1.4 Decisions to Make Before You Write

There are many decisions you will have to make before you begin writing any professional academic document. The most important of these is the style guide that you will use to format your manuscript and references. Again, this choice is often dictated by where you intend to publish your work. In the case of your thesis or dissertation, the OGE style guide is the one you will use. Within this, as with other style guides, there are more choices to make:

1. Reference style guide
2. Template usage
3. Style variances

The most important of these is your reference format. OGE does not have its own specified reference format and instead allows students to choose a reference style commonly used in their own discipline. The chosen reference style must be followed exactly. You can find more extensive information on reference styles and choosing a reference style in section 2.3 References and Reproduction.¹

¹ The links in this manual have intentionally been left blue and underlined for your convenience. Throughout the manual you may also find text printed in red which is used to highlight examples and important information. All text and links within your thesis or dissertation must be black and links should not be underlined.
The second choice you will have to make is whether or not you will use a template to format your manuscript. Available templates are a great resource but utilizing one does not the place of following this style guide. Finally, you will have to make decisions about some of the document features for which variances are allowed. For instance: page number placement, typeface, and heading/subheading styles. Often, questions about what choices to make regarding variances allowed by this guide may be answered by the style guide for your chosen reference style. Further information on making all of these decisions can be found throughout this style guide.

### 1.5 Style Guide Usage

OGE, in response to changing technology, revises this manual on an as-needed basis and publishes the most currently revised document on the OGE website [1]. You can consult the Rensselaer catalog [2] and the academic calendar [3] for due dates related to thesis defense and submission. You should also review the appropriate checklist for degree completion requirements:

- **Master’s Candidates** [4]
- **Doctoral Candidates** [5]

The subject of the dissertation or thesis is selected in consultation with the department member designated as the candidate's thesis or dissertation advisor or committee chair. OGE approves the final dissertation or thesis and will not approve any thesis or dissertation that deviates from the requirements in this manual. Please read this manual carefully, paying close attention to the sample pages in the Appendices. In addition to structural formatting, you are also responsible for ensuring that your manuscript follows conventional rules of grammar, punctuation, and spelling. The Rensselaer Libraries maintains a file of style guides sponsored by professional societies and of instructions for authors issued by professional journals in your discipline [6].
Please visit the Library Service Desk for more information. We also recommend that you seek assistance from your advisor for any formatting requirements that may be unique to your discipline. In the event of discrepancies, OGE formatting standards supersede those of any other guide. We encourage you to bring your draft to the Office of the Graduate Education before your defense date for a preliminary review (see section 2.4.3 Preliminary Reviews for more information on preliminary reviews).
2. PREPARING YOUR MANUSCRIPT

This chapter of the manual will help you meet the formatting and appearance requirements for your thesis or dissertation. The formatting requirements that follow are not suggestions or guidelines but indicate necessary formatting standards that all Rensselaer theses and dissertations must follow in order to be approved by OGE to fulfill graduation requirements.

2.1 Formatting and Style Basics

The basic required specifications for electronic manuscripts are as follows:

<table>
<thead>
<tr>
<th>Color</th>
<th>Text must be black, including URLs (which should also not be underlined).² Pictures or figures may be in color.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Font</td>
<td>The same size, weight, and slant must be used throughout the entire document. Font size should be no smaller than 10 point. You may use a different size or weight for headings, captions, formulae, or to meet a specific need of the thesis (e.g. use of italics for quotes), but it should be the same font type as the rest of your document. Section headings should have consistent capitalization, either Sentence case or Title Case, throughout.</td>
</tr>
<tr>
<td>Spacing</td>
<td>Text should be spaced no closer than four lines per inch. The standard for ProQuest [7] submissions is to double-space all major text sections with the exception of block quotes, the contents pages in your front matter, figure and table captions, footnotes, and references which may be single spaced [8].</td>
</tr>
<tr>
<td>Margins</td>
<td>All page margins should be set at 1 inch. Text, equations, tables and figures must all fit within the defined margins of the page.</td>
</tr>
</tbody>
</table>

The OGE website provides a helpful formatting checklist [9] to give an overview of formatting and style requirements.

² Again, the links in this Manual have intentionally been left blue and underlined for your convenience.
2.1.1 Choosing a Font

ProQuest guidelines [8] recommend using a TrueType font. Web fonts—which are most legible for documents that will be read online—that are TrueType fonts include: Arial 10pt, Georgia 11pt, Times New Roman 12pt (used in this document), Trebuchet 10pt, and Verdana 10pt. A full list of ProQuest recommended fonts, along with information on embedding fonts can be found on the ProQuest website [8].

2.1.2 Pagination

All theses and dissertations must follow a specific method of pagination as a standard for manuscripts submitted by graduate students at Rensselaer. This section provides guidelines for numbering pages throughout your thesis or dissertation.

- All pages must include a page number, except for the thesis/dissertation title page.
- Begin the numbering of the front matter with lowercase Roman numeral “ii” placed at the bottom center at least ¾ inch from the bottom of the page.
- Starting with the body of the document, pages must be numbered with Arabic numerals (starting with Arabic numeral “1”) and continue consecutively throughout the entire document, including Appendices.
- All pages in the front matter and the first page of every major section must be numbered at the bottom center. All other pages may be numbered either in the bottom-center or the upper right hand corner ¾ inch in from the edges of the page. Your chosen placement must remain consistent throughout the entire document [8].

| All pages introducing a major section or chapter of the document must have page numbers positioned at the bottom center of the page, regardless of where page numbers are located throughout the rest of the thesis or dissertation. |

---

3 “Front matter” is a reference to the material in your thesis or dissertation that follows your title page and precedes the first page (first page of the first chapter) of the body of the document. Front matter includes the Table of Contents, Acknowledgement, etc.

4 The “body” of the document refers to the section of the thesis or dissertation following the “front matter,” beginning with the first page of the first chapter.
2.1.3 Figures and Tables

All figures and tables should be original work. In the event it is necessary to use an item from another source, it must be cited and referenced appropriately.

If the table/figure is from a copyrighted source, obtain permission to reproduce it in your thesis. See section 2.3.6 Reproduc for more information on obtaining reproduction permissions and how to include them in your thesis.

Tables should be formatted consistently throughout with the same lines, borders, and shading. The captions for tables and figures should be formatted consistently with each other and throughout your thesis/dissertation and have consistent punctuation and consistent capitalization—either Sentence case or Title Case (which should be the same capitalization used in your List of Tables and List of Figures).

Figures and tables should be centered within the margins of the page and must not exceed the defined page margins. This may require figures or tables to be resized accordingly. Figure and table captions should have consistent alignment (left or centered) throughout the entire text of the document. Figure captions are located below a figure and should be on the same page as the figure. Tables captions are located above a table and should be on the same page as the table. The font used for the caption text may be a different size than the font in the rest of the document but should be the same font type and must be in bold. Where not prohibited by size, the entire table/figure and its captions should be on the same page, not split between two.

Figure and table captions must also have a delimiter—either a period or colon—separating the figure/table number from the caption. There should be a space after the delimiter and before the caption text. Please see the examples below in which the delimiter is shown in red for emphasis:
Figure 1: Figure Caption

OR

Figure 1. Figure Caption

However you choose to format your table and figure captions within these specifications, they must be the same as each other and consistent throughout the entire document. For instance, if you choose to center your figure captions and use a colon as a delimiter, you must also center your table captions and use a colon as a delimiter. Please see Appendix F Captions for examples.

Note: Pages which contain landscaped figures, tables, or images must have page numbers positioned so that, when printed, they fall in the same location as the rest of the document. Page numbers should not be placed in the right margin. An example of a landscape oriented page can be found in Appendix G.

2.1.4 Equations

Equations must be centered within the margins of the page and must not exceed the defined page margins. This may require equations to be resized accordingly. Every equation used in a thesis or dissertation must be numbered. Equation numbers must be right aligned and listed parenthetically. If it is necessary to reference the source document for the equations, the citation should appear in line with the text describing the equation, not within the parentheses of the equation number. In the example below the equation number is shown in red for emphasis:

\[ a^2 + b^2 = c^2 \]  \(1\)

No word or abbreviation for “equation” should appear in parentheses, only the equation number which may be identified consecutively throughout the entire manuscript (1, 2, 3, 4…) or consecutively with chapter designations (2.1, 2.2, 3.1…). While some students choose to include a List of Equations, it is not required. If you choose to include a List of Equations, it should be formatted consistently with the Lists of Tables and Figures (see 2.2.4 List of Tables and 2.2.5 List
of Figures). More examples of the formatting of equations within your text, including long equations and multi-line equations, can be found in Appendix G Formatting Examples for Common Problems.

2.1.5 Section Headings

The headings of each of your major sections and subsections should be formatted consistently throughout your dissertation and have consistent capitalization, either Sentence case or Title Case (which should be the same as the capitalization used in your Table of Contents).

Headings should be the same font type as the rest of your manuscript but may vary in size, weight, and slant. While headings may vary in style and weight, indentation, and spacing based upon level, headings at each level must be consistent with each other (i.e. all level 1 headings are the same, all level 2 headings are the same, etc.). Below is an example of a 4 level system of headings and subheadings. This is an example of one possible means of formatting headings and is not meant to serve as a template. Your own headings may vary at your discretion.

