

Department of Health, Nutrition, and Exercise Sciences

PhD Exercise Science and Nutrition

Graduate Student Handbook

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Table Contents

Welcome and Introduction	3
HNES Graduate Programs	3
Diversity, Equity, and Inclusion	3
PhD in Exercise Science and Nutrition.....	4
PhD Advisors	4
PhD Curriculum	4
PhD Program Requirements-Entering with a Master’s/Equivalent Degree	5
PhD Program Requirements-Entering with a Bachelor’s Degree.....	6
Examples of Common Electives Courses (regardless of initial entry status).....	7
Additional Course Information	7
Courses Numbered:.....	7
Transfer of Credits	7
Bachelor's to doctoral students.	7
Master’s to doctoral students.....	8
Academic Requirements	9
Credit Load.	9
Tri-College.....	9
Continuous Enrollment/Leave of Absence.....	9
PhD Progress and Assessment	10
Residence Requirement for PhD Students	10
Comprehensive Examinations	10
Written Comprehensive Examination.....	10
Oral Comprehensive Examination.....	10
Doctoral Dissertation Proposal	11
Table 1. Example Table of Contents/Organization for Dissertation Proposal*.....	12
Doctoral Dissertation Final Document	13
Table 2. Example Table of Contents/Organization for Final Dissertation Document*	14
Final Doctoral Dissertation Defense	15
Timelines and Forms	16
Frequently Asked Questions	18
Which classes are online in the PhD curriculum?	18
Can I do my PhD 100% online?	18
Appendix A. HNES Course Rotations	19
Appendix D. MS Exercise/Nutrition Science Course Objectives	22
Appendix A- Document Revision Log	29

Welcome and Introduction

Welcome to the graduate programs offered by the Department of Health, Nutrition, and Exercise Sciences (HNES). The information provided in this document is designed to help you understand some procedures in HNES. Graduate students should also consult with the [NDSU Graduate Handbook](#) for further clarification on requirements. In addition, please consult with the NDSU [Academic Calendar](#) for specific dates that may be important for completing your degree on time. If you have questions at any point in this document please consult with your advisor and/or contact the HNES Graduate Coordinator. The current HNES Graduate Coordinator contact information is below:

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HNES Graduate Programs

The Department of HNES offers a Master of Science (MS) degree in Health, Nutrition, and Exercise Sciences with one option: 1) Exercise/Nutrition Science and an online MS degree in Dietetics through Great Plains Interactive Distance Education Alliance. Additionally, there is one degree path available for those students planning on pursuing athletic training: Master of Athletic Training (MATrg). The department also offers a PhD degree in Exercise Science and Nutrition.

Diversity, Equity, and Inclusion

The Department of Health, Nutrition, and Exercise Sciences is committed to fostering, cultivating and preserving a culture of diversity, equity and inclusion. The collective sum of the individual differences, life experiences, knowledge, inventiveness, innovation, self-expression, unique capabilities and talent that our students invest in their work represents a significant part of not only our culture, but our reputation as a Department, College, and University at North Dakota State University.

We embrace and encourage our students' differences in age, color, disability, ethnicity, family or marital status, gender identity or expression, language, national origin, physical and mental ability, political affiliation, race, religion, sexual orientation, socio-economic status, veteran status, and other characteristics that make our students unique.

Student resources: Diversity, equity, inclusion

<https://www.ndsu.edu/news/view/detail/61605/>

PhD in Exercise Science and Nutrition

The purpose of this handbook is to familiarize you with how to complete the requirements needed for the PhD degree in Exercise Science and Nutrition. The PhD degree in Exercise Science and Nutrition prepares the graduate for advanced positions in industry and academia. The department is devoted to researching and understanding the long-term effects of exercise programming, physical activity, and nutrition, and translating this research into effective exercise/nutrition science and wellness programs for children, adolescents, and men and women of all ages, as well as athletes. This option is appropriate for dietetics, nutrition, kinesiology, and exercise science graduates or related fields.

PhD Advisors

Graduate Faculty eligible to mentor students in the PhD degree in Exercise Science and Nutrition are: [Dr. Bryan Christensen](#), [Dr. Shannon David](#), [Dr. Nathan Dicks](#), [Dr. Marty Douglas](#), [Dr. Julie Garden-Robinson](#), [Dr. Kyle Hackney](#), [Dr. Elizabeth Hilliard](#), [Dr. Seugmin Kang](#), [Dr. Ryan McGrath](#), [Dr. Yeong Rhee](#), [Dr. Kelsey Slater](#), [Dr. Sherri Stastny](#), [Dr. Brad Strand](#), [Dr. Joel White](#), [Dr. Joshua Wooldridge](#), and [Dr. Matt Drescher](#) .

In the letter notifying an applicant of admission, the Graduate School will identify an individual in HNES whom the applicant should contact as their PhD advisor. This person can help you select your courses, facilitate research opportunities, as well as serve as the committee chair for your comprehensive examinations and dissertation. Students may change their advisor at any time prior to proposing their dissertation. If students change their assigned advisor, they should inform their former advisor. If a plan of study was previously submitted, the [Request to Form or Change Supervisory Committee](#) form needs to be completed and sent to the graduate school.

PhD Curriculum

Upon entry to the PhD Exercise and Nutrition program, students should consult with their advisor and work to complete the recommended course work as shown below. The course work in the department will vary based on whether a student is enrolling with a master's/equivalent level degree (60 credits required) or an undergraduate degree (90 credits required). In addition to course work, the passing of written and oral comprehensive examinations, a doctoral dissertation proposal, and a doctoral dissertation defense is required. These items are discussed later on the document after the curriculum path requirements. HNES course rotation schedule is shown in Appendix A.

