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INTRODUCTION

Kentucky State University requires a thesis for a Master of Science in the Aquaculture/Aquatic Science. The thesis demonstrates creativity, dedication, and ability to work independently. It should make a significant scholarly contribution. A thesis must be the result of the student's own research, analysis, and writing, and generally must be the work of a single author. Multiple authorship is permitted if the student is the primary author.

Theses must meet the requirements of the Aquaculture Program. The purpose of this Guide is to explain and demonstrate those requirements, to direct the student in following the required steps, and to help the student comply with the necessary deadlines.

DEADLINES

The Aquaculture Program follows the calendar dates listed in the Kentucky State University Schedule of Courses printed each semester, the Kentucky State University home web page, and also available separately at the Aquaculture Research Center. The calendar for each semester lists deadlines for the submission of theses and for meeting other requirements. Students who expect to graduate must request a graduation check-out form in the Aquaculture Program no later than the second week of the semester prior to the semester of graduation (Plans of Study must be on file at the Aquaculture Research Center). Also, students must indicate expected graduation during registration for the final semester or notify the Aquaculture Program no later than the fifth class day. These deadlines are important and exceptions to them seldom will be permitted. Failure to meet them may result in postponement of graduation.

USE OF COPYRIGHTED MATERIAL

Students must obtain permission from the author or publisher of copyrighted materials used in a thesis beyond the limits of the "fair use" doctrine. The student includes appropriate acknowledgment in the manuscript, and is responsible for any payment. The student is responsible for any copyright violations. An explanation of copyright law and fair use, along with a guide to obtaining written permission from copyright owners, may be found in The Chicago Manual of Style. Chicago: The University of Chicago Press (http://www.lib.ohio_state.edu/guides/chicagogd.html.)

The general fair use practice is that quotation of a brief prose passage or several lines of verse does not require permission. However, fair use nowhere is spelled out exactly. In any case, the student must quote accurately and credit the source.
STYLE MANUALS

In addition to this Guide, the student follows the style appropriate to the field of study. (See Note on page 11.) Information on the proper style manual, journal, or computer software should be obtained from the major professor.

The student must indicate the manual or journal and the computer software used. This is done on a separate page which follows the Acknowledgment page.

PROBLEMS WITH PHOTOCOPIERS

Photocopiers may slightly enlarge material, usually by about three percent, causing even the most carefully prepared manuscript to violate margin requirements. The student may include extra space on left and right margins and an extra line or two at top and bottom to allow for this enlargement. Alternately, the printing firm providing the final copies can be asked to reproduce the manuscript at slightly reduced size.

RESPONSIBILITIES

The Student

The student works under the guidance of a major professor with a committee of faculty members. However, the obligations of research, accuracy, writing, and quality rest with the student.

The student's minimum responsibilities include:
C Thorough and original research and analysis.
C Organizing and presenting well-written material accurately and usefully in clear and correct English.
C Following correct form in quotations, footnotes or endnotes, bibliographical citations, and illustrative materials.
C Presenting a manuscript meeting the requirements of the Aquaculture Program.
C Making corrections suggested by the examining committee and required by the Aquaculture Program, where appropriate.
C Checking final copy for errors before the final examination.
C Seeing that all steps toward final approval are taken on time, including the filing of the necessary forms as outlined in this guide.
C Insuring that the work is entirely the student's own except where reference is made to the work of others.

The student should not use a previously approved thesis as a model because requirements may have been changed since its approval, leading the student to incorrect work that will have to be redone.
The Major Professor and the Committee

The major professor will guide the student on research, analysis, writing, and other scholarly aspects of the work. Members of the student’s committee contribute, but the primary responsibility is that of the major professor. Submission of a thesis is defined as the time at which the first complete draft of such is submitted to the major professor for review. After the major professor approves the draft for committee revision, the student will then submit the manuscript for critical review. Each may suggest improvements and refuse approval pending additional work. When committee members and the major professor sign the Approval Page, they certify that the thesis is clear and accurate, that it represents an original and worthwhile contribution, that the suggestions made by them are incorporated into the final work, and that the work conforms to the standards of Kentucky State University Aquaculture Program.