1. Level 1 text is larger, bolded, and centered.
1.1 Level 2 is larger than normal text but smaller than level 1 text and bolded.
1.1.1 Level 3 text is the same size as normal text and bolded.
1.1.1.1 Level 4 Text is the same size as normal text and italicized.

All levels of sections and subsections should be numbered and listed in consecutive order on the Table of Contents. Some templates available may not automatically include listings for subsections beyond level 3; they must be added manually.

Many style guides also contain information on the formatting of multiple levels of section headings. If this is the case, we recommend formatting your section headings according to the style you chose for your citation formatting.
2.2 Organization and Section Details

The organization of your manuscript is important and must remain consistent with OGE standards ensuring that all Rensselaer theses and dissertations are uniform in format. This section will present more particular formatting specifications for various aspects of thesis and dissertation preparation. It is also intended to highlight some areas of concern and items to attend to while preparing your document.

A thesis or dissertation includes the following sections which must follow the order shown in Table 2.2, below:

Table 2.2: Organization of a thesis or dissertation\(^5\)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Title Page</td>
</tr>
<tr>
<td>2.</td>
<td>Copyright Notice</td>
</tr>
<tr>
<td>3.</td>
<td>Table of Contents</td>
</tr>
<tr>
<td>4.</td>
<td>List of Tables</td>
</tr>
<tr>
<td>5.</td>
<td>List of Figures</td>
</tr>
<tr>
<td>6.</td>
<td>Nomenclature</td>
</tr>
<tr>
<td>7.</td>
<td>Preface, Foreword, Acknowledgements</td>
</tr>
<tr>
<td>8.</td>
<td>Abstract</td>
</tr>
<tr>
<td>10.</td>
<td>References/Bibliography/Literature Cited</td>
</tr>
<tr>
<td>11.</td>
<td>Appendix</td>
</tr>
</tbody>
</table>

*Required if Student chooses the copyright option.
**Required if tables and/or figures are in the document.

Please refer to the APPENDICES to view examples of formatted pages as described in this section.
2.2.1 Title Page

This section provides a list of requirements for the title page of your thesis or dissertation. The formatting of your Title Page must match these guidelines exactly. Examples of full Title Pages for each type of document (Master’s Thesis, Master’s Project, and Doctoral Dissertation) can be found in Appendix A Sample Title Pages. Please note that as of 2018 the Title Page has been reformatted to remove committee signature lines. All text on the title page is now centered within the margins of the page. The requirements are as follows:

- The title page must not include a page number, although it is considered page “i” of the document. The Title Page should not be listed on your Table of Contents.

- For the Doctor of Engineering degree, substitute "DOCTOR OF ENGINEERING" for "DOCTOR OF PHILOSOPHY.” For the Master of Engineering degree, substitute “MASTER OF ENGINEERING” for “MASTER OF SCIENCE.”

- If the thesis is submitted to OGE prior to the month of graduation (the only months of graduation are May, August and December), include the actual month and year of completion at the bottom of the title page (do not use the day of the month), for example:

  [May 2018]
  Submitted April 2017

- All Committee Members must be listed with the Committee Chair indicated.

  Department information is now found at the bottom of the Title Page. This should indicate the full name of your department. Please refer to the samples found in Appendix A Sample Title Pages.
2.2.2 Copyright Notice

This section provides a list of requirements for the copyright page of your thesis or dissertation (if applicable). See Appendix B Sample Copyright Page for an example of a copyright notice page.

- Candidates who intend to file a copyright application with the U.S. Copyright Office must include a copyright notice as the second page of the thesis. The notice consists of three parts: the copyright symbol “©” and/or the word copyright, the name of the copyright owner, and the year of publication.

- The copyright notice is always page “ii” of the front matter of your thesis or dissertation but should not appear on the Table of Contents.

2.2.3 Table of Contents

A Table of Contents is an essential part of any thesis or dissertation. This section provides a list of requirements for the Table of Contents page(s) of your thesis or dissertation. “Contents” should not be listed on the Table of Contents. The listing should start with the next required section (either List of Tables, List of Figures, Acknowledgement—or Abstract if none of the previous apply to your document). Sample Contents pages can be found in Appendix C Sample Contents Page. The requirements for the Table of Contents are as follows:

- The content listed on the CONTENTS page must not include the Title Page (or Table of Contents page).

- The first page of CONTENTS is numbered “ii” ("iii" if a copyright notice is included in the document).

- All numbering and lettering of section headings of the document must correspond identically to their numbering and lettering within the document.

- Titles must have consistent capitalization throughout the Contents. Titles must be capitalized in either Sentence case or Title Case and should correspond with the chosen capitalization for headings within the document.
• Page numbers must be right aligned.

• The text of the section heading listing should not run over into the page number column.

2.2.4 List of Tables

A List of Tables is required if you include a table in any part of your thesis/dissertation, including the Appendices. The List of Tables should follow your Table of Contents in the front matter of your manuscript and be numbered with lower case Roman numerals continuing from the last numbered page of the Table of Contents. The List of Tables should be formatted as follows:

• All numbering, lettering, and captions in the LIST OF TABLES must correspond **identically** to those within the document.

• The page number listed should be the page on which the table begins and should not be a range.

• Table titles must have consistent capitalization; either **Sentence case** or Title Case.

• Page numbers must be right aligned.

• Tables that come from other sources or include information taken from other sources MUST have a citation in the table caption. The citation should be formatted according to your chosen citation style guide.

The listings on the List of Tables must match the captions from the body of your text exactly. You cannot use a shortened version of the caption for your List of Tables.

2.2.5 List of Figures

Like the List of Tables, a List of Figures is required if you include figures in any part of your thesis/dissertation, including the Appendices. The term “figure” refers to any graphs, photographs, templates, and all other types of illustrations. The List of Figures should follow your List of Tables.
(if included) in the front matter of your manuscript and be numbered with lower case Roman numerals continuing from the last numbered page of the List of Tables (or Table of Contents if List of Tables is not included). The List of Figures should be formatted as follows:

- All numbering, lettering, and captions in the LIST OF FIGURES must correspond **identically** to their placement within the document.

- The page number listed should be the page on which the table begins and should not be a range.

- Figure titles must have consistent capitalization; either Sentence case or Title Case.

- Page numbers must be right justified.

- Figures that come from other sources MUST have a citation in the figure caption. The citation should be formatted according to the recommendations of your chosen citation style guide.

Again, the listings on the List of Figures must match the caption from the body of your text exactly. You cannot use a shortened version of the caption for your List of Figures.

| Note: All captions must appear in the List of Figures and List of Tables EXACTLY as they appear in the body of your text. |

### 2.2.6 Nomenclature

Some students choose to add a List of Nomenclature to serve as a guide for the readers to the jargon that will appear in their thesis or dissertation. The page should be neatly organized and legible and should come after the List of Figures and before the Acknowledgement section. If you choose to include a List of Nomenclature it should be treated as a major section of the manuscript and listed on the Table of Contents.
2.2.7 Forward, Preface, and Acknowledgements

The Forward, Preface, and Acknowledgement pages are optional additions to your manuscript which may describe how your study started and evolved, how the material has been organized and presented, or who assisted you throughout your studies. As part of the front matter, these pages will also be numbered consecutively from the preceding page using lowercase Roman numerals. Any/all of these sections must be listed on your Table of Contents in a manner consistent with listings of your other major sections.

2.2.8 Abstract

The Abstract is another required element of your dissertation. The abstract should be a unique description of the work explained within the thesis or dissertation and should not contain any references and should not be attributed to any of your own previously published work. An abstract contains a statement of the problem to be discussed in the thesis or dissertation, describes procedures or methods used, and briefly reviews results and conclusions. Continue to number these pages consecutively from the preceding page using lowercase Roman numerals. Unlike for submission to many journals, there is no limit to the length of the abstract that can be included in your document. Do not include figures or diagrams that include graphics in your Abstract. For example, a chemical formula may be used, but a diagram depicting chemical bonding is not acceptable.

2.2.9 Body

The Body of your thesis or dissertation is the main section of your manuscript. The Body begins with the first chapter (which is often an introduction) and is divided into chapters with subsections in each chapter. Every major section and subsection of the Body should be listed on the Table of Contents. The Body and Appendices (2.2.11 Appendices) are the only acceptable
places within your document to place and tables, figures, diagrams, or images of any kind. All
tables, figures, diagrams, and images must be appropriately captioned and listed in the List of
Tables or List of Figures in your front matter.

| Note: Beginning with “Chapter One,” pages are numbered with Arabic numerals through the remaining pages of the thesis or dissertation, including the separate tables and figures inserted at the appropriate points in the text and any appendices at the end. |

2.2.10 References

A References section is the last required part of your thesis or dissertation. Although most
students put their reference section after the Body of their thesis or dissertation (but before the
Appendices), some choose to include a list of References at the end of each chapter. When done
either way, the Reference section(s) must be included on the Table of Contents as a major section
of your work. If you include only one set of references at the end of your document, the section
should not be numbered and the heading should be formatted consistently with the front matter
headings. The Reference section may be listed as “References,” “Works Cited,” “Bibliography,”
etc. but the title should follow the conventions of your chosen citation style. For more detailed
information on References, please see section 2.3 References and Reproduction.