PhD Program Requirements-Entering with a Master's/Equivalent Degree

Curriculum (60.0 credit minimum, if already holding a Master's/Equivalent degree)

Research Core: (12.0 credit hours)

- 1) STAT 725 Applied Statistics
- 2) 9.0 additional credits in statistics and research methodology

Recommended HNES Core: (9.0 credits)

- 1) HNES 713 Graduate Exercise Physiology
- 2) HNES 726 Nutrition in Wellness
- 3) HNES 777 Scholarly Writing and Presenting in HNES

Electives (18.0 credits, up to 6 credits outside of HNES)

- HNES 668 Leadership and Communication in Dietetics
- HNES 642 Community Health and Nutrition Education
- HNES 703 Graduate Biomechanics of Sport and Exercise
- HNES 704 Psychological Foundation of Sport & Physical Activity
- HNES 710 Introduction to Research Design and Methods in HNES
- HNES 724 Nutrition Education
- HNES 727 Physical Activity Epidemiology
- HNES 735 Nutrition for Human Performance
- HNES 743 Obesity Across Lifespan
- HNES 754 Assessment in Physical Activity and Nutrition
- HNES 760 Skeletal Muscle Physiology
- HNES 761 Physiological and Fitness Assessment in Exercise Science
- HNES 762 Exercise Endocrinology
- HNES 790 Graduate Seminar- Intro to HNES (1 credit)
- HNES 791 Special Topics (variable credit)

Research Practicum: (minimum of 3.0 credits)

- HNES 794 and/or 894 Practicum/Internship

Teaching Practicum: (minimum of 3.0 credit hours)

- HNES 792 and/or 892 - Graduate Teaching Experience

Dissertation: (15.0 credits)

- Must encompass at least two separate semesters

Curriculum (90.0 credit minimum)

Research Core: (18 credit hours)

- 1) STAT 725 Applied Statistics
- 2) HNES 710 Introduction to Research Design and Methods in HNES
- 3) 12.0 additional credits in statistics and research methodology

Recommended HNES Core: (9.0 credits)

- 1) HNES 713 Graduate Exercise Physiology
- 2) HNES 726 Nutrition in Wellness
- 3) HNES 777 Scholarly Writing and Presenting in HNES

Electives (33.0 credits, up to 6 credits outside of HNES)

- HNES 668 Leadership and Communication in Dietetics
- HNES 642 Community Health and Nutrition Education
- HNES 703 Graduate Biomechanics of Sport and Exercise
- HNES 704 Psychological Foundation of Sport & Physical Activity
- HNES 710 Introduction to Research Design and Methods in HNES
- HNES 724 Nutrition Education
- HNES 727 Physical Activity Epidemiology
- HNES 735 Nutrition for Human Performance
- HNES 743 Obesity Across Lifespan
- HNES 754 Assessment in Physical Activity and Nutrition
- HNES 760 Skeletal Muscle Physiology
- HNES 761 Physiological and Fitness Assessment in Exercise Science
- HNES 764 Advanced Cardiovascular Exercise Physiology
- HNES 762 Exercise Endocrinology
- HNES 777 Scholarly Writing and Presenting in HNES
- HNES 790 Graduate Seminar-Introduction to HNES (1 credit)
- HNES 791 Special Topics (variable credit)

Research Practicum: (9-12 credits)

-HNES 794 and/or 894 (must be taken over at least two separate semesters)

Teaching Practicum: (3.0-6.0 credit hours)

-HNES 792 and/or 892 - Graduate Teaching Experience

Dissertation: (15.0 credits)

-Must encompass at least two separate semesters

Examples of Common Electives Courses (regardless of initial entry status)

Statistics course options:

HDFS 705: Quantitative Methods in Developmental Science
STAT 662: Intro to Experimental Design
STAT 663: Nonparametric Statistics
STAT 670: Statistical SAS Programming
STAT 726: Applied Regression Analysis
STAT 730: Biostatistics
STAT 764: Multivariate Methods

Research Methods course options:

EDUC 779 Survey Research
HDFS 758 Longitudinal Research Methods and Analysis
HDFS 790 Problems in Research Methods
MICR 674 Epidemiology
PSYC 640 Experimental Methods
PSYC 762 Advanced Research Methods and Analysis
PSYC 771 Social/Health Psychology Research
SOC 700 Qualitative Methods
SOC 701 Quantitative Methods

Other Electives options:

COMM 702 Introduction to College Teaching
HDFS 702 Teaching Developmental Science
NURS 630 Advanced Community Assessment
PSYC 681 Health Psychology
Or other courses as approved by Major advisor and committee

Additional Course Information

Students should consistently progress through the credits needed to graduate and know all prerequisites for their individual graduate studies. Tentative course schedules are provided to help students schedule their courses as they progress toward completion of the degree. Most HNES graduate courses are offered on a two-year rotation (Appendix A). Please also consult with the [Graduate School Bulletin](#) for the most up to date changes.

Courses Numbered: 600/700/800 may be taken for graduate credit in the student's field of study. Courses not listed in the Bulletin of the Graduate School may not be taken for credit toward the PhD degree. All prerequisites must be met before a student can take a 600/700/800 level graduate class or instructor permission must be granted.

Transfer of Credits: All graduate credits used to meet the requirements of a doctoral degree must be approved by the supervisory committee, the graduate program leader, and the Dean of the Graduate School.

Bachelor's to doctoral students. The doctorate requires a minimum of 90 graduate credits. A minimum of 27 credits of didactic coursework are required; no more than 15 didactic credits may be transferred as part of the

Plan of Study. All transfer credits for students with a bachelor's degree working toward a doctoral degree at NDSU.

- Must be graduate-level course work from regionally accredited colleges or universities (or equivalent for international institutions) to be eligible for acceptance in transfer;
- Must be approved in a Plan of Study by the supervisory committee, the graduate program leader, and the Dean of Graduate Studies;
- Must not be courses graded Pass/Fail or Satisfactory/Unsatisfactory;
- Must carry only grades of A or B on a 4-point scale;
- Must have been earned no more than 10 years prior to graduation with a doctoral degree at NDSU;
- Must not be a continuing education, correspondence, extension, or workshop course;
- Must not be internship, individual study, special problem, or research (disquisition) courses;
- Must not have been used to fulfill the requirements of a previous baccalaureate or master's degree (with the exception of accelerated master's degrees);
- Must be verified by an official transcript; and
- Will not be used in calculation of the grade point average.

Master's to doctoral students. The doctorate requires a minimum of 60 credits beyond the master's degree; therefore, no more than 30 credits from a previously earned master's degree may be transferred into a doctoral program at NDSU, except where expressly allowed by policy or transfer agreement. The previous master's degree must be meaningfully related to the discipline in which a doctoral degree is pursued.

In addition to a maximum of 30 credits applied toward an earned master's degree, transfer of up to 15 credits from another doctoral program in the same or a meaningfully related discipline from an accredited doctoral institution can be allowed in individual cases, for a total of 45 transfer credits. Strict limitations apply. Approval from the supervisory committee, the graduate program leader, and the Dean of Graduate Studies is required as part of an approved Plan of Study.

