

PROCEDURES AND STANDARDS FOR MASTER OF ENGINEERING THESES

UNIVERSITY OF LOUISVILLE

J. B. SPEED SCHOOL OF ENGINEERING

Louisville, Kentucky

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I. PROCEDURES FOR MASTER OF ENGINEERING THESES

Students desiring to pursue the first professional degree of the J. B. Speed School of Engineering, the Master of Engineering, are required to formally apply for admission to the Division of Higher Studies in the Professional School. Acceptance of a student in the Division of Higher Studies requires the approval of the faculty and chair of his/her department. An applicant who is enrolling in J. B. Speed School of Engineering for the first time or after a lapse of one or more semesters may be assigned, upon formal acceptance into the Division of Higher Studies, an interim advisor by the department chair to assist with the student's initial registration. A student who does not register for two years or attends another university must re-apply for admission thru the University of Louisville Admissions Office. A timeline for students pursuing the Master of Engineering degree culminating in the thesis can be found in Appendix I.

A. Reading Committee

Upon acceptance into the Division of Higher Studies and after consultation with department faculty, the student should select and upon agreement be assigned a Master of Engineering project director. This faculty member also becomes the Director of the student's Master of Engineering thesis.

Each prospective candidate for the Master of Engineering degree is required to prepare a short description of the project to be undertaken for approval by the student's thesis director and department chair.

The examination committee will consist of at least three faculty members of the J. B. Speed School of Engineering as follows:

1. The student's Master of Engineering thesis director,
2. One additional faculty member from the department of specialization, and
3. One faculty member from outside the department of specialization who represents the Professional School-at-large.

Additional examination committee representatives from within or outside Speed School may be added at the request of the student or thesis director. A representative from outside the Professional School may serve as co-director with a faculty member representing the department of specialization. If the recommendations include representatives from outside Speed School, appropriate information about the individuals should be provided by the thesis director to the department chair.

The examination committee will then be formally appointed by the department chair who will notify the Master of Engineering degree candidate, the examination committee, and the Academic Affairs Office by distribution of the Appointment of Members of the Examination Committee form shown in Appendix II.

B. Final Examination

The student's Master of Engineering committee is responsible for the approval of the Master of Engineering thesis and for conducting the student's oral examination and thesis defense. The oral examination and thesis defense should be given before the last day of the final examination period of a semester or summer term. The thesis director and student are expected to arrange an agreed time mutually convenient to all individuals involved for the oral examination and thesis defense with the time and location reported to the Office of the Associate Dean and the appropriate department chair at least seven days prior to the expected examination date using the Oral Examination Request form shown in Appendix III.

It is the student's responsibility to see that each member of the examination committee receives a complete printed copy of the thesis at least seven days prior to the date of the oral examination and thesis defense. This copy shall conform to the Procedures and Standards for Master of Engineering Thesis.

The oral examination is public and will primarily concern the investigative work of the candidate as embodied in the thesis, but it may extend over the field of specialization at the examining committee's discretion. Approval must be received from a majority of the members of the student's examination committee in order to pass.

The result of the final examination must be reported to the Academic Affairs Office on the Oral Examination Results form shown in Appendix IV within 48 hours of the completion of the examination.

After passing the oral examination, the student must then incorporate into the thesis corrections and revisions required by the committee. A complete revised printed copy of the thesis must be submitted to the thesis committee for their final approval and signatures. The thesis director is responsible for insuring that the copy which he/she approves incorporates all corrections and revisions and meets the Procedures and Standards for Master of Engineering Theses.