2.2.11 Appendices

Appendices should include any explanatory data, figures, or tables that do not appear in
the body of your thesis or dissertation. Each appendix should be listed in the Table of Contents
and any table or figure included in the appendices should be listed in the List of Tables or List of
Figures. Appendices and their subsections are often labeled with letters (A, A.1, A.1.1…) to

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6 Though not required, we highly recommend formatting your thesis or dissertation so that all references are listed in one section at the end. This reduces the number of duplicate references and the possibility of duplicate errors which can delay the review process.
distinguish them from the main text of the thesis or dissertation. If specified, please follow the guidelines set by your chosen citation style in labeling your appendices.

Any supplementary files included with your thesis/dissertation submission must also be listed and described in an appendix. See section 3.2.2 File Formats for Thesis or Dissertation and Optional Additional Files for more information on the inclusion of supplementary files.

2.3 References and Reproduction

2.3.1 Choosing a Citation Style

References to relevant literature should follow the commonly used style guide accepted in your field. A list of common citation styles for STEM fields [10] and Non-STEM fields [11] can be found on the OGE website. Table 2.3 outlines common citation styles for each school; this list is not intended to be inclusive or exhaustive but represents the most some of the most commonly used styles seen by OGE. Though it is not required that you use any of these, it is highly recommended and doing so may help to ease and expedite the OGE review process.

You should consult with your advisor about what the standard citation styles are for your discipline. Often students choose the style used by a journal in which they hope to publish in the future (or have published in in the past), reducing the need for editing and revising references later on. The chosen citation style should be the most up-to-date version available. If you choose to use a version other than the most recent (Chicago 15, for example) the version should be noted on your Record of Dissertation Exam form.
### Table 2.3: Recommended citation styles by school

| Architecture       | • Journal of the Acoustical Society of America ([JASA](#)) [12]  
|                    | • Institute of Electrical and Electronics Engineering ([IEEE](#)) [13]  
| Engineering        | • Institute of Electrical and Electronics Engineering ([IEEE](#)) [13]  
|                    | • American Institute of Aeronautics and Astronautics ([AIAA](#)) [14]  
|                    | • [Nature](#) [15]  
|                    | • Proceedings of the National Academy of Science ([PNAS](#)) [16]  
| HASS               | • Modern Language Association ([MLA](#)) [17]  
|                    | • American Psychological Association ([APA](#)) [18]  
|                    | • [Chicago](#) * [19]  
| Management         | • Academy of Management Journal ([AMLE](#)) [20]  
| Science            | • Institute of Electrical and Electronics Engineering ([IEEE](#)) [13]  
|                    | • [Nature](#) [15]  
|                    | • American Chemical Society ([ACS](#)) [21]  
|                    | • American Geophysical Union ([AGU](#)) [22]  
|                    | • Society for Industrial and Applied Mathematics ([SIAM](#)) [23]  
|                    | • American Physical Society ([APS](#)) [24]  
|                    | • Proceedings of the National Academy of Science ([PNAS](#)) [16]  

*NOTE: The Chicago Manual of Style [19] has 2 distinct formats (Notes and Bibliography and Author-Date) as may be the case with other citation styles. In those instances, one format should be chosen. A combination of the two cannot be used.

![You should identify your citation style before you begin writing and it should be a style commonly used in your field of study. Your advisor can help you choose the citation style that is most appropriate.](image)

Please note that if you choose an uncommon citation style or an outdated version of a citation style, you may be asked by OGE to provide the style guide that you used to format your references. This document is not intended to be used as a citation style guide in any way. The guide you use should be an official source for the citation style that you choose. Guides from other...

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7 IEEE is the reference/citation style used throughout this manual.
university writing centers’ websites may contain errors or inconsistencies not found in the official guides.

2.3.2 Preparing Your References

The organization and formatting of your references must be neat and legible. This is how your readers will be able to look up the background knowledge supporting your work and discover further reading in your field. The References section may be single spaced but should have spacing between each entry to enable easy access for your readers. The following are further requirements for formatting your references:

- Font must be the same as used throughout the main Body of the document.

- Where the use of footnotes is an accepted practice, these may appear at the bottom of a page, at the end of the thesis, or at the end of long chapters. If footnotes appear at the bottom of a page, the reference(s) cited must also appear in the References section of the thesis. Footnote citations alone cannot suffice for an acceptable Reference section.

- Footnotes are indicated by superscript numbers inserted in the text at the appropriate point.

- Footnotes may include references to pertinent literature (which should then be included as references in the reference section), or may simply consist of parenthetical elaboration.

- Check the library for examples of scholarly publications in your field.

- When citing websites, online journals, or any other online source, you must include the “Date Last Accessed mm/dd/yyyy” in the citation, whether or not it is required by your chosen citation style. See section 2.3.4 Online Sources for more information.

Some of the most popular reference management tools used for scholarly work can be found Table 2.4. Please note that reference management tools are intended to help organize and format your citations but are not a style guide in and of themselves. For instance, many students
will indicate “IEEEtran” on their Record of Dissertation Exam form or Record of Master’s Thesis and Oral Presentation form. “IEEEtran” is not a reference style in-and-of itself; it is actually a BibTeX [25] package designed to format citations in the IEEE reference style. So, a student in this case should indicate IEEE as their reference style—the program only serves to attempt to format references according to the established style. Though it is fine to use the program as an aid to formatting IEEE references, it does not replace the official IEEE Reference Guide [13] and is not a substitute for careful inspection of each reference in comparison to the examples given in the style guide.

When using these tools you still must make sure to input information correctly. For example, many of these tools will not alter capitalization for you so, if your style requires Title Case article titles, you have to enter them in Title Case. The only way to be sure all references are correct is to check that each individual reference matches the formatting, punctuation, and capitalization and contains all of the information required by your chosen style guide.

**Table 2.4: Reference management tools**

<table>
<thead>
<tr>
<th></th>
<th><strong>Microsoft Word</strong></th>
<th>Provides built-in reference tools which help to facilitate the creation and maintenance of your bibliography section [26].</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Zotero</td>
<td>A popular reference management program frequently used to prepare and maintain a reference section [27].</td>
</tr>
<tr>
<td>3</td>
<td>Mendeley</td>
<td>A separate standalone reference management tool used to manage references and generate a bibliography electronically [28].</td>
</tr>
<tr>
<td>4</td>
<td>BibTeX</td>
<td>A type of reference management software used for the formation and formatting of references sections. This tool is typically used in concert with the LaTeX document preparation system [25].</td>
</tr>
<tr>
<td>5</td>
<td>Endnote</td>
<td>A commercial reference management software package, used to manage references when writing essays and articles [29].</td>
</tr>
</tbody>
</table>
*Note: If you use these tools, or any other, they can fail to capture important information and often incorrectly format uncommon citations. It is your responsibility to carefully review every citation in your list of references and make sure it follows the correct formatting.

Some of these or other reference management tools also may allow you to alter formatting settings to accommodate specific changes required to meet OGE standards or any updated conventions of a citation style guide.

It is highly recommended that you review every reference with your citation style guide to make sure they are formatted correctly before submitting your thesis or dissertation. The references must exactly match the style guide and revisions by hand will most likely be necessary. Reference management tools do not always format citations correctly, especially for uncommon citation styles and reference types.

In addition to the various reference preparation and management tools outlined above, your advisor and examples of other publications in your field may provide insight into exactly which reference management tool may be most suitable for you.

2.3.3 In-Text Citations

Different citation styles have various means of citing references within the text. As with the reference section at the end of your thesis or dissertation, all in text references must be formatted according to your chosen citation style. The most common styles include superscript numbering (both with and without footnotes), bracketed numbers [1], numbers in parentheses (1), and authors name and date in parentheses (Last Name, YYYY). Each style in shown in red as an example. The type of in-text citation generally informs the organization of the reference section; systems that use the author’s last name generally require the reference section to be alphabetized, while numbered systems generally require references to be in numerical order according to their appearance in the text.

A common mistake that students make with their in-text references is in the placement of the citation. Check your citation guide to find out if the citation should be within the sentence, at
the end of the sentence, and before punctuation or following punctuation. Your citation guide will also provide information on citing multiple sources at once. Incorrectly listing multiple in-text citations is another common error in a student's manuscript. For instance, your citation style may require that you list multiple references in separate brackets—[1], [2], [14]—rather than within the same bracket—[1, 2, 14]. **Follow your citation guide carefully.** This is why it is important to follow the guide and not rely solely on a reference management program.

### 2.3.4 Online Sources

Please cite your online references as your citation style guide dictates including the full URL (i.e. the URL that links directly to the material you used, not just the website homepage). The date the URL was last accessed should always be included in the reference. This is necessary for OGE purposes, even if not required by your chosen citation style. If your chosen citation style does not include the access date, please add either of the following after the URL in the Reference section. For example:

`<Full citation in your chosen style>http://www.nameofwebsite.edu  (Date Last Accessed, Month, Day, Year)`

OR

`<Full citation in your chosen style>http://www.nameofwebsite.edu (Retrieved on Month, Day, Year)`

The “date last accessed” should be the date that you last visited the source prior to submitting your dissertation to OGE. If your citation style does not detail how to format online sources, please use the above examples as a guide.