All transfer credits in addition to the 30 for a prior master's degree for students working toward a doctoral degree at NDSU

1. Must be doctoral-level coursework in the same or a meaningfully related discipline from a doctoral program offered by a regionally accredited university (or equivalent for international institutions) to be eligible for acceptance in transfer;
2. Must be approved in a Plan of Study by the supervisory committee, the graduate program leader, and the Dean of Graduate Studies;
3. Must not be courses graded Pass/Fail or Satisfactory/Unsatisfactory;
4. Must carry only grades of A or B on a 4-point scale;
5. Must have been earned no more than 10 years prior to graduation with the doctoral degree at NDSU;
6. Must not be a continuing education, correspondence, extension, or workshop course;
7. Must not be internship, individual study, special problem, or research (disquisition) courses;
8. Must be verified by an official transcript; and
9. Will not be used in calculation of the grade point average.

Notes:

1. The petition for transfer of credits is part of the development process for the Plan of Study. Individual courses at the master's or doctoral level that have been accepted in transfer have to be listed in the transfer credit section of the Plan of Study, and they are to be counted toward the required credit total for the Plan of Study.

If 30 credits are accepted in transfer from a previously earned master's degree into a doctoral degree

program, the accepted master's degree is listed in the header for the Plan of Study, and the Plan of Study lists only the required courses beyond the master's degree (for a minimum of 60 credits). If individual doctoral credits are accepted for a doctoral degree at NDSU, these additional courses need to be listed in the transfer credit section of the Plan of Study, and they are to be counted toward the required total for the Plan of Study.

2. It is the responsibility of the student to provide official transcripts of graduate courses taken elsewhere to the Graduate School.
3. Departments and programs have the right to further restrict or completely eliminate acceptance of transfer credits for their degree programs. Prospective students are encouraged to contact the respective academic department or the Graduate School for information on exceptions to this graduate credit transfer policy.

Time Limitation. Graduate credit for any coursework that is more than 10 calendar years old at the time of the final examination cannot be used to satisfy degree requirements unless a petition for exception was approved. The final examination is valid for one year. Should a student not have his/her disquisition approved by the Graduate School or fail to meet other degree requirements within that timeframe, the final examination must be retaken. If a period of time two years or greater lapses before the disquisition is approved by the Graduate School, the student must reapply, re-defend the dissertation and must register for a minimum of two (2) credits. The student's degree will post at the end of the semester in which the disquisition is approved by the Graduate School.

Academic Requirements. "To be in good standing and to receive a graduate degree, a student must maintain a cumulative grade point average of 3.0 or B." (Graduate Bulletin, General regulations)

Credit Load. Nine credits are considered a full-time graduate load (even with a 10 hour graduate assistantship). Graduate teaching assistants in half-time status (20 hours per week) are considered full-time if registered for five or more graduate credits.

Tri-College. Graduate students may take courses offered at Minnesota State University Moorhead or Concordia College for credit toward a degree. The courses, however, must be listed as graduate courses and approved by the supervisory committee and the Department Head, as well as being listed on the plan of study when it is submitted.

Continuous Enrollment/Leave of Absence.

- Students are required to register for at least one credit each semester (fall and spring) until all degree requirements are completed, including Graduate School approval of the thesis, paper, or dissertation. Students taking their final examination in the summer semester must register for summer semester.
- Degree approval will be delayed until a student registers for one credit for each fall and spring semester in which he/she was not enrolled and not on a Leave of Absence, up to four (4) credits.
- A student who has not registered for longer than a continuous two-year period must also reapply for admission and is subject to the degree requirements at the time of readmission.
- Students who interrupt their graduate program prior to the completion of all degree requirements must obtain a leave of absence, using the [Request for Leave of Absence](#) from Graduate Studies form. A leave may be taken for up to two (2) years at which time a student must reapply to the Graduate School. NOTE: Leaves of absence do not amend in any way the ten-year time limitation.

PhD Progress and Assessment

Each fall the HNES Graduate Coordinator will initiate assessment of the progress of students in the program. These will be completed online via Qualtrics with the appropriate link sent via email by the graduate coordinator. The assessment will track your continued progress toward completing course work, major milestones, and well as scholarly activity. You will be provided with a copy of the assessment document and a copy will be sent to your advisor. Complete and accurate responses to the PhD assessment request is required for the PhD program.

Residence Requirement for PhD Students

Graduate study for the Doctor of Philosophy degree normally requires a minimum of three (3) years of full-time study beyond the baccalaureate degree. **A student who has a master's degree or equivalent must devote at least one of the two remaining academic years of study in residence at North Dakota State University. See NDSU graduate policy.** <https://bulletin.ndsu.edu/graduate/graduate-school-policies/doctoral-degree-policies/> . Information on the requirement will be monitored in the PhD Progress and Assessment document. If you fail to meet this requirement your progression from PhD student to PhD candidate may be delayed.

Comprehensive Examinations

All PhD students must pass written and oral comprehensive examinations to advance from a PhD student to a PhD candidate. Once a PhD candidate, the student may propose their doctoral dissertation to their approved dissertation committee. Specific procedures have been developed for the comprehensive written and oral examination shown below. It is each student's responsibility to be familiar with and to follow the procedures. **Note-Students should plan to hold their proposal and defense dates during the academic school year as faculty are typically not available during the summer months.**

Written Comprehensive Examination

The written comprehensive examination involves writing a comprehensive review of literature in their research area of interest. In general, this is your work, however, you will often consult your advisor on the document content. The format should adhere to the NDSU general requirements for doctoral dissertations. These are discussed in HNES 710 can be viewed here: [Graduate school formatting requirements](#).

Oral Comprehensive Examination

The oral comprehensive examination involves talking through their paper in front of their committee members. This can be completed using a visual platform such as PowerPoint or a more informal discussion. Consult with your PhD advisor on their preferred method. **Note- At least two weeks in advance of the date complete the: [Notification of scheduled examination form](#). Also, please send a copy of your literature review to your committee at least 7 days in advance of your oral comprehensive exam date.**

The oral comprehensive examination procedures generally involve:

- 1) Introductions of committee members and student.
- 2) Explanation of the comprehensive examination process for HNES by the committee chair. Note- the student may be asked to leave the room (optional) at this stage. The HNES process is generally below:
 - The purpose of the written and oral comprehensive examination for HNES is to determine whether the student is an “expert” in the literature/has the background knowledge in his/her area of research and if we feel the student is someone we would want to graduate from our program.
 - A broad based written literature review is used as the basis for the oral comprehensive examination.
 - The student is asked questions regarding the information in their paper to determine strength of knowledge and professional ability to appropriately answer questions.

- The committee can also give suggestions on areas that should be added to the paper or modified.
- After about 1-1.5 hours, the student is asked to leave so the committee can discuss the student's performance.
- Overall, did the student have sufficient expertise in his/her area and how was his/her performance during the comprehensive examination?