A printed copy of the thesis must be submitted by the student to the appropriate department chair (or the designee) at least three days before the end of a semester or summer term so that format, form and physical standards of all theses written by students in his/her department can be checked for compliance with the Procedures and Standards for Master of Engineering Theses. The student will then provide an electronic copy of the department-approved thesis to the Speed School Academic Affairs Office using the following guidelines for submitting electronic theses:

1. The digital document must appear in Adobe PDF format. No compression or password protection should be used.
2. Neither Speed School nor the University Libraries will make changes to the document, therefore the proper form and presentation of the document is entirely the responsibility of the author.
3. The author assumes responsibility for preparing the document according to Speed School's Procedures and Standards for Master of Engineering Theses, reformatting the document into Adobe PDF, checking the reformatted document for appearance, and submitting the PDF document on a CD to the Speed School Academic Affairs Office.
4. An electronic thesis may be of multiple file types. This feature allows PDF text to be accompanied by audio and video components. Having this option will expand the intellectual opportunities embedded in thesis writing.

TABLE OF CONTENTS - A complete outline of the major sections and subsections of the thesis including the pages on which these may be found. A sample TABLE OF CONTENTS is included as Appendix VII.

NOMENCLATURE - Must be included if symbols are used at locations in the thesis where they are not defined, otherwise optional. A sample NOMENCLATURE is included as Appendix VIII.

LIST OF TABLES - A complete listing of all tables arranged the same as for the Table of Contents. It should include the table captions and page references.

LIST OF FIGURES - A complete listing of all figures arranged the same as for the Table of Contents. It should include the figure captions and page references.

2. Text

The thesis must be written in the third person. It should be noted, however, that third person does not mean passive voice. The student is encouraged to use active voice as much as possible to contribute to the readability of the work. The text of the thesis is the main body of the report, giving the reader essentially the information suggested by the following items:

- (a) Introduction
- (b) Instrumentation and Equipment
- (c) Procedure
- (d) Results and Discussion of Results
- (e) Conclusions
- (f) Recommendations

While the first section is usually entitled "Introduction," the student is not required to follow the suggested outline so far as titles for sections are concerned; nor is it expected that every thesis will develop each of the items listed. The character of the work may make modifications desirable. A thesis in the field of computer engineering and computer science, for example, will hardly be expected to have a section devoted to instrumentation and equipment; and it is quite possible that the procedure may logically need more than one section for adequate treatment. It is recommended, however, that the development of the text follow the outline indicated above. It is a logical sequence in the presentation of research, and experience has shown that it will enable the reader to follow the essential details with the greatest degree of understanding.

A good test for the clarity and completeness of the text is whether a person reasonably familiar with the subject could use the description of what was done as a guide to follow through the same work and duplicate the results given.

- a. Introduction. The Introduction (normally Section I) should be a concise statement of the problem with regard to:
 - (1) Definition of the problem.
 - (2) Brief history leading to the problem.
 - (3) Purpose of the research.
 - (4) Review of the literature, indicating briefly what has already been done along the line of the problem, the difficulties that may have been encountered by other researchers, criticisms of previous approaches, etc. (If this item is extensive, the writer may wish to treat it as a separate section following the Introduction)
 - (5) An outline of the remainder of the work.

The primary purpose of the Introduction is to give the reader an insight into the problem, to arouse his/her interest, and to bring him/her up-to-date so far as the background for the student's own research is concerned.

- b. Instrumentation and Equipment. Instrumentation and equipment should be described and illustrated with sufficient precision so that a skilled person could set up the apparatus for a duplication of the research if necessary or desirable.
- c. Procedure. The procedure followed in the research should be described with sufficient clarity and detail so that the reader can duplicate the reported operations if he/she wishes.

- d. Results and Discussion of Results. These sections could be an abstracted or generalized description and interpretation of data contained in the thesis. Tables, charts, and curves of a summary nature should be included in this section. The greater bulk of the raw research data, however, should be reserved for the Appendices, and the reader referred to those sections if he/she wishes to verify statements. This discussion should point out highlights and items of significance in the data, and afford the author an opportunity to focus the attention of the reader toward whatever phases of the results he/she deems most important. The "results" are the hard facts presented in the actual data. The "discussion" is the writer's interpretation of those facts.
- e. Conclusions. The conclusions summarize the results of the research reported in the thesis and should not add new information. They should be based on factual findings. Each separate conclusion should be a one-sentence statement, and the conclusions as a whole should be listed in a logically sequential order. Since conclusions are often lifted out of the context of the thesis and quoted without the accompaniment of explanatory material that may precede and follow them, care should be taken in composing each conclusion to be sure that it does not imply a broader scope than is intended, and that it includes the necessary qualifications.
- f. Recommendations. In many instances, the work done in procuring information and test data for a thesis uncovers many interesting and valuable allied problems. The recommendations are, therefore, an expression of the author's advice regarding future improvements, or suggestions for future allied research. They are based on the experience gained while carrying out the thesis work; although they are only opinions (which are permissible in this section of the thesis) or tentative hypotheses, they may prove to be of considerable value to future researchers working in the same or an allied area.