No faculty member will sign a thesis until it is of foremost quality and meets all requirements.

The major professor and committee members must sign their names personally. There can be no temporary substitute members and no other person may sign a committee member’s name on an Approval Page, even with the authorization of the committee member involved and the major professor.

The Aquaculture Program

The evaluator in the Aquaculture Program assesses overall quality of each thesis. The evaluator sees that all necessary steps are taken and deadlines met.

The signature of the Aquaculture Coordinator, or a representative appointed by him/her, is required on approval pages of theses to signal final approval by Kentucky State University. The signature is obtained by the thesis evaluator.

MANUSCRIPT REQUIREMENTS

The student must present a well-written and error-free manuscript. The unbound final required copies provided to the Aquaculture Program must be of professional quality with text and illustrations clear, sharp, and suitable for microfilming.

Preparation of a thesis may be expensive. Each student should have a financial understanding in advance with typists and those involved in photographic work or drawings.

Paper

The required final copies must be on white bond paper of at least 16 pounds weight and at least 50 percent cotton rag content. The paper must be 8 1/2 by 11 inches. Paper on
which it is easy to erase, such as Corrasable, cannot be used since the characters are not permanent and may smudge. Tear-away or tractor-feed computer paper also is unacceptable for final copies.

Copy

The copy must be printed on one side only. It must not have overstrikes, crossed-out material, defective type, lines from paste-ups, shading in the background, smears, or mistake covers leaving a discernible film or smudge. Use of photo-mounting corners, staples, or transparent tape is not permitted in any final copy. Rubber cement or a dry adhesive such as provided by a glue stick may be used. Impact or laser printers associated with word-processing equipment must be used.

Regular style type of 12 characters per inch (12-point type size) should be used. Type such as italics should be limited to commonly accepted usages, such as genus species. It cannot be employed for chapter titles, subheads, and similar items. Boldfaced material is unacceptable in the preliminary pages. The type should provide clear and even characters without non-standard lumps or breaks.

Margins

Illustrations of margin requirements are on page 14.

C Top, bottom, and right: one inch. Left: one and a half inches. The extra space on the left is necessary for binding.
C On the first page of a major division such as a chapter, the Bibliography, etc., the top margin is two inches.
C All tables and figures must conform to the margin requirements even if photographic reduction is necessary.
C Use of justified lines to make the right margin print evenly requires the prior approval of a sample page by the thesis evaluator.
C An exception to the bottom margin requirement may be made when a subhead is near the bottom of the page. The subhead must have at least two full lines of type below it. Otherwise, the page should be left short and the subhead placed on the next page.
C An exception to the bottom margin rule also may be made when a paragraph begins near the bottom of a page. The paragraph must include at least two lines of type on that page and two lines of type on the following page. Otherwise, the paragraph should begin on the following page, which will leave the previous page short of copy.
C One other exception involves hyphenation. The last word on any page cannot be hyphenated. The line should be left short of the right margin and the whole word typed on the following page.
Spacing

Double spacing, or a near approximation of double spacing, should be used in the general text and the Vita, the Abstract, and Acknowledgments (pages 19-21). Spacing on other prefatory pages such as the Approval Page, the Title Page, and the Copyright Page should follow the examples on pages 15-18. For the remainder of the thesis, the student will use the spacing required by the appropriate style manual, journal, or computer software. (See Note on page 11.)

Page Numbering

Preliminary pages, such as the Table of Contents, the Abstract, and the Vita, are numbered in small Roman numerals centered an inch from the bottom on all pages involved.

1. The pages of the body of the thesis, including text, Bibliography, etc., are numbered in Arabic numerals.
2. On pages in the body of the the with a major heading, such as a chapter title, the first page of the Bibliography, etc., the number should be centered an inch from the bottom of the page.
3. On all other pages in the body of the thesis, the number is centered an inch from the top.
4. All page numbers stand alone, without punctuation.
5. The Approval Page and the Title Page are not numbered. The Approval Page is considered to be page Roman numeral i, although the number does not appear on the page. The Title Page is understood to be page Roman numeral ii, although again the number does not appear on the page.
6. All theses include a Copyright Page, which will be number iii with the number included on the page. This will be the first page in a thesis on which the page number appears.