Doctoral Dissertation Proposal

Upon passing the oral and written comprehensive examinations, the PhD student is now given the title of PhD candidate. With this milestone, they are now eligible to propose their doctoral dissertation. Preparation of a research proposal is an important writing experience. The purpose of a research proposal is to provide your supervisory committee with sufficient information to decide if the proposed research is needed and is likely to be fruitful. In order to accomplish that goal, the proposal should: 1) present the logical need for conducting the proposed piece of research, 2) provide an analysis of the most important past research as a context for the proposed study, 3) specify the objectives and/or the hypotheses or research questions, and 4) outline the basic procedures to be followed. The proposal provides a statement of agreement between you and your committee as to the minimum expected for the dissertation research. Enough detail should be provided, so the committee can be certain that the student is aware of the relevant prior research, detect any of the student's misconceptions, and identify potential errors in the proposed study. You will, of course, in consultation with your advisor, fill in details, often expanding on the anticipated procedures, as you conduct the research.

The following sequence of suggested sections for a dissertation proposal reflects a basic logic of investigation, from intellectual uncertainty to plan of action. The sections are those essential to an adequate proposal, although some advisors may prefer a different order. The general structure may need to be modified depending upon the particular type of research problem being addressed by the student.

For all research proposals, there should be an "Introduction" that includes a "Statement of the Problem", "Review of Literature", and a "Methodology or Procedures" section appropriate to the type of research to be conducted. Without these, it is difficult for the committee to anticipate what you plan to do, to help guard against potential errors of inappropriate approaches, and to judge when you have completed the agreed-upon project. There are different formats that can be used – check with your advisor to determine which one you should use. Most advisors prefer the manuscript format organization which is shown below (Table 1). You should be familiar with the current documents providing information for this formatting. The proposal must be written in present or future tense and the table of contents/organization similar to Table 1. This structure is discussed in detail in HNES 710. Please use the NDSU Graduate School [templates](#) to get the most updated recommendations.

Table 1. Example Table of Contents/Organization for Dissertation Proposal*

CHAPTER 1. INTRODUCTION [HEADING 1- MS Word in automated table of contents]
Statement of the Problem [HEADING 2- MS Word in automated table of contents]
Purpose of the Study
Objectives, Hypothesis, or Research Questions
Significance of the Study (optional)
Limitations and Delimitations of the Study
Assumptions of the study
Organization of Remaining Chapters (optional)
Definition of Terms

CHAPTER 2. REVIEW OF LITERATURE
Purpose of the Study
Introduction (by rephrasing the statement of the problem in Chapter 1 to fit focus)
Body (by subdivision/topics following sequence set by statement of the problem)
Summary (of literature findings in order set by statement of the problem)

CHAPTER 3. METHODOLOGY
Purpose of the Study
Introduction (by rephrasing the statement of the problem in Chapter 1 to fit focus)
Population Sample and Sampling Procedures
Data Collection (instrument, description, reliability, validity and how determined)
Procedures
Research Design
Statistical Analysis

*Note- there may be some variability in mentor preferences of what is included. These recommendations are in line with NDSU Graduate School [templates](#).

Chapter 1. Introduction

This section provides a short introduction to the research being proposed and provides the parameters under which the study will be completed. The identification of a problem provides the logical foundation upon which the rest of the proposal is built. This section should include a one-or two- sentence statement of the general purpose of the research, followed by a list of specific objectives to be accomplished by the research. These outcomes should be stated as outcomes, not as procedures.

Following the objectives, the hypotheses or research questions that guide the study are listed, sometimes in a separate section. Research questions may be used rather than hypotheses. Next, a section of definition of terms used in the research is provided. A listing of the limitations of the research will be added at the conclusion of the study. Finally, it is often helpful to include toward the end of the problem section a one-or two-sentence synopsis of the research problem.

Chapter 2. Review of Literature

The review of literature involves planning, conducting, and explaining an exhaustive search for research and publications that relate to the problem discussed in the introduction. After relevant sources are located, the student reads and makes notes on each source and then prepares a report that defines the problem and indicates

how the review of the literature helps to address the problem. The review should be critical in nature, and based, preferably, on a systematic model for recording and analyzing information from professional research journals, books, and reports. It should result in conclusions or provide direction with respect to the identified problem.

In the review of literature, the study is placed in context through a critical analysis of selected studies that should: 1) pull together findings to provide a "state-of-knowledge" summary in regard to the research problem and provide additional evidence in regard to the nature and/or the importance of the problem underlying the study; 2) make clear how further research should extend, differ from, or replicate past studies, including the identification of the critical variables in the problem area and important hypotheses to be tested; 3) indicate shortcomings in the design of prior research that should be avoided and/or strengths to be repeated in conducting another study; and 4) where there are methodological alternatives, especially controversial ones, critique the literature that is relevant to making a choice. This section is not intended to be a complete presentation of the comprehensive review of related literature that has been done prior to writing the proposal. Only those studies that are directly pertinent to structuring the proposed research should be discussed briefly, in order to assure the student's committee that major studies and/or issues have not been overlooked.

Chapter 3. Methodology

The methods and procedures section of the proposal is an explanation of the specific steps to be followed in meeting the objectives and in testing the hypotheses or answering the questions posed in the prior sections. An introduction describing the purpose of the research is included. The procedures to be followed in the present research should take into account the major criticisms of or comments on prior research in the review of literature section. A chronological listing of major procedural steps is often useful. The following subsections will usually be included in the procedures section: population sample, data collection and instrumentation, procedures, research design, and statistical analysis.

Doctoral Dissertation Final Document

After your proposal has been approved by your supervisory committee and regulatory entities (IRB/IACUC/IBC), you will conduct your research. After gathering your data, you will prepare your final product. This final product is generally presented in article format (Table 2). The first three chapters of your dissertation will be the same as presented in the proposal with the exception of minor changes by your committee or the addition of new pertinent research. All material in the first three chapters must be changed to past tense in the final thesis. The table of contents/organization should look similar to the information in Table 2 if using manuscript format. If you or your mentor prefer traditional format please consult with the NDSU Graduate School.

Chapter 4. Manuscript 1

The introduction, methods, results, and discussion of a study are presented in relation to the **most pertinent research questions** posed in chapter 1, usually with the assistance of figures/tables. This is a full manuscript prepared for an academic journal, however, the referencing style should remain consistent with the whole dissertation.