3. Matter Following Text

APPENDICES - The appendix or appendices should contain the bulk of the research data or findings as embodied in the tables, diagrams and sketches, curves and photographs. It should contain such items as sample computations and derivations, sample schedules, computer programs, and questionnaires. The purpose of the appendix is to make available to the reader those details or data that will verify the summary statements reported under "results" in the text, but that would obscure the development of the presentation if included in the main body of the thesis.

LIST OF REFERENCES - Includes citations to all sources referenced in thesis.

BIBLIOGRAPHY - Includes both sources consulted and sources cited (Optional).

VITA - Brief biographical sketch of the author.

B. Form of References

Each department may specify one or two journals of its discipline as examples of the form of citing references.

1. General

Used to cite the authority for statements made in the text. If the department does not specify a preferred reference citation, a parenthetical citing is to be used. The author's name and the year of publication will be listed within parentheses where they are first introduced in the text. If the author's name is cited within the context of the sentence, the year should follow the author's name within parentheses. If a specific page is to be cited from a reference, a comma follows the year and then the page number is listed.

2. Basic Style

All references are listed at the end of the text in alphabetical order and then in chronological order if more than one work by the same author is cited. The author's name is placed flush with the margin and succeeding lines of the entry are indented five spaces. When two or more works by the same author appear in succession, a continuous line eight spaces in length, followed by a period, may be substituted for the author's name after its first appearance. Spacing is single spaced with one blank space between entries. The reference should be given in complete form; that is, it not only should include the author's name, the title, and the volume and/or page number, but it should give the facts of publication as well.

Examples of the basic form from Turabian, 1996, follow. Words that are italicized in examples may be underlined if italics are not available on the computer system or typewriter being used (Turabian, 1996, 68):

Books:

Franklin, John Hope. 1985. *George Washington Williams: A Biography*. Chicago: University of Chicago Press.

Internet Documents:

Author (in normal order). "Title of source to be cited." *Source of citation*. date of publication. URL address. date accessed.

Michael Harris, "Citing on-line sources," *Internet Source*, 8 June 2006, available from <http://www.internetsource.edu.html>; accessed 8 June 2006.

Journals:

Tanaka, E., Tanne, K., and Sakuda, M. 1994. A three-dimensional finite element model of the mandible including the TMJ and its application to stress analysis in the TMJ during clenching. *Journal Medical Engineering and Physics* 64:725-736.

Legal Citations: Plaintiff v. Defendant, Volume name (capitalized and abbreviated) and page number. Next, in parentheses, come the name of the court that decided the case and the year it was decided.

Thompson v. Smith, 170 F. Supp. 331 (D. Conn. 1987)

Newspaper:

McDonough, R. 1988. "Pass the scooper, save the soles: ordinance may mean dog owners' business is picking up." *Courier Journal* (Louisville, Kentucky). June 14.

Patent:

Pinnow, D. A. 1974. U.S. Patent 3,810,802.

Personal Correspondence:

Smith, R. 1995. Private communication.

Proceedings:

Hart, R. T. and Thongpreda, N. 1988. A finite element based study of the biomechanics of the mandible. *Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society (New Orleans, Louisiana)*, 4:1886-1887.

Public Documents:

U.S. Congress. House. 1985. *Food Security Act of 1985*. 99th Cong., 1st sess., H. R. 2100. *Congressional Record*, 131, no. 132, daily ed. (8 October): H8353-H8486.