STEPS TO AN APPROVED THESIS

The student researches and prepares the thesis under the guidance of the major professor and with the advice of members of the committee. The first draft is submitted to the major professor, who may deem it adequate or may order corrections, further research, or other work. When the major professor is satisfied with the thesis, a copy is circulated among the committee members, who may request additional corrections or work. The student then prepares a draft incorporating all changes and corrections.

The student is urged to have the evaluator to conduct a format check. This check is optional. If the student elects not to have this optional format check, the format check will be required only for final approval. If errors then are detected, the thesis will be returned to the student. This may delay graduation, since the student will have to make needed corrections.
Upon the student's successful completion of the oral examination and a final draft of the thesis which meets their approval, the major professor and the committee members formally approve by signing the thesis Approval Page. There must be three original copies of the Approval Page, meaning each member of the committee must sign all three.

The major professor and the committee members normally will sign approval pages at the final thesis defense. However, they may delay signing if they determine that additional work still is required. In that case, it will be necessary for the student to obtain the signatures when all work is completed to the satisfaction of the major professor and the committee. The student must remember that there can be no substitute committee members and no one may sign for an absent committee member or copy a committee member's signature.

When all work is completed and the signatures obtained, the student takes the approved final copies to the evaluator for the final format check and approval.

At least three copies of the corrected thesis must be bound; two to be retained by the library and one by the student's major professor. The student may desire additional copies. Each copy to be bound must be turned in to the Aquaculture Program and must include an Approval Page. However, original signatures are necessary only on the three copies required for the library and the major professor.

The student has the responsibility and expense of having all copies bound.

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**ORGANIZING THE MANUSCRIPT - PUBLICATION FORMAT**

Students are required to write their thesis in a publication format with the intent to publish in a book or journal. These guidelines should be considered as establishing minimum requirements and major professor have the option for additional preferences or requirements. Students should clarify these preferences with their advisory committee prior to beginning the writing of their thesis.

A majority of the actual research and the writing of each published paper used in the thesis must represent the efforts of the primary student author and not collaborators. The research should represent work performed while in the graduate program at Kentucky State University. The student must be the primary author of each manuscript and normally would share authorship only with the major professor. Papers that include other authors can be used provided the efforts of the other authors represent less than half of the total effort. The primary (student) author's effort should represent, in the judgment of the faculty supervisor and the student's advisory committee, a majority of the total effort expended in performing the research and preparing the manuscript (51 percent or more).
The Approval Page (See Examples on pages 15 and 16.)

The Approval Page is not numbered but is understood to be page Roman numeral i when totaling the number of typed pages for the Abstract. Except where reference is made to the work of others, the work described in this [thesis] is my own or was done in collaboration with my advisory committee.

The statement must be followed by the student's signature and typed name. All committee members' names must be included. The names must be typed as the committee members sign their names. Academic title and department follow. There should be no commas at the end of the title lines, and administrative titles, such as "Head" or "Dean," should not be used for committee members. Information below the line cannot be longer than the line. The name of the committee chair (Major Professor) goes in the upper right position, followed by the word "chair," "chairman," or "chairperson" as desired.

For any committee member not employed at Kentucky State University, the institution employing the person and the name of the city and state, if appropriate, also should be given, along with the individual's academic rank or position. All signatures must be in black or dark blue ink.

The Title Page (See Example on page 17.)

The Title Page is not numbered. However, it is understood to be page Roman numeral ii when counting the total number of pages for the Abstract. If two or more lines are required for the title, they must be in inverted pyramid style and double-spaced. The date on the Title Page must be the date of graduation. A title should be a meaningful description of the content. Avoid oblique references, formulas, symbols, superscript, subscript, and Greek letters.

The Copyright Page in a Thesis (See Example on page 18.)

The Copyright Page is Roman numeral iii in theses and is the first page on which a number appears. The signature must be original and the date must be the date of graduation.

The Vita (See Example on page 19.)

The Vita is optional. The Vita, if used, will be Roman numeral iv in a thesis. The Vita may contain the full name of the student, the parents' names, the date and place of the student's birth, and a brief summary of academic training and experience. The student's non-academic training may be included if relevant to the field of specialization. The Vita also may contain information regarding marriage and children. It must be written as one long paragraph, in the third person, and on one page.
Abstract (See Example on page 20.)