Chapter 5. Manuscript 2

The introduction, methods, results, and discussion of a study to **other pertinent questions** posed in chapter 1, usually with the assistance of figures/tables. This is a full manuscript prepared for an academic journal, however, the referencing style should remain consistent with the whole dissertation.

The table of contents for a dissertation prepared using the article should look similar to Table 2. **Some variability based on mentor preference and template used may be accepted, but below is consistent with the NDSU Graduate School [templates](#).** Note that tables and figures that are repeated in the dissertation should be numbered consecutively. For example, a table in the methods section of Chapter 3 that is numbered Table 2 should also be numbered Table 2 in the methods section of the manuscript (Chapter 4 or 5). Although there are several manuscripts presented in the final dissertation it should flow as one large document with a full references at the end. Consult with your advisor for examples of previous dissertations in HNES. This structure is discussed in detail in HNES 710. Please use the NDSU Graduate School [templates](#) to get the most updated recommendations.

Table 2. Example Table of Contents/Organization for Final Dissertation Document*

ABSTRACT

ACKNOWLEDGMENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1. INTRODUCTION [[HEADING 1- MS Word in automated table of contents](#)]

Statement of the Problem [[HEADING 2- MS Word in automated table of contents](#)]

Purpose of the Study

Objectives, Hypothesis, or Research Questions

Significance of the Study (optional)

Limitations and Delimitations of the Study

Assumptions of the study

Organization of Remaining Chapters (optional)

Definition of Terms

CHAPTER 2. REVIEW OF LITERATURE

Purpose of the Study

Introduction (by rephrasing the statement of the problem in Chapter 1 to fit focus)

Body (by subdivision/topics following sequence set by statement of the problem)

Summary (of literature findings in order set by statement of the problem)

CHAPTER 3. METHODOLOGY

Purpose of the Study

Introduction (by rephrasing the statement of the problem in Chapter 1 to fit focus)

Population Sample and Sampling Procedures

Data Collection (instrument, description, reliability, validity and how determined)

Procedures

Research Design

Statistical Analysis

CHAPTER 4. MANUSCRIPT 1

Introduction (summary of Chapters 1 and 2)

Methods (summary of Chapter 3)

Results

Discussion

CHAPTER 5. MANUSCRIPT 2

Introduction (summary of Chapters 1 and 2)

Methods (summary of Chapter 3)

Results

Discussion

CHAPTER 6. SUMMARY & RECOMMENDATIONS FOR RESEARCH

REFERENCES (all references used in the dissertation)

*Note- there may be some variability in mentor preferences of what is included. These recommendations are in line with NDSU Graduate School [templates](#).

Final Doctoral Dissertation Defense

All final doctoral defenses are made public and faculty, students, and staff are invited to participate. Defenses may also be recorded via zoom or other technologies. The examination (defense) format generally follows what is below (times listed are suggestions only):

- Student may be excused from the room while committee has preliminary discussion - up to 5 minutes.
- Duration of the student presentation - up to 40 minutes.
- Questions from the public, faculty, staff, or other students – up to 10 minutes.
- Public, faculty, and other students may be dismissed at this point.
- Questions from the defense committee - up to 30 minutes.
- Committee deliberation - up to 20 minutes. The student is excused from the committee's deliberations.
- Student advised of outcome by the defense committee chair.

Your presentation should be conducted as an oral research presentation. The times noted are suggested to help you discuss what you need to do in the 30-40 minutes that you are to present. You will begin with an introduction that cites a few important studies followed by the statement of the problem/research questions. Next, discuss your research methods and procedures and your results. Finally, finish your oral presentation with a discussion of your findings. Your 30-40 minute oral presentation is followed by questions from the public, faculty, staff, or other students and your committee.

Questions and concepts a student should be prepared to answer during the oral examination include:

- Questions about the paper.
- Questions about the student's plan of study and coursework.
- Questions regarding the statistical terms and the statistical analysis used in the study.
- Questions regarding the type of research methods used in the study.

Basis for Evaluation for pass or fail:

- Demonstrates scholarly writing using Graduate School guidelines for disquisitions;
- Integrates existing research and theory with own project or study and makes appropriate conclusions;
- Indicates an understanding of the scientific process;
- Clear articulation of the study and contribution to the field;
- Ability to defend one's work during the oral examination.

If you are unsuccessful at your defense, please consult with our advisor and the [NDSU Graduate Handbook](#). With permission of a majority of the supervisory committee members, a candidate is allowed to take each examination twice. The supervisory committee will set a date at least one month after the failed examination. Should both attempts to pass an examination result in failure, the candidate may request to take the examination a third time. A request for a third examination requires the support of the supervisory committee and program administrator, and the approval of the Dean of the Graduate College after consultation with the Graduate Council

Upon passing your final defense, a copy of your dissertation submitted to your supervisory committee is considered a draft, which is subject to changes the supervisory committee and the HNES Department Head require. Such changes could involve rewriting major sections. After the final defense, you will incorporate into the dissertation corrections suggested at the final oral defense and the HNES Department Head.

You have one year from the date of the final examination to send the dissertation to The Graduate School and complete all other degree requirements. Should the disquisition not be deposited as specified or any other degree requirements not be completed, the student must retake the final examination. If a period of two years or greater has lapsed before the final copies are submitted, the student must reapply to The Graduate School and must register for a minimum of two credits. Degree date is based on the date when final copies are submitted to The Graduate School.

Please note other key deadlines, timelines, and forms below as you proceed through the PhD degree. A summary of the flow of events and important links are also below.

Timelines and Forms

1. Once you have been accepted to the graduate school and the Department of Health, Nutrition and Exercise Sciences, visit with your assigned PhD advisor and review the program curriculum and select your courses. Timelines vary per student but it is generally expected that the degree can be completed in 3-5 years.
2. In the first year or two of your academic work, develop a preliminary plan of study in consultation with your PhD advisor. This should estimate what classes you will take to complete your degree. Consult with your advisor on an example plan of study. Class rotation list on the website can aid in this effort which is shown in Appendix A.
3. Generally, by year two and in consultation with your advisor, select additional members to serve on your dissertation. You need at least four members on your committee for the PhD degree and they must have specific graduate level status. In general, you must have:
 - Your PhD advisor as the committee chair.
 - A second member, who must be a full or affiliate member of the HNES graduate faculty.
 - A third member, who could be either a faculty member from outside the student's program or a qualified off-campus expert in the field. If this committee member is not a full or affiliate member of the graduate faculty, the approval of the Dean of the Graduate College is required. Approval by the Dean requires a memo from the program/department chair explaining the qualifications of the person to be on the committee and the person's curriculum vitae.
 - A fourth member, the Graduate School Representative (GSR) The role of the GSR is to ensure policies are followed, expectations for the student's performance are reasonable and interactions with the supervisory committee are conducted in a professional manner. THE GSR MUST BE a full member of the graduate faculty, AND be either a tenured faculty member outside the committee chair's/co-chairs' home department(s) OR a faculty member outside the primary college of the committee chair/co-chairs. If the student is in an interdisciplinary program, the GSR must also be outside of that program.