Software:

Microsoft Excel 2003. Microsoft Corporation. Redmond, Washington.

Technical Reports:

Robsen, Barbara. 1984. *Tanzania: Country status report*. Washington, D. C.: Center for Applied Logistics, Language/Area Reference Center. ERIC, ED 248700.

Thesis/Dissertation:

Esterle, Michael E. 1996. Three Dimensional Finite Element Analysis of a Mandibular Implant. Master of Engineering thesis, University of Louisville.

Unpublished Sources:

Harris, Michael. 2006. Procedures and Standards for Master of Engineering Theses. J. B. Speed School of Engineering, University of Louisville.

C. Form of Bibliography (Optional)

The arrangement of the Bibliography is the same as References including all relevant sources consulted in the preparation of the thesis.

III. TYPING THE THESIS

A. Physical Standards

Type

Times New Roman, Arial, Tahoma, or Courier New, in size 12 point, are acceptable fonts. Eccentric font styles, such as italic or cursive, are not permitted. The entire thesis must be printed in black, letter-quality print, and of the same type throughout.

B. Form

1. Spacing

All text should be double spaced throughout with these exceptions: single space within an inset quotation and within references (double space between items).

Margin widths should be as follows: left margin, one and a half inches; other margins, one inch. The right-hand margin should be kept as uniform as possible. All figures, drawings and tables must meet margin requirements (including Appendices). They may be reduced in size if necessary provided that the reduced pages can be read without the assistance of a magnifying glass.

Paragraphs should begin with an eight-space indentation with long quotations indented four spaces, and an additional four spaces for paragraphs within quotes.

2. Headings

Each section must begin on a new page. The titles of sections preceding and following the main text (ABSTRACT, APPENDIX I, etc.) are typed in full capitals, placed on the tenth line below the top edge of the paper and centered between margins. If a title requires more than one line, additional lines are double-spaced. The first line of typing begins three single spaces below the section title. The titles of major sections within the main text (INTRODUCTION, CONCLUSIONS, etc.) are typed in full capitals after a capital Roman numeral followed by a period. The first major section is identified by I, the second by II, etc.

The arrangement of subsections within the text and their spacing is explained by the headings in the following example:

a. First-order Heading

If there is but one rank of heading within a section, subdivisions should be indicated by an underlined centered heading in initial capitals following a capital letter. There should be two blank lines between it and the last line of text above and one blank line between it and the text following.

b. Second-order Heading

If there are two ranks of headings, subdivisions within the main rank are indicated by an underlined heading in initial capitals following an Arabic number. There should be one blank line above and below. The heading begins at the left margin.

c. Third-order Heading

If there are three ranks of headings, the third order should be indicated by a heading indented eight spaces (the number of spaces indented for a regular paragraph), underlined, and in initial capitals following a lower case letter. A period follows this title and, after two spaces, the paragraph begins on the same line.

3. Equations and Formulas

Equations and formulas should be separated by three blank lines (two double spaces) from the preceding and following lines of text, and centered between margins. Equations and formulas should be numbered with Arabic numerals running consecutively throughout the thesis. The number is placed in line with and at the right of the first line of the equation or formula, and it should be enclosed in parentheses but have no other punctuation. The right-hand parenthesis mark should be in line with the right-hand margin. The use of the equation editor in MS Word, or similar software, is recommended.

- a. Space on either side of +, - (when used as binary operators), and =; but not •, or /.
- b. No space after +, -, ± when used as unary operators; e.g., +5, -4, ±10.
- c. Space after function name (e.g., *cos*, *ln*, etc.) except when followed by parentheses.
Example: $\ln x$, $\sin 3x$, but $\ln(x+2)$, $\sin(3x^5)$
- d. Hierarchy of parentheses {...[...(....)]...}
- e. Use an ellipsis (...) as a single character; e.g., x_1, x_2, \dots, x_n and $x_1 + x_2 + \dots + x_n$.
- f. In displayed fractions, use $\frac{A}{B}$, not A/B, when A, B are expressions, except computer code.
- g. When you break an equation; $A = \dots$
 Break at + or - (if possible)
 Continue to right of = sign.