In lieu of the URL and access date, listing a Digital Object Identifier (DOI) alone is also acceptable due to the accuracy of these designations. If using a DOI, the access date is not required and the DOI should be listed in place of the URL within the citation. A full DOI will have a prefix,
which is the number assigned to a particular organization, and a suffix, which is the numbers and/or letters that identify the individual document. The prefix and suffix are separated by a forward slash. DOIs should be included in citations as follows (unless otherwise specified by your chosen reference style):

<Full citation in your chosen style>DOI: 00.0000/XXX000000

2.3.5 Footnotes

Cite all sources used for (or presented as) footnotes in an appropriate References section at the end of the manuscript. Also apply this formatting if you have elected to list references at the end of each chapter. References should not be listed solely as footnotes, even if this is the convention of your chosen citation style.

2.3.6 Reproduced Tables, Figures, and Datasets

Reproductions, typically used in figures, tables, or appendices, must be centered within the margins of the page and must not exceed the defined page margins like all other figures, tables, and text. For more information on formatting tables and figures, see section 2.1.3 Figures and Tables.

2.3.6.1 Reproducing Copyrighted Tables and Figures

Material in most published books and journals is protected by copyright—even when the journal and book are accessible online. Therefore, before copyrighted material can be reproduced in the thesis, you must obtain written permission authorizing use of the material from the copyright holder. For many publishers, permission can be requested through their website. If this option is not available and you must write to the publisher for permission, OGE has a permissions request letter template [30] available. Ownership of the copyright can be determined by inspecting the copyright notice found on the backside of the title page.
For every reproduced item that required documented permission:

- Upload the permission with your ProQuest submission as a supplemental file—not just to the copyright permission section.

- Include a list of all uploaded permissions as an APPENDIX [8] at the end of your thesis. See section 3.2.2 for more information about including supplemental files and Appendix G for examples of correctly uploaded permissions and a correctly formatted permissions appendix.

If you have other supplemental files that are not permissions, these can be listed on the same list and in the same appendix as the listing of permissions documentation.

2.3.6.2 Datasets

When using a data set provided by another organization, they may have very specific information about how the use of the data set should be notated within your text. This generally does not comply with the standards of a student’s chosen citation style. If this is the case, the requested acknowledgement should be listed as a footnote where the data is first used or described within the document; the citation then listed in the reference section should conform to the standards of your chosen citation style.

2.3.7 Chapter Attribution

All previously published works (or excerpts of previously published work larger than you would cite for any other source) for which you are the/an author, when included in the thesis document, must be appropriately attributed exactly as shown in the examples below. The reference within the chapter attribution should be formatted according to your chosen citation style. Do not use quotation marks or number the attribution as a footnote. If you use footnotes in your work, be sure that the attribution is not counted in the numbering sequence. Since chapter

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8 Please refer to Appendix D Chapter Attributions for more examples of appropriate attribution.
attributions must contain a full reference the attribution is sufficient acknowledgement of the use of that text and the source does not need to be listed in the reference section as well, unless it is also used as a regular citation elsewhere in the thesis or dissertation. You can find a one-page guide to Appropriate Attribution on the OGE website [31].

1. If the entire chapter has been published previously, an attribution must be included at the bottom of the first page of the chapter which contains the pre-published material. This statement must read exactly as follows:

   This chapter previously appeared as: (formatted according to your chosen citation style)

2. If verbatim sections of previously published material are included in the chapter, an attribution must be included at the bottom of the first page of the chapter which contains this material. This statement must read exactly as follows:

   Portions of this chapter previously appeared as: (formatted according to your chosen citation style).

3. If the chapter is going to be published, an attribution should read exactly as follows:

   This chapter is ( Portions of this chapter are) to appear in: (formatted according to your chosen citation style)

   OR

   This chapter is ( Portions of this chapter are) in press: (formatted according to your chosen citation style).

4. If the chapter has been submitted for publication, an attribution should read exactly as follows:

   This chapter has ( Portions of this chapter have) been submitted to:
   (formatted according to your chosen citation style).

   Please note that all chapter attributions should be aligned to the left margin like the rest of your text; the attribution examples shown above are centered to distinguish them from the rest of the document text for clarity.
2.3.8 Attribution Acknowledgement

In addition to the use of in-text attributions, you must submit a Declaration of Co-contribution form [32] including an explanation of your intellectual and writing contribution to the previously published paper(s) you attribute in your thesis or dissertation. This form must be signed by both your advisor and yourself and submitted at the same time as the Record of Dissertation Exam or Record of Master’s Thesis and Oral Presentation and survey documents (see sections 3.1.1 Master’s Thesis and 3.1.3 Doctoral Dissertation).

As a reminder, to use a previously published, submitted, or in preparation work of which you are not the sole author, you must have made the primary intellectual and writing contribution to the work. An explanation for this contribution must be included for each of the papers to which you attribute parts of your thesis or dissertation. If you have not received permission from the publisher and the co-authors of the paper, you may not use it as an attribution. In that case, you may only use as much of the paper as you would for any other reference and you must cite it as such.

For guidance in describing their contribution, we ask that students see the Contributor Roles Taxonomy Project, CRediT [33] roles chart (see Table 2.5, below). Further instruction can be found on the Declaration of Co- Contribution form and the Permissions and Co-Contribution one-page guide [34].
Table 2.5: CRediT roles chart developed by the Contributor Roles Taxonomy Project [33]

<table>
<thead>
<tr>
<th>Contributor Role</th>
<th>Role Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptualization</td>
<td>Ideas; formulation or evolution of overarching research goals and aims.</td>
</tr>
<tr>
<td>Methodology</td>
<td>Development or design of methodology; creation of models.</td>
</tr>
<tr>
<td>Software</td>
<td>Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.</td>
</tr>
<tr>
<td>Validation</td>
<td>Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.</td>
</tr>
<tr>
<td>Formal Analysis</td>
<td>Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data.</td>
</tr>
<tr>
<td>Investigation</td>
<td>Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.</td>
</tr>
<tr>
<td>Resources</td>
<td>Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools</td>
</tr>
<tr>
<td>Data Curation</td>
<td>Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse.</td>
</tr>
<tr>
<td>Writing – Original Draft Preparation</td>
<td>Creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).</td>
</tr>
<tr>
<td>Writing – Review &amp; Editing</td>
<td>Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.</td>
</tr>
<tr>
<td>Visualization</td>
<td>Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.</td>
</tr>
<tr>
<td>Supervision</td>
<td>Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.</td>
</tr>
<tr>
<td>Project Administration</td>
<td>Management and coordination responsibility for the research activity planning and execution.</td>
</tr>
</tbody>
</table>
2.4 Other Resources Available

2.4.1 Suggested Typesetting Software

We suggest that you format your thesis or dissertation using the latest version of Microsoft Word or LaTeX, since they are used most commonly and support is more widely available. LaTeX is particularly well-suited to formatting a long and complex document with tables of contents, cross-references, tables, and figures. It also produces very high-quality mathematical expressions. The Division of the Chief Information Officer website[35] provides templates for both LaTeX and Word that satisfy most of the Office of Graduate Education’s requirements. Please keep in mind that this is a basic template that was not created and is not maintained by OGE and further formatting and editing may be necessary to comply with updated standards.

The instructions for using these templates[35] contain detailed information on preparing your thesis or dissertation. As an alternative to LaTeX or Microsoft Word, Open Office is available at the Open Office website[36]. If you choose Open Office, or any typesetting software other than Word or LaTeX, to produce your thesis or dissertation, you will need to create your own template using the specifications listed and the sample pages shown in this manual. While these templates may help to compile and organize references, students cannot consider them citation styles.

2.4.2 The Center for Global Communication+Design (CommD)

CommD[37], located on the lower level of Folsom Library, offers all Rensselaer students assistance with any type of writing and with oral presentations. You are encouraged to come with an early draft of your manuscript or presentation. CommD provides an instructional, not an editorial, service. That is, the staff responds to writers’ work, helping them become more aware of the strengths of their text and teaching them how to edit their own work. If you need extra help with written English, you should bring small sections of early drafts; the staff will do their best to
help you learn to recognize and correct errors. You may also bring later drafts to consult with CommD staff about clarity and style. This should be done as early as possible. CommD staff can also advise you about courses in writing offered at Rensselaer to help further strengthen your writing and editing skills.

2.4.3 Preliminary Reviews

OGE can also review and provide one-time feedback on the formatting of your dissertation prior to your official submission with a preliminary review. This should be done before your defense and as early in the semester as possible. OGE accepts dissertations and theses for preliminary review prior to the student’s defense and up to one week before the official Master’s thesis submission deadline.9

This is a great opportunity to come in and discuss any formatting questions you have with someone from OGE in person, if you choose. In person reviews are done by appointment only. If you are not in the area or able to come to OGE, preliminary reviews can also be done via email, much like the official review process. Like CommD, OGE does not provide an editing service; but we can guide you to recognize formatting and citation errors and help you to understand OGE formatting requirements. For most students, preliminary reviews help to cut down on the number of rounds of revisions during the official review process but they are not intended to be as thorough.