Please explore the committee requirements provided by [NDSU Graduate Handbook](#) to assure the appropriate committee is created.

4. Submit the formal plan of study to the Dean of the Graduate School for approval no later than the term immediately after the supervisory committee is formed. An example Plan of Study is shown in Appendix A, but the official submission must be made [PhD Plan of Study Page](#).
5. Complete the courses listed on the plan of study with B or better grade. Maintain continuous enrollment through completion of the degree or file [Leave of absence forms](#) from the Graduate School.
6. Register for HNES 899 Doctoral Dissertation. Complete the appropriate contract located at the “NDSU Graduate Program Blackboard” page with the help of your advisor, prior to registration.
7. In consultation with your advisor, prepare a draft of your written comprehensive examination using [templates](#) provided by the graduate school.
8. In consultation with your advisor, prepare your oral comprehensive exam presentation.
9. Schedule your oral comprehensive examination with your committee members. Plan ahead to assure their availability. Submit [Notification of Scheduled Examination](#) form. **The form must be submitted to the Graduate School at least two weeks prior to the examination date.** If your examination date is less than two weeks from today, you will need to reschedule as your form will not be processed. Fill in the name and email for each signing role listed below. If you are unsure as to who your Graduate Program Coordinator is, consult your department. Signers will receive an email inviting them to sign this document.
10. Please send a copy of your Chapter 2- Literature review to your committee at **least 7 days in advance of the oral comprehensive examination date.**
11. Upon passing your written and oral exams and approval of your advisor on the scope of your dissertation project, schedule a proposal meeting with your committee. **All committee members should receive a copy of your proposal at least 7 days prior to the meeting.** No additional documentation is required to be submitted to the graduate school for the proposal.
12. Upon approval by your committee submit paperwork to [NDSU's Institutional Review Board \(IRB\)](#) or other compliance requirements, if necessary. You will need to complete the online [CITI](#) training for Human Subjects Protection –This must be completed before you can begin your research and before you receive IRB approval. You may begin your research after you receive approval from IRB.
13. Complete your research and format the final doctoral dissertation consist with the guidelines shown in this handbook.
14. With advisor approval, consult with the NDSU graduate school webpage and complete “Step One” activities including the submission of “intent to graduate” the graduate school website before the deadline. https://www.ndsu.edu/gradschool/current_students/graduation
15. At the completion of your research and upon approval of your advisor, you may schedule the final oral examination (defense). The [Notification of Scheduled Exam](#) **form must be submitted to the Graduate School two weeks prior to the examination.**
16. **Committee members must receive a copy of your completed dissertation at least 14 days prior to the meeting. The HNES Department Head must read your updated dissertation and approve before it is sent to the Graduate School.** It is helpful to send the Department Head a copy of the dissertation when you send it to your committee.

17. Defend your dissertation work. At this meeting you will orally explain and defend your research. The examining committee will immediately report, in writing, the results of the examination to you. Consult with your advisor on the next step.
18. If ready to graduate, complete “Step two” of the preparation for graduation requirements with your advisor which include: submitting report of final examination, submitting IRB/IACUC/IBC compliance, complete all revisions required by committee, disquisition approval page, and make \$175 disquisition fee payment. https://www.ndsu.edu/gradschool/current_students/graduation
19. Upon final approval by the advisor and Department Head, complete “Step three” activities and submit one draft of the dissertation to the Graduate School for approval via the NDSU graduate school [online submission](#) system.
20. Consult with the “graduation frequently asked questions (FAQs)” page to assure everything is completed and formatted correctly.
21. If NDSU graduate school corrections are required, edit, and resubmit to the Graduate School as needed. Submit the final disquisition to the Graduate School office no later than one year after the oral defense. Failure to do so, results in another oral defense. If you want to graduate the semester you finish, there are additional timelines that must be met.
22. If you are unsuccessful at your defense, please consult with our advisor and the [NDSU Graduate Handbook](#). With permission of a majority of the supervisory committee members, a candidate is allowed to take each examination twice. The supervisory committee will set a date at least one month after the failed examination. Should both attempts to pass an examination result in failure, the candidate may request to take the examination a third time. A request for a third examination requires the support of the supervisory committee and program administrator, and the approval of the Dean of the Graduate College after consultation with the Graduate Council.

Frequently Asked Questions

Which classes are online in the PhD curriculum?

It is not feasible to have complete list of courses that 100% online, hybrid, hyflex, or in person as they change each year with course content, technology improvements on campus, and changes in instructors. Please check campus connection or email the course instructor for the proper information.

Can I do my PhD 100% online?

No. There is a residency requirement through the NDSU graduate school. At least one year must be completed at NDSU in the local area. Consult with your advisor if you are planning to not be in the area for a period of time to determine if it is possible to continue in the program or if a leave of absence is required.

<https://bulletin.ndsu.edu/graduate/graduate-school-policies/doctoral-degree-policies/>

Appendix A. HNES Course Rotations

A general list of the HNES course rotation schedule is shown in the pages to follow. This is for planning purposes only. HNES may make changes to the scheduled rotations. The updated plan will be available each semester as soon as it is known.