4. Pagination

Every page in a thesis (except for the blank page following the title page) should be assigned a number. The following plan must be used:

- a. For the preliminaries, use lower case Roman numerals (i, ii, iii, iv, etc.) at the bottom center of the page. The title page counts as i but the number does not appear; the numbering should begin with ii. The blank page following the title page is not assigned a number, but all remaining preliminaries (Approval Page, Abstract, Acknowledgments, Table of Contents, Lists of Tables and Figures) are numbered with lower case Roman numerals.
- b. For the remainder of the thesis, including Text, Appendices, References and Vita, use Arabic numerals at the bottom center of the page utilizing the page numbering feature of MS Word. Numbering should begin with 1 on the first page of the first section and run consecutively to the end of the thesis. Do not use letter suffixes such as 10a, 10b, etc.

5. Tables and Figures

Above each table, whether appearing in the text or as an appendix, the word TABLE, followed immediately by the number of the table in capital Roman numerals, shall be centered. A brief and descriptive caption, in full capitals, shall be centered on the second line below the Table number. For example:

TABLE III
 AVERAGE COMPOSITION OF INCINERATOR REFUSE

Below each graph, drawing or photograph, the word FIGURE followed by the number of the figure in Arabic numerals shall appear. The caption shall follow the Arabic numeral in initial caps and lower case letters, all centered. For example:

FIGURE 4 - Residue Specific Gravity

Appendices of any other kind follow the same basic form as that given for Tables and Figures, including consecutive numbering of tables and figures in Appendices.

6. Units

All units must be either Standard International or English units; i.e., meters or feet. Whichever is chosen, consistent use is mandatory. Common abbreviations may be used (m or ft), but again consistency must be maintained. Refer to NBS Special Publication 330 available in the Ekstrom Library.

7. Numerals

In the textual material itself, the number 10 or over should be expressed in figures; and numbers under 10 should be spelled out with the following exceptions: any number, regardless of size or nature, that occurs at the beginning of a sentence must be spelled out; numbers appearing in a statistical series (e.g., 2, 4, 29 and 48) should be expressed in figures; as should date, page, street and telephone numbers, decimals and percentages, and sums of money (except round sums used alone).

8. Common Thesis Problems

- Be consistent in notation, style, and form.
- Use only letter-quality printers.
- Watch margins.
- Give titles to all figures and tables.
- Use Appendices for lengthy proofs or excessive data or other such material. Appendices must also meet requirements of M.Eng. Standards.
- Don't forget the Vita.
- Do not use other theses as examples — use only these Standards.
- When in doubt, ask in advance.
- Don't be presumptuous; run copies after approval.
- Grammatical errors: Spelling; agreement of noun and verb; misused punctuation.

C. Checklist

The Master of Engineering Checklist (see Appendix X) should be used to ensure that all the required forms are submitted to the Academic Affairs Office once your thesis is complete. In addition, information is provided regarding your copyright option and about binding your thesis.

IV. REFERENCES

Goldman, D. T., and Bell, R. J., eds. 1981. *The International System of Units (SI)*. *NBS Special Publication 330*, National Bureau of Standards, Washington, D.C.

Guidelines for the Preparation and Processing of Theses. 2003. The Graduate School, University of Louisville, Louisville, Ky.
(available at the Graduate School Office and on the Graduate School webpage).

Turabian, K. L. 1996. *A Manual for Writers of Term Papers, Theses, and Dissertations*, 6th ed. Revised by John Grossman and Alice Bennett, Chicago and London: The University of Chicago Press.