The Abstract will begin on Roman numeral v in a thesis. The Abstract is a concise summary and is limited to two pages. None of it should be copied from the text. It should report only the essential characteristics of the study, describing the problem, procedure or method, results, and conclusions. References should not be included in the Abstract.

Degrees earned should be listed in reverse chronological order, single-spaced, with the degrees previously earned enclosed in parentheses. The date for the degree being conferred is the date of graduation, which is listed in the calendar for the semester of graduation. The total number of typed pages includes the prefatory pages such as the Approval Page, the Title Page, the Copyright Page in a thesis, the Vita, the Abstract, the Acknowledgments Page, if used, as well as the text, Bibliography or other reference list, and appendices.

Acknowledgments (See Example on page 21.)

An Acknowledgments Page, if used, follows the Abstract. Only one page is permitted and it continues the Roman numeral numbering sequence. The page must be included in the draft copy if it is to be accepted in the final copies. The Acknowledgments Page is optional. Appropriate comments might include a statement acknowledging the contributions of others, including the advisory committee and collaborators. It is particularly important to acknowledge co-authors of manuscripts submitted, or to be submitted, for publication.

Style Manual Page (See Example on page 22.)

The Style Manual page follows the Acknowledgment Page. The student must indicate the manual or journal and the computer software used. This is done on a separate page which follows the Acknowledgment Page.

NOTE

The format of the Table of Contents; lists of tables or figures; the main body of the thesis, including all illustrative material such as figures and tables; documentation of sources; and appendices must adhere to the guidelines in the style manual or journal preferred by the student's department.

Table of Contents

The Table of Contents must accurately reflect the outline and organization of the thesis. It continues the Roman numeral page numbering sequence.
Lists of Tables and Figures

These lists provide the exact titles and page locations of all illustrative material. These lists continue the Roman numeral page numbering sequence.

The Main Body (format directed by advisory committee)

If appropriate, the following format may be used.

Chapter I

**Introduction**: The introduction should include a clear statement of the student's purpose or hypothesis to be tested, an overview of the problem or subject as it is known from the literature, and a broad statement summarizing the findings of the student's study.

Chapter II

**Literature review**: (Optional by major professor) The literature review should be composed of a comprehensive review of all background knowledge and circumstances pertinent to the subject of the thesis. It should include a thorough discussion and full literature review (normally considered too long for journal articles and other academic publications). Presentation and mastery of this material is a critical component of the student's development as a scholar and it is important to the growth of the discipline. The review should provide a unique and valuable reference resource for other scholars in the field of study.

**Statement of research objectives** (if not explicitly stated in the literature review: This statement should consist of a concise series of specific objectives to be addressed by the research published in the thesis.

Chapter III (IV, V)

**Body of the work** (methods & materials, results and discussion in scientific disciplines): Each of these chapters represents a single manuscript (usually a paper or manuscript submitted or to be submitted to a peer-reviewed scholarly journal). Each manuscript should be written according to the guidelines of the publication or journal to which it was or is to be submitted with the following exceptions.

A. Each chapter should begin with a title page that includes the chapter title and continues with the text. No other information, such as author's names, should be included on chapter title pages. The format for the title page for each chapter should be identical.

B. Tables, figures, and legends (if included) should be of the style, format, and inserted into the chapter(s) in accord with the publication or journal where the manuscript may be sent for consideration for publication.

C. All references to published literature should be cited by author's name(s) and year in one cumulative alphabetical list after the conclusions as described below.

D. Only full papers can be included as a chapter of a thesis. Chapters that have been submitted as rapid publications, short papers, brief reports or letters are not sufficiently detailed for inclusion in the thesis chapter format and must be rewritten as full papers to be included as chapters. The
abbreviated styles accepted by some journals should be expanded to include sufficient detail to replicate the research presented.

E. The inclusion of one or more additional chapters of material, in the format described, that are unlikely to be published separately, is permitted provided that the same rules regarding format are observed.