Preliminary reviews do not exempt students from the official review process. For further information please contact OGE between 8:30am and 5:00pm, Monday through Friday at 518-276-6488 and ask to speak with the Point of Contact (POC) for your department or contact your department’s POC via email [1].

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9 This is subject to change at OGE discretion based on the timing and volume of submissions.
3. THE SUBMISSION PROCESS

OGE approves the submission of the dissertation or theses as a requirement for degree completion. After passing the final examination (defense or oral presentation) and no later than the published submission due date, you must submit the supporting paper work (listed in section 3.1 Supporting Paperwork of this manual) to OGE and a PDF of your committee-approved thesis to ProQuest ETD Administrator [7]. After all required documents have been submitted, OGE will review your thesis or dissertation to ensure all requirements have been met before the Dean of Graduate Education approves your manuscript and the Registrar’s Office is informed of your completion. Once finalized by the Registrar’s Office, ProQuest and the Library are notified that your thesis or dissertation can be released.

Please note that your department may require copies of your thesis – please be aware that their submission requirements are separate from those of OGE. If you need additional copies bound for your department, you must make these arrangements individually (refer to section 3.3 Copies and Publishing).

3.1 Supporting Paperwork

3.1.1 Master’s Thesis

Master’s candidates must submit their thesis to the advisor and advisory committee for review at least two weeks before the final copy is due in the Office of Graduate Education. For due dates, check the academic calendar [3].

Bring the following items to OGE in paper form, no later than the published submission due date in the academic calendar (these items are separate from, but in addition to, the electronic submission of your thesis). A delay in OGE receiving any one of these items will delay the dissertation review process.
1. The Record of Master’s Thesis & Oral Presentation Form [38] with the original signatures of your advisor and committee. We cannot accept scans of this form, digital signatures, or stamped signatures. This form should be submitted to OGE within 1-2 business days following the date of the final committee member’s signature. If the master’s committee requires revisions to the thesis following the defense, this form should not be signed until those revisions are completed and approved by the committee. **Ideally, all committee members should wait to sign until final approval. If this is not possible, the committee chair should sign only after their final approval as representative of the committee.**

2. The Graduate Student Exit Survey, available on the OGE website [39]. Please note that this survey is now in an online format. You do not need to print and submit a paper copy of your answers to OGE. Instead, you must submit the completion confirmation page that is generated upon completion of the survey. The page will include your name and the date when the survey was completed.

3. Declaration of Co- Contribution and Reprint Permission Letters, if required.

4. Third party software licenses, if required.

We also ask that you complete the Future Plans Survey [40] through the Center for Career and Professional Development [41]. We have many employers who request compensation guidelines for graduates. So, this data can help strengthen salary offers for students. There is no paper form for this survey.

Note: It is highly recommended that these items along with your uploaded thesis be submitted well in advance of the submission due date to allow time for corrections if necessary.

3.1.2 Master’s Project

Master’s candidates who will be completing a project instead of a thesis to satisfy the requirements of their degree are not required to submit their project reports to the Office of Graduate Education. The project report is submitted to the advisor for review and the final grade
is assigned accordingly. If a Master’s candidate chooses to submit a project report to OGE, they must follow the same guidelines shown above for a Master’s thesis in 3.1.1 Master’s Thesis.

### 3.1.3 Doctoral Dissertation

Doctoral candidates must submit a copy of their dissertation in its final form along with a copy of the abstract to their dissertation advisor at least one month before the end of the term in which it is expected that the degree will be awarded. You must provide each doctoral committee member with an individual copy of the dissertation at least one week before the dissertation defense; this may vary based on department, please consult your advisor for more information. For due dates specific to your intended semester of graduation, check the academic calendar [3].

Bring the following items to the Office of Graduate Education in paper form, no later than the published submission due date (these items are separate from, but in addition to, the electronic submission of your dissertation). A delay in OGE receiving any one of these items may delay the dissertation review process.

1. The Record of Dissertation Exam Form [42] with the original signatures of your Advisor and the doctoral committee. We cannot accept scans of this form, digital signatures, or stamped signatures.\(^\text{11}\) This form should be submitted to OGE within 1-2 business days following the date of the final committee member’s signature. If the doctoral committee requires revisions to the dissertation following the defense, this form should not be signed until those revisions are completed and approved by the committee. **Ideally, all committee members should wait to sign until final approval. If this is not possible, the committee chair should sign only after their final approval as representative of the committee.**

2. Survey of Earned Doctorates Completion Certificate. This is a national survey administered by the National Science Foundation [43].

\(^{11}\) ALL signatures on this form must be original, including those of committee members from outside of Rensselaer. If your outside member is not able to be physically present at your defense, their signature must still appear on the form. OGE suggests priority mailing the form to your out of town member. Students should plan accordingly for the timing of mailing and receiving the signed form.
3. The Graduate Student Exit Survey, available on the OGE website [39]. Please note that this survey is now in an online format. You do not need to print and submit a paper copy of your answers to OGE. Instead, you must submit the completion confirmation page that is generated upon completion of the survey. The page will include your name and the date when the survey was completed.

4. Declaration of Co-Contribition and Reprint Permission Letters, if required.

5. Third party software licenses, if required.

We ask that you also complete the Future Plans Survey [40] through the Center for Career and Professional Development [41]. We have many employers who request compensation guidelines for PhD graduates. So, this data can help strengthen salary offers for students. There is no paper form for this survey.

Note: It is highly recommended that these items along with your uploaded dissertation be submitted well in advance of the submission due date to allow time for corrections if necessary.

3.2 Electronic Submission Via ProQuest ETD Administrator

3.2.1 How and When to Submit

You must bring the approved Record of Dissertation Exam/Record of Master’s Thesis & Oral Presentation and the supporting paper work to OGE before submitting your thesis or dissertation to ProQuest ETD Administrator for review.

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Note: Supplemental files must be listed and described in an appendix of the thesis and identified by name, file type, size, required application software, and any special hardware requirements.
Supplemental files may have value independent of the text, for example: a complete musical performance, a video work, or a dataset. Examples of possible file types include spreadsheets, flash, and video files. If preapproved by your thesis or dissertation committee, you may submit one or more supplemental files which must be listed in an appendix of your manuscript. Currently accepted file types are listed below. If you have a file type that is not in the list, please contact ETD Support [44].

Table 3.1: Accepted supplemental file types for electronic submission [8]

<table>
<thead>
<tr>
<th>Images:</th>
<th>Audio:</th>
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<tr>
<td>.gif (GIF)</td>
<td>CD-DA, CD-Rom/XA</td>
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<td>.jpg (JPEG)</td>
<td>.midi (for electronic instruments)</td>
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<td>.tif (TIFF)</td>
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</table>

File formats marked with an asterisk (*) are proprietary.

Note: If the total size of your thesis and supplemental files is greater than 1000 MB, please contact Rensselaer’s ETD Support services [42] for more information.
3.2.3 File Conversions for Electronic Submission

You must submit your thesis through ProQuest ETD Administrator in PDF format. The PDF files you submit to ProQuest ETD Administrator must have all fonts embedded and must be text searchable.

If you prepare your thesis in LaTeX, there are straightforward (and free) methods of conversion to PDF. See Creating a PDF File from a LaTeX Thesis [45] for detailed instructions.

If you use Word, a current version of the Adobe Acrobat program (e.g. as of 2015-16 versions 11.0 or DC are current) is the recommended method for conversion. For detailed instructions, see Creating a PDF File from a Microsoft Word Thesis [46]. You can obtain Acrobat Pro from the Campus Computer Store.

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Copyrights protect the original written document representing all the work that you’ve put a great amount of time and effort into conducting throughout your graduate program at Rensselaer. If you are unsure whether or not you would like to file for a copyright on your work, ProQuest provides helpful information regarding copyright laws, rights, and responsibilities that may help you to decide if copyrighting your work is the right choice for you [47]. Your advisor may also be able to help you make decisions about your copyright choices.

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3.3.2 Publishing Conflicts

Electronic submission or publication of a doctoral dissertation does not affect its publication in whole or in part as a book or in a journal. You are strongly encouraged to seek conventional publication in a recognized technical or scientific journal. Consult your thesis or dissertation advisor for assistance.

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notify the Library to release your thesis/dissertation. You will then receive the personal copies of your dissertation that were ordered at the time of submission.

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1. You may purchase personal bound copies through ProQuest ETD Administrator when you submit your thesis. If you order copies this way, and did not delay the release of your thesis/dissertation, you will receive them by mail 8 to 12 weeks after the end of your graduation semester.

2. The Rensselaer Collegiate Store [48] will arrange to bind personal copies of your thesis at contracted rates. This may be less expensive than ordering bound copies through ProQuest ETD Administrator. You will need to print your thesis yourself to have it bound by the Rensselaer Collegiate Store. If you are interested, please contact the Collegiate Store directly.