HNES Graduate Course Rotations (Fall 2021- Summer 2026)

		MS Exercise/Nutrition Science Option PhD Exercise Science and Nutrition															
Course #	Class Delivery		F21	Sp22	Su22	F22	Sp23	Su23	F23	Sp24	Su24	F24	Sp25	Su25	F25	Sp26	Su26
642/L	In person	Community Health and Nutrition Education/Lab	X			X			X			X			X		
668	In person	Leadership and Communication in Dietetics	X			X			X			X			X		
703	In person	Graduate Biomechanics of Sport and Ex.	X						X						X		
704	Online	Psychological Foundations of Sport and Physical Activity (online)				X			X			X			X		
710	Hybrid	Introduction to Research Design and Methods in HNES (GPIEDA SECTION NOT ALLOWED)	X			X			X			X			X		
713	In person	Graduate Exercise Physiology		X						X						X	
724	Hybrid	Nutrition Education		X													
726	Online	Nutrition & Wellness (GPIEDA SECTION NOT ALLOWED)					X						X				
727	Online	Physical Activity Epidemiology		X						X						X	
735	In person	Nutrition for Human Performance (GPIEDA SECTION NOT ALLOWED)				X			X			X			X		
743	Online	Obesity Across the Lifespan (GPIEDA SECTION NOT ALLOWED)				X						X					
754	In person	Assessment in Nutrition and Exercise Science	X						X						X		
760	Online	Skeletal Muscle Physiology					X						X				
761	In person	Physiological and Fitness Assessment in Exercise Science	X				X						X				
764	Hybrid	Advanced Cardiovascular Exercise Physiology								X						X	
777	In person	Scholarly Writing and Presenting in HNES					X						X				
790	In person	Graduate Seminar: Intro to HNES	X			X			X			X			X		

F= indicates fall semester. Sp= Spring semester. Su=indicates summer semester.

Masters of Athletic Training (MATrg)																
Course #	Course Title	F20	Sp21	Su21	F21	Sp22	Su22	F22	Sp23	Su23	F23	Sp24	Su24	F24	Sp25	Su25
720	Advanced Emergency Care	X			X			X			X			X		
770	Evidence Based Research/Practice (8 week course)	X			X			X			X			X		
772	Prevention and Health Promotion in Athletic Training (8 week course)	X			X				X			X			X	
773	Athletic Training Capstone (8 week course)		X			X			X			X			X	
774	Therapeutic Exercise	X			X			X			X			X		
775	Therapeutic Modalities		X			X			X			X			X	
776	Non-Orthopedic Assessment	X			X			X			X			X		
778	AT Admin and Prof Development (8 week course)		X			X			X			X			X	
780	Athletic Training Techniques			X			X			X			X			X
781	Orthopedic Assessment I	X			X			X			X			X		
782	Orthopedic Assessment II		X			X			X			X			X	

F= indicates fall semester, Sp= Spring semester. Su=indicates summer semester.

*PhD student can take courses in other if space allows and with instructor permission.

Appendix D. MS Exercise/Nutrition Science Course Objectives

HNES 642 – Community Health and Nutrition Education (3 credits)

Course Objectives

1. Students will develop skills for communicating with a diverse population.
 2. Students will communicate health and nutrition messages to the public.
 3. Students will apply motivational interviewing techniques to affect behavior change.
 4. Students will identify community resources targeted at improving health and nutrition status.
 5. Students will engage in advocacy to affect policy change.
-

HNES 642L Community Health and Nutrition Lab

Course Objectives

1. Demonstrate how to locate, interpret, evaluate and use professional literature to make ethical, evidence-based practice decisions.
 2. Select and use appropriate current information technologies to locate and apply evidence-based guidelines and protocols.
 3. Apply critical thinking skills.
 4. Demonstrate effective and professional oral and written communication and documentation.
 5. Develop an educational session or program/educational strategy for a target population.
-

HNES 668 Leadership and Communication in Dietetics

Course Objectives

1. Demonstrate effective and professional oral and written communication and documentation.
 2. Demonstrate cultural humility, awareness of personal biases and an understanding of cultural differences as they contribute to diversity, equity and inclusion.
 3. Describe contributing factors to health inequity in nutrition and dietetics including structural bias, social inequities, health disparities and discrimination.
 4. Identify and articulate one's skills, strengths, knowledge and experiences relevant to the position desired and career goals.
 5. Practice resolving differences or dealing with conflict.
 6. Promote team involvement and recognize the skills of each member.
 7. Demonstrate an understanding of the importance and expectations of a professional in mentoring and precepting others.
-

HNES 703- Graduate Biomechanics of Sports and Exercise (3 credits)

Course Objectives

1. To learn the biomechanical concepts related to training, sport, and physical activity.
 2. To further understand the application of biomechanical research to training, sport, and physical activity.
 3. To become familiar with some of the equipment used in the analysis of training, sport and physical activity.
 4. To practice and improve the student's ability to write professionally and adhere to APA or AMA format.
 5. To practice professional presentation skills
-

HNES 704- Psychological Foundations of Sport and Physical Activity (3 credits)

Course Objectives

1. To develop a comprehensive understanding of applied sport psychology.
 2. To learn how to apply the concepts to sports to improve performance in athletics.
 3. To learn how to apply the concepts to improve other areas of life outside of sports.
 4. To improve the student's literature search ability.
 5. To practice and improve the student's ability to write professionally and adhere to APA format.
-

HNES 710-Introduction to Research Design and Methods (3 credits)

Course Objectives

1. Develop a research topic of interest based on the available equipment and faculty expertise at NDSU.
 2. Understand the intricacies and importance of research ethics, methods, design and process.
 3. Conduct a literature review about a relevant research topic using the tools available at NDSU.
 4. Write high-quality sentences using specific skills for the area of expertise.
 5. Explain the differences between quantitative and qualitative research designs.
 6. Make corrections and edits to current writing based on the feedback of the instructor and peers.
 7. Understand the process of writing succinctly.
- Produce the start of a document serving as the basis for a Chapter 2 (e.g. Literature review) of a thesis/dissertation or other research project.
-

HNES 713 – Graduate Exercise Physiology (3 credits)

Course Objectives

1. Discuss the physiological bases of exercise stimuli.
 2. Interpret new research in field.
 3. Gain experience with advanced exercise physiology laboratory procedures.
-

HNES 724- Nutrition Education (3 credits)

Course Objectives

1. Apply theories (e.g. learning/educational theories, health behavior theory, health promotion theory, and communication theory) to decisions made in curriculum design, including teaching style and techniques.
 2. Identify social, environmental, and psychological factors influencing health behavior in terms of appropriate theories used to change eating behavior.
 3. Interpret current research.
 4. Interpret and incorporate new scientific knowledge into program design.
 5. Assess audience learning needs considering age, culture, needs/wants, readiness, resources, literacy level, and previous knowledge, using a variety of resources and data collection methods.
 6. Select content and teaching strategies to match nutrition or health education goals and audience needs. Recognize and differentiate between teaching techniques and their strengths and weaknesses for specific purposes.
 7. Write measurable goals and instructional objectives including cognitive, affective, and psychomotor (knowledge, attitude, and skill) domains.
-

HNES 726 – Nutrition and Wellness (3 credits)

Course Objectives

1. Utilize Maslow's Hierarchy of Needs to explore a person's or community's ability to develop a state of wellness.
2. Apply current research on nutrition to promote wellness across the lifespan.
3. Apply current research in nutrition and wellness to write a literature review on chosen topic.
4. Develop relevant social media content to promote nutrition for wellness to a community.