**Overall conclusion** (if not explicitly stated in the discussion): The discussion/body or last chapter section should be followed by an overall conclusion. The section should be composed of a brief restatement of the important conclusions presented in the thesis. This section is particularly important and should be somewhat longer if a chaptered format is selected as this is the only section that will describe the importance of the work in a comprehensive manner.

**Cumulative bibliography** (if required): A cumulative bibliography should appear in one location at the end of the thesis ahead of any appendices and should be cumulative for all cited references. All citations in the bibliography should be listed alphabetically and should conform to a single format that is accepted as standard within the student’s discipline, as determined by the student's advisory committee (numbered citations in the text are not acceptable). Each manuscript should have its own literature cited as described by the journal.

**Appendices** (as required): Appendices may be included as a means to publish relevant ancillary data or discussion that is not directly related to the unifying theme of the thesis. The majority of such work must still represent the work of the student and can include supporting data, materials or discussion not included in the body/chapters or other work completed by the student that is not included in the main thesis. The format can include individual figures with legends, text alone or whole chapters. The same format rules apply to the rest of the thesis also apply to appendices. Any references included in the appendices should be included in the comprehensive bibliography.

The first page of the main body of the manuscript is numbered with the Arabic 1 and all subsequent pages are numbered with Arabic numerals. These include the Bibliography or other references, and appendices.

**References/Literature Cited**

All theses must include references to document the text in each chapter and in the cumulative bibliography.

**Appendix**

The Appendix consists of material related to the text but not suitable for inclusion in it, such as lengthy tables, figures, documents, and computer printouts. Photographic reduction of material to conform to margin requirements is permitted if the material remains clear and legible.
ILLUSTRATION OF MARGIN REQUIREMENTS

First Page of a Major Division

Major headings such as chapter titles must be below this 2-inch margin.

All material must be inside this 1.5-inch margin.

All material must be inside this 1-inch margin.

Page number and all other material must be above this 1-inch margin with the bottom of the page number as close as possible to the 1-inch margin.

Regular Pages

On regular pages, page numbers and text must be below this 1-inch margin with the top of the page number as close as possible to the 1-inch mark.

All material must be inside this 1.5-inch margin.

All material must be inside this 1-inch margin.

All material must be above this 1-inch margin.
NUTRITIONAL REQUIREMENTS OF BLUE CATFISH (ICHTALURUS FURCATUS)

Except where reference is made to the work of others, the work described in this thesis is my own or was done in collaboration with my advisory committee.

____________________________________
(Student’s Signature)

Certificate of Approval:

____________________________________  _______________________________________
Steven D. Mims, Associate Professor    James H. Tidwell, Chairman
Aquaculture Program                  Professor, Aquaculture Program

____________________________________  _______________________________________
Carl D. Webster, Associate Professor  Paul E. Bibbins, Dean
Aquaculture Program                  Aquaculture Program
College of Arts & Sciences
NUTRITIONAL REQUIREMENTS OF BLUE CATFISH (*ICTALURUS FURCATUS*)

Except where reference is made to the work of others, the work described in this thesis is my own or was done in collaboration with my advisory committee.

____________________________
(Student’s Signature)

Certificate of Approval:

____________________________  ______________________________
Steven D. Mims, Associate Professor  James H. Tidwell, Chairman
Aquaculture Program  Professor, Aquaculture Program

____________________________  ______________________________
Carl D. Webster, Associate Professor  Robert M. Durborow, Associate
Aquaculture Program  Professor, Aquaculture Program

____________________________
Paul E. Bibbins, Dean
College of Arts & Sciences
NUTRITIONAL REQUIREMENTS OF BLUE CATFISH (*ICTALURUS FURCATUS*)

Charles E. Brown

A Thesis
Submitted to
the Graduate Faculty of
Kentucky State University
in Partial Fulfillment of the
Requirements for the
Degree of
Master of Science
in Aquaculture

Frankfort, Kentucky
June 8, 2002
NUTRITIONAL REQUIREMENTS OF BLUE CATFISH \textit{(Ictalurus furcatus)}

Charles E. Brown

Permission is granted to Kentucky State University to make copies of this thesis at its discretion, upon request of individuals or institutions and at their expense. The author reserves all publication rights.