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All supporting paperwork and ProQuest ETD submissions must be made by close of business (5:00 PM) on the posted deadline date. Any submission made after this time may not be accepted by OGE for review for that semester and you may have to postpone your graduation until the following semester. In the event of extenuating circumstances, submission extensions may be granted on a case-by-case basis.

For the greatest chance of approval, any requests for an extension should be made as early as possible during the semester in which you intend to graduate. All requests must be made to

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12 All deadlines are listed in the Academic Calendar [3].
OG by your Graduate Program Director before the posted deadline date for your degree program (i.e. the Master’s Deadline or PhD Deadline). If you attempt to request an extension after the submission deadline for your degree program has passed, it will be denied by OGE and you will have to wait until the following semester to submit.

3.5 The Review Process

The OGE review process is designed to ensure all graduate students’ dissertations and theses uphold the academic integrity and formatting standards established at Rensselaer. This is not a one-time submission that is either approved or rejected, rather it is a process to help ensure consistency among all dissertations and theses that are written by Rensselaer graduate students. The expectation of consistency and standardization is similar to that of the submission process for publications in any journal. However, unlike the review process for journal publication, OGE does not assess the substantive content of your work.

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the entire document for errors or discrepancies in formatting and citations. A list of necessary revisions is then emailed to you through ProQuest. We ask that revisions be resubmitted within 48 hours to help ensure the review process is completed before the deadline set by the registrar (this is the deadline by which all degree requirements must be completed in order for a student to graduate). Most students will go through a few rounds of revisions before their thesis or dissertation can be forwarded to the Dean for final review. The signed approval of the Dean is necessary for the fulfillment of the thesis/dissertation requirement for all graduate students.
4. ACADEMIC INTEGRITY

Rensselaer values academic integrity and considers plagiarism a very serious offense; it is important to treat it as such. All graduate students have a responsibility to understand and to uphold the standards of the academic community. Without a commitment from all members of the community to work honestly and fairly, intellectual inquiry would suffer. A high standard of honesty and integrity is expected of you—as a student, as a researcher, and as a teacher [49].

When you submit your thesis or dissertation to OGE for official review, we will conduct academic integrity checks throughout the Body of your thesis or dissertation. This is to ensure that you have not taken verbatim text from any other sources without the proper citation; taking verbatim text from a source without proper citation is either plagiarism or self-plagiarism. Both forms of plagiarism are discussed later in this chapter.

If OGE finds a potential case of plagiarism, we will follow the procedures outlined in the Graduate Student Supplement to the Handbook of Rights and Responsibilities [50]. Questions or concerns about appropriately citing your work or the work of others should be brought to the attention of your advisor, graduate program director, or point of contact in OGE before review.

4.1 Plagiarism

Plagiarism is representing the work or words of another as one’s own through the omission of acknowledgment or reference. For example, using sentences verbatim from a published source in a term paper without appropriate referencing, presenting the detailed argument of a published source as one’s own, or presenting electronically or digitally enhanced graphic representations from any form of media as one’s own are all forms of plagiarism [51].

If you are referencing someone else’s work, it must be cited appropriately in the Body and Reference section of your thesis or dissertation according to the guidelines provided in your chosen
citation style guide. Exact phrases, words, or passages from another source need to be quoted, or appropriately cited according to your citation style guide. For example, if you are describing an experiment that someone else conducted, you must give appropriate credit to the investigator by using citations. If the work is not cited, you misrepresent the experiment as being your own work, or use verbatim text from that investigator without adequate quotation notation, it is considered plagiarism. There are many different forms of plagiarism [52], [53]; all forms jeopardize the integrity of your work and are taken very seriously at Rensselaer.

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Using your own previously published work verbatim without indicating via chapter attributions that you are doing so, is self-plagiarism. Any work previously published, submitted for publication, or presented, including excerpts of previously published, submitted, or presented works for which the student is the author or co-author, must be appropriately attributed when included in the thesis document. See section 2.3.7 Chapter Attribution for further information on formatting an appropriate attribution.

4.3 Using Copyrighted Materials

In the event that written permission must be obtained for the reproduction of copyrighted material within your thesis or dissertation, the permission letter should be included as a supplementary file with your ProQuest submission. The supplementary file should be listed and described in the Appendices of your dissertation. For further information about the use of supplementary files, please see section 3.4.2.

“Did I Plagiarize?”

The Types and Severity of Plagiarism Violations. [52]
REFERENCES


APPENDICES

This section includes sample pages from recent Rensselaer Master’s theses and PhD dissertations to illustrate the exact formatting requirements and specific guidelines expected for the various components of your manuscript. The following sample pages or sections are presented to offer further guidance in the formatting of your dissertation or thesis. 13

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13 Please note that on a number of the sample pages shown in this section, two page numbers are included on the bottom center of the same page. In these cases, the page number printed “on top” is the page number which is intended to be used in the thesis or dissertation; the page number “below” represents the sequential page number within this manual.
Appendix A Sample Title Pages

Title Pages should appear exactly as they do in the following examples. No page number should appear on the title page but it should be considered “i.” The page number listed here is in the context of the manual.

A.1 Sample of Master’s Thesis or Project Title Page

**TITLE OF THESIS IN ALL CAPS**

Name of Author

Submitted in Partial Fulfillment of the Requirements for the Degree of

**MASTER OF SCIENCE**

Approved by:
Committee Member, Chair
Committee Member
Committee Member

Based on your degree program.

Department of **Department Name**
Rensselaer Polytechnic Institute
Troy, New York

[Month Year]
Submitted Month Year

The graduation month should correspond to the semester in which you plan to graduate (i.e. May, August, or December).

The month provided should be the month in which the thesis is officially submitted to OGE (not when you submit to your committee).
SAMPLE COMPUTER SCIENCE
THESIS TITLE PAGE

Graduate Student Services

Submitted in Partial Fulfillment of the Requirements
for the Degree of

MASTER OF SCIENCE

Approved by:
Dr. Chuck Stewart, Chair
Dr. Sibel Adali
Dr. Barbara Cutler

Department of Computer Science
Rensselaer Polytechnic Institute
Troy, New York

[May 2018]
Submitted April 2018

Figure A.1: Sample of a Master’s thesis Title Page
A.2 Sample of Doctoral Dissertation Title Page

TITLE OF DISSERTATION IN ALL CAPS

Name of Author

Submitted in Partial Fulfillment of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

Approved by:
Committee Member, Chair
Committee Member
Committee Member
Committee Member

Extra Committee member(s)
for PhD students.

Based on your degree program.

Department of Department Name
Rensselaer Polytechnic Institute
Troy, New York

[Month Year]
Submitted Month Year

53
A SAMPLE BIOLOGY DOCTORAL DISSERTATION TITLE PAGE

Graduate Student Services

Submitted in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

Approved by:
Dr. Susan Gilbert, Chair
Dr. Lee Ligon
Dr. Blanca Barquera
Dr. Stanley Dunn

Department of Biological Sciences
Rensselaer Polytechnic Institute
Troy, New York

[May 2018]
Submitted April 2018

Figure A.2: Sample of a dissertation Title Page
Appendix B Sample Copyright Page

1. Year of Publication.

© Copyright 1685

By

Isaac Newton

All Rights Reserved

2. Copyright symbol and/or the word

If you have a copyright notice, it is always page “ii”

3. Your name.

ii
Appendix C Sample Contents Page

C.1 Sample Table of Contents

CONTENTS

TITLE PAGE ........................................................................................................... i
LIST OF TABLES ..................................................................................................... v
LIST OF FIGURES ................................................................................................. vi
ACKNOWLEDGEMENTS ....................................................................................... vii
ABSTRACT ............................................................................................................... viii
1. INTRODUCTION ............................................................................................... 1
   1.1 This is a Section Heading ............................................................................. 4
      1.1.1 This is a Subsection Heading ............................................................. 4
      1.1.1.1 This is a Sub-subsection Heading ............................................. 4
      1.1.2 This is a Subsection Heading ........................................................... 5
      1.1.3 This is a Subsection Heading ........................................................... 5
   2. CHAPTER 2 TITLE ......................................................................................... 7
      2.1 This is a Section Heading ........................................................................ 7
         2.1.1 This is a Subsection Heading ......................................................... 8
         2.1.2 This is a Subsection Heading ......................................................... 11
      2.2 This is a section heading ......................................................................... 17
REFERENCES ....................................................................................................... 21
APPENDICES ......................................................................................................... 23
   A. THIS IS AN APPENDIX .............................................................................. 24
      A.1 Subsection Heading ............................................................................. 24
   B. THIS IS ANOTHER APPENDIX .............................................................. 25

Front matter listed with Roman numeral page numbers. The introduction (body) starts on page 1.

Spacing between listings should be consistent.

Make sure your capitalization is consistent for your section and subsection headings.