HNES 727- Physical Activity Epidemiology (3 credits)

Course Objectives

1. Topics and concepts related to physical activity epidemiology.
 2. Critical thinking linked to physical activity epidemiology.
 3. Principles of interventions and secondary data analyses.
 4. Construction of an intervention that increases an aspect of physical activity participation for disease or disability mitigation.
-

HNES 735-Nutrition for Human Performance (3 credits)

Course Objectives

1. Students will be able to describe basic nutrition science concepts such as the six classes of nutrients.
 2. Students will recognize that choosing a variety of foods contributes to optimum health and will gain skills in utilization of the latest USDA dietary guidelines, including iron and calcium recommendations and avoidance of fad diets and fad supplements.
 3. Students will demonstrate their knowledge of nutritional habits and use of ergogenic aides that contribute to optimization of endurance and performance among active individuals.
 4. Students will gain knowledge and skills to select a diet that supports health and reduces the risk of chronic disease such as obesity (or overweight) and skills that support reduction for disordered eating/eating disorders (DEED).
 5. Students will learn the signs and symptoms of physical activity and nutrition related chronic and acute conditions and will gain skills related to health promotion and prevention such as body composition testing and knowing consequences of excess or too little body fat.
 6. Students will supervise use of established position papers and peer reviewed research publications in the field of sports nutrition.
 7. SN 2.2 (for Dietetics accreditation): Evaluate emerging research for application in promoting active lifestyles across the lifespan.
-

HNES 743- Obesity Across the Lifespan (3 credits)

Course Objectives

1. Topics and concepts related to obesity and health.
2. Trends in obesity, and obesity in society.
3. Critical thinking linked to obesity and health.
4. Risk factors associated with obesity and strategies for mitigating such risk factors.
5. The central- and population-level influences of obesity across the lifespan.

HNES 754 – Assessment in Nutrition and Exercise Science (3 credits)

Course Objectives

1. Examining and discussing research related to nutrition and exercise science assessments.
 2. Understanding the reliability, validity, feasibility, and appropriateness of assessment modes.
 3. Using assessment hardware and software for research and practical purposes.
 4. Applying assessment modes and interpreting their data.
-

HNES 760–Skeletal Muscle Physiology (3 credits)

Course Objectives

1. Identify skeletal muscle microanatomy and associate structures with muscle function;
 2. Explain the process and regulation of skeletal muscle contraction;
 3. Explain how muscle adapts to altered patterns of use including exercise, disuse, and aging;
 4. Identify and explain factors thought to contribute to the onset of fatigue during exercise;
 5. Critically analyze current literature pertaining to skeletal muscle physiology.
-

HNES 761- Physiological and Fitness Assessment in Exercise Science (3 credits)

Course Objectives

1. To explore why exercise testing is applicable in the health/fitness setting.
 2. To provide the student with advanced techniques and tools relative to exercise assessments.
 3. To provide the student with information to prepare well-developed exercise prescriptions for the general public.
 4. Advanced skills in essential resting and exercising clinical measurements.
 5. Advanced skills in monitoring physiological responses to dynamic exercise
-

HNES 762- Exercise Endocrinology (3 credits)

Course Objectives

1. Discuss the various hormones and organs within the endocrine system.
2. Understand the hormonal response to exercise and related stimuli.
3. Interpret new research in field of exercise endocrinology.

HNES 764 Advanced Cardiovascular Exercise Physiology (3 Credits)

Course Objectives:

By the end of the course, students will be able to:

1. Know in-depth knowledge of each component of the cardiovascular system – the heart, the vasculature, and the blood.
 2. Know the clinical relationship between electrical activity in the heart and the waveforms visible on the electrocardiogram (ECG).
 3. Possess skills in assessing hemodynamics, cardiac output, and ECGs in a laboratory setting.
 4. Ability to know and assess the effects of acute and chronic exercise on the components of the cardiovascular system
-

HNES 777- Scholarly Writing and Presenting in HNES (3 credits)

Course Objectives

1. Understanding the peer-review process.
 2. Critical thinking skills.
 3. Revising research materials with respect to critical feedback.
 4. Disseminating research in writing.
 5. Disseminating research in presentations.
-

HNES 770 - Athletic Training Evidence Based Research & Practice (2 credits)

Course Objectives

1. Understand and define evidence-based practice as it related to athletic training clinical practice.
2. Apply evidence-based practice in the clinical decision-making process and advancing clinical practice. (Standard 62)
3. Determine the effectiveness and efficacy of an athletic training intervention using evidence-based practice concepts. (Standard 62)
4. Apply methods of assessing patient status and progress (global rating of change, minimal clinically important difference, minimal detectable difference) using psychometric clinical outcomes assessments.
5. Describe a systematic approach to create and answer a clinical question through review and application of existing research.
6. Develop a relevant clinical question using a pre-defined question format (PICOT/PIO).
7. Describe and contrast research and literature resources including databases and online critical appraisal libraries that can be used for conducting clinically-relevant searches.
8. Conduct a literature search using a clinical question relevant to athletic training practice using search techniques (Boolean search, Medical Subject Headings) and resources appropriate for a specific clinical question.

9. Use standard criteria or developed scales (PEDro, CEBM/SORT) to critically appraise the structure, rigor, and overall quality of research studies.
10. Describe and differentiate the types of quantitative and qualitative research designs, research components, and levels of research evidence (hierarchies).
11. Understand basic level statistics.
12. Understand validity (internal and external) and reliability.
13. Understand the concepts of diagnostic accuracy.
14. Explain the theoretical foundation of clinical outcomes assessment (eg: disablement, HRQOL) and describe common methods of outcomes assessment in athletic training clinical practice (generic, disease-specific, region-specific, and dimension-specific outcomes instruments).
15. Analyze a research study/studies to determine if the reported results are valid, reliable, and applicable to clinical practice (Critically appraised paper – CAP and Critically appraised topic - CAT).
16. Execute scientific, professional writing to submit for publication.
17. Present a research question of interest to an audience.

Appendix A- Document Revision Log

Date	Revision	HNES Representative
9/2022	Update HNES Graduate Faculty as PhD advisors. Course Rotation List updated. Imbedded Links were checked for accuracy. Elective Courses updated.	Kyle Hackney
9/2023	Update HNES Graduate Faculty as PhD advisors Course Rotation List updated. Imbedded Links were checked for accuracy. Update language based on merger.	Kyle Hackney