APPENDIX I

TYPICAL TIMELINE FOR MASTER OF ENGINEERING THESIS

PART A (First Two Terms)

1. Submit application for admission to Graduate Professional School on or before the third week of the term in which you are to complete the B.S. requirements.(Notification of acceptance will be received from the Assistant Dean for Academic Affairs).
2. Student should meet with Department Chair and/or Department Faculty prior to the end of the Semester to obtain information on Thesis Directors and possible Thesis Topics. In many departments this information may be supplied in the Professional Seminar.
3. Choose in consultation with the Faculty Advisor and Department Chair a Thesis Director and Thesis Topic by the third week of the first term in the Division of Higher Studies.
4. Submit the form (Appendix VI) requesting approval of a tentative thesis title and Thesis Committee by the fifth week of the term.
5. Meet with the Thesis Committee within three weeks after its appointment by the Department Chair.
6. Submit a Progress Report to the Thesis Committee and Department Chair at the end of this first term.
7. First Progress Report should include: 1) Literature Search, 2) Statement of Problem, 3) Apparatus Required, 4) Work Completed to Date, 5) Budget, if appropriate.
8. Meet with the Thesis Committee between the third and ninth week of the second term.
9. Submit a Progress Report to the Thesis Committee and Department Chair at the end of the second term.
10. Second Progress Report should include: 1) Description of Experiment, 2) Apparatus Constructed, 3) Additional Work Completed.

Note: Submit equivalent information for software projects.

PART B-1 (Final Semester)

FALL OR SPRING

1. Meet with your Thesis Director to outline the thesis contents before the second week.
2. Meet with your Thesis Director for a thesis writing progress discussion before the sixth week.
3. Submit preliminary written thesis material to Director by the end of the seventh week.
4. Submit complete thesis copy to Director by the end of the eleventh week.
5. Report date, time and location of oral exam on the proper form (Appendix VII) to the Academic Affairs Office by the end of the twelfth week.

6. Deliver final draft copies of the thesis to the members of the Examination Committee by the twelfth week.
7. Have oral exam by the end of the thirteenth week.
8. Thesis Director must report the results of the oral exam to the Academic Services Office on the proper form (Appendix VIII) within 48 hours after completion of the exam.
9. Return corrected copy of thesis to Thesis Director within two days after the oral exam.
10. Deliver one complete final copy to the Department Chair or Departmental Editor three days before the end of semester.
11. The student must deliver one electronic copy of the complete approved thesis to the Speed School Academic Affairs Office on or before the last day of the semester. This electronic copy must follow the guidelines for submitting an electronic version of the thesis. A note of approval signed by the Department Chair and a signed copy of the Nonexclusive License for Electronic Theses and Dissertations (see Appendix IX) must accompany the copy.

PART B-2 (FINAL SEMESTER)

SUMMER

1. Meet with your Thesis Director to outline the thesis contents before the second week.
2. Meet with your Thesis Director for a thesis writing progress discussion before the third week.
3. Submit preliminary written thesis material to Director by the end of the fifth week.
4. Report date, time and location of oral exam on the proper form (Appendix VII) to the Academic Services Office by the end of the eighth week.
5. Deliver final draft copies of the thesis to the members of the Examination Committee by the eighth week.
6. Have oral exam by end of the ninth week.
7. Thesis Director must report the results of the oral exam to the Academic Services Office on the proper form (Appendix VIII) within 48 hours after completion of the exam.
8. Return corrected copy of thesis to Thesis Director within two days after the oral exam.
9. Deliver one **COMPLETE FINAL** copy to the Department Chair or Departmental Editor three days before the end of the semester.
10. The student must deliver an electronic copy of the complete approved thesis to the Speed School Academic Affairs Office on or before the last day of the semester.

APPENDIX II

APPOINTMENT OF MEMBERS OF THE EXAMINATION COMMITTEE

UNIVERSITY OF LOUISVILLE

J. B. SPEED SCHOOL OF ENGINEERING

_____ (Date)

MEMO TO: Academic Affairs Office
J. B. Speed School of Engineering
FROM: (Insert name of Thesis Director, and Home Department)
SUBJECT: Appointment of Members of the Master of Engineering Examination Committee for
(Insert name of M.Eng. candidate)
THROUGH: (Insert name of Department Chair)

I. CONSTITUENCY OF EXAMINATION COMMITTEE

It is recommended that the following individuals be officially designated as members of the Master of Engineering Examination Committee of subject M.Eng. candidate. Each of these persons has been contacted, and has agreed to serve on the Examination Committee (see page 1 for more detail on constituency of the committee):