Page numbers right aligned.
C.2 Sample List of Tables

LIST OF TABLES

Table 1.1 This is the Caption for Table 1 ................................................................. 1
Table 1.2 This is the Caption for Table 2 ................................................................. 2
Table 1.3 This is the Caption for Table 3 ................................................................. 3
Table 1.4 This is the Caption for Yet Another Table ............................................... 4
Table 1.5 This is the Caption for Another Table with a Caption that is Much Longer and Will Run Onto Two Lines ........................................................................... 5
Table 1.6 This is the Caption for A Final Table ........................................................ 4

Captions should appear exactly as they do above the tables in the body of the dissertation/thesis.

Page numbers must be right aligned.

Make sure your captions don't run over into the number column on your lists. (This includes headings in your Table of Contents).

The List of Tables is part of your front matter and should have a Roman numeral page number.
C.3 Sample List of Figures

LIST OF FIGURES

Figure 1.1 This is the First Figure .................................................................1
Figure 1.2 Another Figure ........................................................................2
Figure 1.3 The Caption for Another Figure .............................................3
Figure 1.4 The Last Figure ......................................................................4

The formatting for your List of Figures should be the same as your List of Tables. Don't forget to make sure that the captions listed match those under each figure exactly.
CONTENTS

LIST OF TABLES ........................................ vi
LIST OF FIGURES ....................................... vii
ACKNOWLEDGMENT ....................................... x
ABSTRACT ............................................... xi

1. INTRODUCTION AND CONTRIBUTIONS .............. 1
   1.1 Contributions .................................... 2
   1.1.1 Parallel Unstructured Mesh Based Workflows .... 2
   1.1.2 In-memory Component Coupling .................. 2
   1.1.3 Dynamic Partition Improvement ................. 2
   1.2 Thesis Organization ............................. 3
   1.3 Terminology and Notation ....................... 4

2. CONSTRUCTING PARALLEL ADAPTIVE WORKFLOWS .... 6
   2.1 Introduction ..................................... 6
   2.2 The Current State-of-the-Art .................... 6
   2.3 Approach to Eliminating Technical Impediments ... 8
   2.3.1 Workforce Development ....................... 10
   2.4 Component Interactions .......................... 11
   2.4.1 Component Interfaces ........................ 13
   2.4.2 Data Streams ................................. 14
   2.5 Components for 3D Unstructured Mesh-based Workflows ... 14
   2.5.1 Geometric Model Definition and Interrogation ... 15
   2.5.2 Mesh Generation ................................ 19
   2.5.3 Mesh Adaptation ................................ 19
   2.5.4 Mesh Data Structures .......................... 21
   2.5.5 Partitioning and Load Balancing ............... 22
   2.5.5.1 (Hyper)Graph Partitioning .................. 22
   2.5.5.2 Geometric Partitioning ..................... 23
   2.5.5.3 Diffusive Partitioning ..................... 24
3. IMPROVING UNSTRUCTURED MESH PARTITIONS FOR MULTIPLE CRITERIA USING MESH ADJACENCIES

3.1 Introduction ............................................ 25
3.2 Dynamic Partitioning Requirements .................. 26
3.3 Partitioned Mesh Representation ...................... 27
3.4 Partition Improvement .................................. 28
3.5 Targeting .............................................. 29
3.6 Entity Selection ....................................... 31
    3.6.1 Part-level Graph Distance Heuristic .............. 32
    3.6.2 Entity-level Cavity Heuristics .................. 35
    3.6.3 Stagnation Avoidance ............................ 41
    3.6.4 Time Complexity ................................... 41
3.7 Results ............................................... 42
    3.7.1 LIIPBMod Comparison ............................ 42
    3.7.2 Feature Tests .................................... 44
    3.7.3 Multi Criteria Improvement ..................... 46
    3.7.4 Partitioning to over one million parts .......... 49
    3.7.5 CFD Scaling Improvement ......................... 50

4. IN-MEMORY INTEGRATION OF EXISTING SOFTWARE COMPONENTS FOR PARALLEL ADAPTIVE UNSTRUCTURED MESH WORKFLOWS

4.1 Introduction ............................................ 54
4.2 PHASTA ............................................. 55
    4.2.1 POSIX and Data Stream Performance Test ........ 58
4.3 Albany Solderball .................................... 63
4.4 Omega3P Cavity Frequency Analysis .................. 67

5. WORKFLOWS DEVELOPED FOR THE NEW YORK STATE HIGH PERFORMANCE COMPUTING CONSORTIUM

5.1 Semi-automated Pump Design .......................... 74
5.2 Micromechanical Device Analysis ..................... 78
5.3 High-fidelity Viscous Flow Simulation ................. 79
    5.3.0.1 Science Gateway ............................. 81
6. CONCLUSIONS AND FUTURE WORK ......................... 85
   6.1 Conclusions ........................................ 85
   6.2 Future Work ......................................... 86
       6.2.1 Partitioning and Load Balancing .......... 86
       6.2.2 Unstructured Mesh-Based Workflows ...... 86
REFERENCES .................................................. 88

APPENDICES

A. IN-MEMORY EXAMPLE CODE ................................ 103

Figure C.1: Sample of a Table of Contents page from a student’s dissertation [54]
LIST OF TABLES

3.1 Diffusion iterations and run time for various $\alpha$ settings. .......... 31
3.2 Reduction in number of mesh entities classified on $P^2$ for cavities (a-f) depicted in Figure 3.6. ........................................... 37
3.3 Existence of Figure 3.7 cavity edges on parts. The column groups list the edge existence prior to migration of the cavity, Owner=0, and after migration to part N, Owner=N. An entry is ‘1’ if the edge exists on the part. The last row lists the total number of cavity edges on each part. .......................................................... 40
3.4 ParMA test configurations. .................................................. 44
3.5 vertex=element partition improvement on a 2.3 million element, 2048 part, mesh of the RPI Formula Hybrid suspension upright of Figure 3.2. .................. 49
3.6 Initial meshes for upright tests. ........................................... 50
3.7 X+ParMA vertex > element upright test results. ................. 51
4.1 Per-node main memory and filesystem peak bandwidth over five generations of Argonne National Laboratory systems. The values in parentheses indicate the increase relative to the previous generation system. 55

Figure C.2: Sample of a List of Tables page from a student’s dissertation [54]
LIST OF FIGURES

2.1 Components for parallel, adaptive, mesh-based simulation workflows. 15
2.2 (left) A simple geometric model and (right) a mesh classified on it [5]. 16
2.3 Mesh adaptation’s use of a positional geometric model query to place a new mesh vertex on a geometric model edge [47]. 17
2.4 The mesh of a 2D slice through the segmented Digimouse created using Simmetrix GeomSim. The location of light emitters and detectors are shown with black and grey arrows, respectively [53]. 18
2.5 Geometric model and mesh of the Landers fault system for SeisSol dynamic rupture earthquake simulations [54,55]. 18
3.1 Example of a mesh (left), its partition model (middle), and its ownership (right). Discs and bold segments denote entity ownership. 28
3.2 Coarse mesh of the 2014 RPI Formula Hybrid suspension upright. 30
3.3 Effects of $\alpha$ on the number of iterations, run time, and vertex imbalance. The initial mesh has 2048 parts and a 46% vertex imbalance. 31
3.4 Detecting non-manifold component boundaries. 35
3.5 Components in one of four parts of the MPAS 60km ocean. 36
3.6 Vertex bounded cavities being migrated from part 0 to 1. 38
3.7 Counting mesh entity partition model classification to select either part one or part two for the migration of part zero cavity elements. The cavity bounding vertex is marked with a disc. Part classification is shown in the left figure; faces in the foreground classified on part 2 are not shaded. Mesh edges are labeled in the right figure (for clarity, edges in the foreground have bold labels). 40
3.8 Abdominal aortic aneurysm (AAA) geometric model and close-up view of a coarse mesh. 43
3.9 Evolution of the vertex (left) and element (right) imbalance with ParMA, LIIPBMod, and ParMETIS in the 941 million element AAA mesh. 43
3.10 Partition quality of a 1,024 part MPAS North America 15km to 75km graded ocean mesh using the ParMA configurations listed in Table 3.4. 47

Figure C.3: Sample of a List of Figures page from a student’s dissertation [54]
Appendix D Chapter Attributions

D.1 Sample of an Appropriate In-Text Attribution

CHAPTER 1

1.1 Introduction

If one or more of your chapters are from work—in whole or in part—that has been or will be published in another form, you must attribute it. A chapter attribution should be listed in the footer of the first page of the chapter in which the previously published/to be published work appears. This is in addition to the attribution acknowledgement in the front matter.

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CHAPTER 3
IMPROVING UNSTRUCTURED MESH PARTITIONS
FOR MULTIPLE CRITERIA USING MESH
ADJACENCIES

3.1 Introduction
Parallel simulation-based engineering workflows using unstructured meshes require adaptive methods to ensure reliability and efficiency [1]. Starting with a problem specification on a geometric model [37,111], an effective workflow automatically executes parallel mesh generation [112], analysis, and analysis-based mesh [2, 3] and/or model [113] adaptation. The analyze-adapt cycle is repeated until a desired level of solution accuracy is reached. Between each step in the cycle is an opportunity to improve scalability and efficiency through dynamic partitioning.