\textit{(Signature of the author)}
Charles E. Brown

\underline{Date}

Copy sent to:

\underline{Name} \hspace{2cm} \underline{Date}

\textit{(c) 2001}
MARVIN BRADLEY NUNN
All Rights Reserved
VITA

Charles E. Brown, son of Frank Lloyd and Ann (Fowler) Scott, was born April 27, 1975, in Selma, Alabama. He graduated from Frankfort High School as Valedictorian in 1993. He attended Lexington Community College in Lexington, Kentucky for two years, then entered the University of Kentucky in September, 1995, and graduated cum laude with a Bachelor of Science degree in Biology in August, 1997. After working as a Laboratory Technician II in Kentucky State University's Aquaculture Program, for two years, he entered Graduate School, Kentucky State University, in September, 1999. He married Lucy Lynn, daughter of Dr. Louie and Evanelle Lynn, on December 27, 1999.
Juvenile Kentucky-strain blue catfish, Ictalurus furcatus, with an average initial weight of 39.0 g, were stocked into 3.5-m$^3$ floating cages at a rate of 250 fish/cage and fed one of three diets. Diets contained either 29, 33, or 38% protein. Fish were fed all they would consume in 40 min for 139 days. There were three replications per diet. At harvest, there were no significant differences ($P > 0.05$) in final individual weight, percentage weight gain, survival, and specific growth rate among treatments and these parameters averaged 127 g, 227%, 97%, and 0.85%/day, respectively. Our study suggests that a non-domesticated strain of blue catfish from Kentucky can be fed a diet with 29% protein when growth in cages. This may allow producers to reduce feed costs and increase profits.
ACKNOWLEDGMENTS

The author would like to thank Dr. John McGuire for assistance with statistical analyses and Jorge Calderon for help with data plotting. Thanks are also due to family members Dale, Adam, and Jonathan for their support during the course of this investigation.
Instructions: The student must apply for graduation the semester/session prior to the actual date of graduation. The deadline for submittal are outlined in the Academic Calendar, in the University Catalogue, and the Schedule of Classes. –The Student must complete section I of this form and submit this application to the division chairperson or dean.
–Approval must be obtained for minors/second majors from the appropriate divisional chairperson.
–The department must complete Sections II, III, and signature portion of section IV of this form and submit to Records & Registration.
–The department must attach a copy of the curriculum checklist with notations of completed, submitted, and waived courses.
–Upon receipt, the Office of Records & Registration will complete the preliminary degree audit and notify the student and department of the status of the Application for Degree.

I. Student Information

SSN# __________________________ Date: ____________

Name: ____________________________________________

Note: Print full name as it is to appear on diploma Advisor Hometown (Required)

Address after graduation:

_________________________________________________________________
Street                          City                                      State       Zip

Degree: ______________________ Catalogue Entry: ______ Catalogue Major: ______ Grad. Date: ______

First Major: __________________________ Minor: _______________ Area of Specialization: __________

Second Major: __________________________ Minor: _______________ Area of Specialization: __________

II. Course in Progress (For transfer courses, identify after course number)

Fall (If applicable) Spring (If applicable) Summer (If applicable)

Prefix & No. Title Hrs. Prefix & No. Title Hrs. Prefix & No. Title Hrs.

Will courses in progress meet the minimum graduation hours required for the degree? Yes _____ No

Have all remedial courses been passed with a grade of C or better? Yes _____ No

III. Requirements (With the above courses, will the applicant complete the following requirements?)

Liberal Studies Requirements:

Complete

Language and Reasoning 18 hrs. Yes No Deficiencies:

Fine Arts, Letters, Hist., IGS 21 hrs. Yes No Deficiencies:

Sciences 12 hrs. Yes No Deficiencies:

Health Education/PE 2 hrs. Yes No Deficiencies:

Whitney Young Core 48 hrs. Yes No Deficiencies:

IV. Signature Section

Student: __________________________________________ Date: ____________

First Major Dept. Head: __________________________ Date: ____________

Second Major Dept. Head: __________________________ Date: ____________

First Minor Dept. Head: __________________________ Date: ____________

Second Minor Dept. Head: __________________________ Date: ____________

Registrar Certification: __________________________ Date: ____________