(Name, Department)

- 1. _____ Thesis Director
- 2. _____ Member
- 3. _____ Member
- 4. _____ Member

In addition to the foregoing membership of the Examination Committee, it is requested that the following committee representatives from outside Speed School, each of whom has agreed to serve, be appointed as Members of the Examination Committee:

- 1. _____ External Member
(Name)

(Mailing Address of External Member)

- 2. _____ External Member
(Name)

(Mailing Address of External Member)

II. M.ENG. PROJECT DESCRIPTION

A brief description of the proposed M.Eng. Project is as follows:

**APPENDIX II
(continued)**

A tentative title (10 words or less) of the proposed M.Eng. Thesis is:

(Signature of Thesis Director)

III. APPROVAL BY DEPARTMENT CHAIR

The Thesis Director has conferred with me relative to the investigation, thesis topic and committee membership of the indicated student, and I concur with the recommendations.

(Signature of Department Chair)

General Instructions:

The student in collaboration with the Thesis Director should prepare this form: original to the Department Chair, copy retained by the student, and one copy for the Thesis Director's file.

Full-time students must submit the project description and constituency of the Master of Engineering examination committee according to the specific dates in Appendix I.

Part-time students must submit the project description and constituency of a Master of Engineering examination committee not later than one calendar year prior to the student's expected date of graduation.

Approval form to be distributed by Department Chair to M.Eng. candidate, thesis director, committee members, and Academic Affairs Office.

APPENDIX III

ORAL EXAMINATION REQUEST

UNIVERSITY OF LOUISVILLE

J. B. SPEED SCHOOL OF ENGINEERING

(Date)

MEMO TO: Academic Affairs Office

FROM: (Insert name of M.Eng. Thesis Director)

SUBJECT: M.Eng. Oral Examination and Thesis Defense for (Name of Student)

1. The oral examination and thesis defense of subject degree candidate will be held on
_____ (Day of Week), _____ (Date), at _____ (Time) in Room
No. _____ of _____ (Building).

2. The title of the M.Eng. Thesis is:

(Signature of Thesis Director)

THE STUDENT IS RESPONSIBLE FOR DISTRIBUTION OF THESE COPIES

- Copies to:
- 1) Department Chair _____
 - 2) Thesis Director _____
 - 3) Committee Member _____
 - 4) Committee Member _____
 - 5) Committee Member _____
 - 6) Committee Member _____

APPENDIX IV

ORAL EXAMINATION RESULTS

UNIVERSITY OF LOUISVILLE

J. B. SPEED SCHOOL OF ENGINEERING

_____ (Date)

MEMORANDUM TO: Academic Affairs Office
FROM: (Insert name of Thesis Director)
SUBJECT: M.Eng. Oral Examination and Thesis Defense For (Name of Student)

1. The oral examination and thesis defense of the above named degree candidate was held on _____ (Day of Week), _____ (Date) in Room No. _____ in _____ (Building).
2. The examination and defense began at _____ (Time) and was concluded at _____ (Time).
3. The candidate **PASSED FAILED** (delete whichever not applicable) the oral examination and thesis defense.
4. Qualifications or clarifying statements considered to be important by the Thesis Director (Optional):

(Signature of Thesis Director)

Copy to: Department Chair

APPENDIX V

SAMPLE TITLE PAGE

The steps for creating the title page are listed below. An example of the title page is on the next page.