Current dynamic load balancing methods do not effectively reduce imbalances to the levels needed by applications capable of strong scaling to the full size of leadership class peta-scale systems. This chapter presents a scalable approach that quickly reaches the required imbalance levels for multiple criteria by pairing ParMA, Partitioning using Mesh Adjacencies, with current partitioning methods.

A review of (hyper)graph, recursive sectioning geometric, and diffusive partitioning methods is located in Section 2.5.5. Section 3.2 introduces the dynamic partitioning problem and how our approach meets the requirements to solve it effectively. Section 3.3 reviews the partitioned mesh representation in the Parallel Unstructured Mesh Infrastructure (PUMI) [6, 114]. Sections 3.4 through 3.6 detail partition improvement procedures to support application specific partition requirements. Section 3.7 begins with a comparison of ParMA and its predecessor, LIIPMod. Next, we present a ParMA feature comparison test and multi-criteria partitioning results on meshes with over 12 billion elements running on over one

Figures: D.1: Sample of an attribution of a work previously submitted for publication in a student’s dissertation [54]
Appendix E Uploading Permission Files (and Other Supplementary Files)

Figure E.1: Screenshot of uploaded supplementary files on ProQuest [55]
APPENDIX B
SUPPLEMENTAL FILES

B.1 Permissions for Section 4.3

This file contains license details and terms and conditions for the reproduction of material used in Section 4.3 of this dissertation.

File type: Portable Document Format (PDF)
File size: 174 KB

Required application software: Adobe Acrobat or any standard PDF viewer
Special hardware requirements: None

B.2 Permissions for Section 4.4

This file contains license details and the terms and conditions for the reproduction of material used in Section 4.4 of this dissertation.

File type: Portable Document Format (PDF)
File size: 192 KB

Required application software: Adobe Acrobat or any standard PDF viewer
Special hardware requirements: None

Figure E.2: Sample of a student's list of supplementary files, including permission files [55]
Appendix F Captions

F.1 Sample of a Figure and Figure Caption

If you choose to reproduce a figure in your work that you did not create, you must receive permission from the original publisher and the figure must be cited accordingly. The caption below the figure should appear exactly in the list of figures as it does in the body of your work. This includes the correct citation.

Find x.

Don't forget the delimiter!

Don't forget to include the reference when listing the caption on your List of Figures!
Figure 2.4: Convergence of the phantom solution with optimal regularization parameter.

Figure 2.5: Transverse section of an equine bronchus. (a) OCT image in dB. M: mucosa, ASM: airway smooth muscle, and C: cartilage; (b) local displacement from micro-scale actuation; (c) axial strain, where $\mu$ is milli-strain; and (d) shear modulus image, reconstructed by solving the elasticity inverse problem. The scale bar represents 500 $\mu$m. Red dashed lines represent the layer-tissue boundary.

calculated as the gradient of axial displacement in depth [56], which constitutes a standard elastogram that would be produced by compression OCE [57]. Although we can identify the presence of the inclusion in the strain alone, it is evident that its relation to the stiffness of the material is distorted by the effects of material property heterogeneities, particularly apparent at the boundaries of the inclusion.

The axial component of the displacement data, Fig. 2.2(b), was used to infer the spatial distribution of the shear modulus using the method described in Sec-

Figure F.2: Sample of a figure and figure caption from a student’s dissertation [57]
of Argonne National Laboratory leadership class systems: Blue Gene/L [137, 138], Intrepid Blue Gene/P [139, 140], Mira Blue Gene/Q [132, 141], Theta [142, 143], and 2018’s Aurora [144]. Based on these peak values the bandwidth gap between main memory and the filesystem is at least three orders of magnitude. Software must leverage the cache and main memory bandwidth performance advantage during as many workflow operations as possible to maximize performance.

Table 4.1: Per-node main memory and filesystem peak bandwidth over five generations of Argonne National Laboratory systems. The values in parentheses indicate the increase relative to the previous generation system.

<table>
<thead>
<tr>
<th></th>
<th>Memory BW (GiB/s)</th>
<th>Filesystem BW (GiB/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BG/L</td>
<td>5.6</td>
<td>0.0039</td>
</tr>
<tr>
<td>BG/P</td>
<td>14 (2.4x)</td>
<td>0.0014 (0.36x)</td>
</tr>
<tr>
<td>BG/Q</td>
<td>43 (3.1x)</td>
<td>0.0049 (3.5x)</td>
</tr>
<tr>
<td>Theta</td>
<td>450 (11x)</td>
<td>0.058 (12x)</td>
</tr>
<tr>
<td>Aurora</td>
<td>600 (1.3x)</td>
<td>0.020 (0.34x)</td>
</tr>
</tbody>
</table>

This chapter presents the use of in-memory component coupling techniques that avoid filesystem use for three different unstructured mesh-based parallel adaptive workflows. These demonstrations highlight the need for in-memory coupling techniques that are compatible with the design and execution of the analysis software involved. Key to this compatibility is supporting two interaction modes: bulk and atomic information transfers.

4.2 PHASTA

PHASTA solves complex fluid flow problems [130, 145-148] on up to 768 Ki cores with 3 Mi (3*2^9) MPI processes [9] using a stabilized finite element method [129] primarily implemented with FORTRAN77 and FORTRAN90. Support for mesh adaptivity, dynamic load balancing, and reordering has previously been provided by the C++ PUMI-based component, chef, through file I/O. This file-based coupling uses a format and procedures that were originally developed over a decade ago. Our work adds support for PHASTA and chef data stream based adaptivity. We show

Figure F.3: Sample of a table and table caption from a student’s dissertation [54]
Appendix G Formatting Examples for Common Problems

G.1 Sample Formatting of an Equation

Like figures and tables, equations should be centered, not set within the text. Equation numbers must be used for each equation to identify them. The identifying numbers should be listed parenthetically and right aligned next to the equation. While some students do choose a list of equations in the front matter of their thesis or dissertation, it is not required. If a List of Equations is included, the equations should be listed exactly as they appear in the body—like the titles and captions for tables and figures.

\[ E = mc^2 \] (1)

\[(1 + x)^n = 1 + \frac{n x}{1!} + \frac{n(n-1)x^2}{2!} + \ldots \] (2)

\[ f(x) = a_0 + \sum_{n=1}^{\infty} \left( a_n \cos \frac{n\pi x}{L} + b_n \sin \frac{n\pi x}{L} \right) \] (3)

Some students choose to number their equations consecutively throughout their entire document. Others choose to number them by chapter. If you choose to number them by chapter, you must include a chapter designation (i.e. 1.1, 2.1, 3.1, etc.), as the student has done in figure F.1, so that there will not be multiple equations with the same number in your thesis or dissertation.
G.2 Sample Equations from Student’s Work

\[ \gamma_{p,q} = H(x)_{p,q}(k_{r} \omega) \quad \gamma_{p,q} = \theta_{p,q} H_{q}(k_{r} \omega). \]  

(4.19)

By satisfying all four interface conditions, the dispersion relation is found to be

\[ G_{1} \left( \frac{J_{1}(k_{r} r_{1})}{\frac{J_{1}(k_{r} r_{1})}{H_{q}(k_{r} r_{2})}} \right) = G_{2} \left( \frac{H_{q}(k_{r} r_{2})}{H_{q}(k_{r} r_{2})} \right), \]  

(4.20)

\[ G_{1} (x) = \frac{H_{q}(k_{r} r_{2})}{H_{q}(k_{r} r_{2})}. \]  

(4.21)

For comparison, the dispersion relation of the idealized front model is

\[ \frac{k_{r_{1}} J_{1}(k_{r} r_{1})}{k_{r_{2}} J_{1}(k_{r} r_{1})} = \frac{H_{q}(k_{r} r_{2})}{H_{q}(k_{r} r_{2})}. \]  

(4.22)

The solutions to Eq. (4.20) are horizontal wavenumbers $k_{n,m}$ which are eigenvalues of the radial modes, with $m$ being the radial mode number. As with $n$, $m$ will be suppressed for convenience.

A more numerically convenient form of the dispersion relation is found by following the method outlined in Ref. 5:

\[ R = -D \frac{B_{11} - E B_{13}}{1 - E B_{13} B_{21}} F = 1, \]  

(4.23)

where

\[ B_{34} = \frac{k_{r_{1}} J_{1}(k_{r} r_{1})}{k_{r_{1}} J_{1}(k_{r} r_{1})} - \frac{k_{r_{2}} J_{1}(k_{r} r_{2})}{k_{r_{2}} J_{1}(k_{r} r_{2})}, \]  

(4.24)

\[ D = \frac{H_{q}(k_{r} r_{2})}{H_{q}(k_{r} r_{2})}. \]  

(4.25)

The quantity $F$ is given by

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Figure G.1: Sample of multiple types of equations from a student’s dissertation [58]
### G.3 Sample of a Landscape-Oriented Page

<table>
<thead>
<tr>
<th>Field 1</th>
<th>Field 2</th>
<th>Field 3</th>
<th>Field 4</th>
<th>Field 5</th>
</tr>
</thead>
</table>

Table G.1: Sample landscape-oriented table caption
G.4 Sample Landscape Oriented Pages from Students’ Work

Figure G.2: Sample of a landscape oriented figure with top-right page numbers from a student’s thesis [59].