- Step 1: Set top margin to 1½ inches, then centered on the page, type the title of the thesis, all in capital letters.
- Step 2: Skip six blank lines.
- Step 3: On the next line and centered on the page, type “By”
- Step 4: Skip one blank line.
- Step 5: On the next line and centered on the page type your name.
- Step 6: On the next line and centered on the page type the name of your undergraduate degree, where you earned your undergraduate degree, and the date you earned your undergraduate degree.
- Step 7: Skip five lines.
- Step 8: On the next line and centered on the page type “A Thesis”
- Step 9: On the next line and in the center of the page type “Submitted to the Faculty of the”
- Step 10: On the next line type “University of Louisville”
- Step 11: On the next line and centered on the page type “J. B. Speed School of Engineering”
- Step 12: On the next line type “in Partial Fulfillment of the Requirements”
- Step 13: On the next line and centered on the page type “for the Professional Degree”
- Step 14: Skip five lines
- Step 15: On the next line, centered on the page and in all capital letters type “MASTER OF ENGINEERING “
- Step 16: Skip five lines
- Step 17: On the next line and centered on the page type either “Program in Engineering Management” or type the name of the engineering department your degree is from, for example “Department of Mechanical Engineering”
- Step 18: Skip three lines
- Step 19: On the next line and centered on the page type the Month and year your Master of Engineering degree was awarded

A 1400 MHZ RADIOMETER FOR USE IN
MAKING RADIO ASTRONOMICAL OBSERVATIONS

By

Oskar Hermann Altenhoff
B.S., University of Louisville, 2005

A Thesis
Submitted to the Faculty of the
University of Louisville
J. B. Speed School of Engineering
as Partial Fulfillment of the Requirements
for the Professional Degree

MASTER OF ENGINEERING

Either
Or

Program in Engineering Management
Department of Mechanical Engineering

April 2006

APPENDIX VI

SUGGESTED APPROVAL PAGE

The steps for creating the approval page are listed below. An example of the approval page is on the next page.

- Step 1: Set top margin to 1½ inches, then centered on the page, type the title of the thesis, all in capital letters.
- Step 2: Skip three blank lines.
- Step 3: On the next line and centered on the page, type “Submitted by:” followed by a line for your signature that is 34 spaces in length.
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- Step 5: Skip three lines.
- Step 6: On the next line and centered on the page type “A Thesis Approved On’
- Step 7: Skip three lines.
- Step 8: On the next line and centered on the page type a signature line that is 35 spaces in length.
- Step 9: On the next line and in the center of the page type “(Date)”
- Step 10: Skip four lines.
- Step 11: On the next line type “by the Following Reading and Examination Committee:”
- Step 12: On the next line and centered on the page type a signature line that is 35 spaces in length.
- Step 13: On the next line type the name of your thesis director, followed by a comma, and then type “Thesis Director”
- Step 12: Skip three lines
- Step 13: On the next line and centered on the page, type a signature line that is 35 spaces in length for a committee member’s signature.
- Step 14: On the next line and centered on the page, type a committee member’s name.
- Step 15: Skip three lines
- Step 16: On the next line and centered on the page, type a signature line that is 35 spaces in length for a committee member’s signature.
- Step 17: On the next line and centered on the page, type a committee member’s name.
- Step 18: Skip three lines
- Step 19: On the next line and centered on the page, type a committee member’s name.
- Step 20: Repeat Steps 18 – 20 until all committee members have been listed.

A 1400 MHZ RADIOMETER FOR USE IN
MAKING RADIO ASTRONOMICAL OBSERVATIONS

Submitted by: _____
Oskar Hermann Altenhoff

A Thesis Approved on

(Date)

by the Following Reading and Examination Committee:

Alfred A. Nobel, Thesis Director

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Ralph A. Nader

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APPENDIX VII

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APPENDIX VIII

NOMENCLATURE

A	=	cross-sectional area
E	=	modulus of elasticity
G	=	modulus of rigidity
I	=	cross-sectional moment of inertia
J	=	torsional constant
K'	=	shearing constant
KB	=	bending dynamic stiffness matrix
KT	=	torsional dynamic stiffness matrix
L	=	length of beam element
M	=	mass per unit of length
M _A , M _B	=	bending moments at A and B
P _A , P _B	=	axial forces at A and B
T	=	time
T _A , T _B	=	torsional moments at A and B
V _A , V _B	=	shear forces at A and B
X	=	L
Y	=	transverse beam deflection
γ	=	$(\frac{m \omega^2}{AG})^{1/2}$
ρ	=	mass density
ω	=	frequency

APPENDIX IX

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