COURSE OUTLINE
HPA 2990 – Research Seminar in Health and Physical Activity
and
MS Degree Comprehensive Examination

NOTE:

- ***The information below related to the Comprehensive Examination applies to all students who are anticipating graduating at the conclusion of the Summer 2019 term.***
- ***The information related to the "Scientific Research Abstract" applies only to students in the Research Track who are completing this course during the Summer 2019 term.***

1. Course Instructors

The organization of this course is provided by Dr. Jakicic (jjakicic@pitt.edu ; 412-383-4001) who is responsible for evaluating the final writing and presentation assignment. Dr. Jakicic will also solicit the assistance of other faculty during this evaluation process. However, each student may need to consult with the faculty member who provided them with data from their Directed Study experience during this course.

2. Course Prerequisite (Research Track Students)

a. This course is to be completed during the final term of the MS Degree program. Thus, the student may have registered with this course in a prior term, but the final requirements can only be completed during the final term of the MS Degree Program. These requirements included: 1) writing assignment [expanded scientific abstract], 2) scientific presentation, 3) comprehensive examination.
b. The writing assignment and presentation are to be based on the Directed Study (HPA 2998) and Statistics in HPA Research (HPA 2410) for students in the Research Track, which were to have been completed in prior terms.
c. The comprehensive examination that is a component of this course can only be taken in the final term of the MS Degree Program and following completion of HPA 2371, HPA 2374, and HPA 2268.

3. Purpose of Course

a. Provide guidance on the requirements for completion of a non-thesis MS degree research writing experience.
b. Provide guidance on the requirements for completion of a non-thesis MS degree presentation to the faculty in the Department of Health and Physical Activity.
c. Provide guidance on the requirements for completion of the comprehensive examination in the MS degree program.

4. Class Schedule and Deadlines

(Note: Dates and time subject to change. The students will be notified of changes in dates and times.)

SUMMER 2019 TERM (May 14, 2019 – August 4, 2019)

DATE	TYPE OF COURSE MEETING	TOPIC/DEADLINE
May 17, 2019	No class scheduled	Example of "expanded scientific abstract" and guidelines (Introduction, Purpose, Design, Subjects, Methods, Results, Conclusions) are provided to the students.
May 24, 2019	No class scheduled	Students work independently on a draft of the expanded scientific abstract.
May 31, 2019	No class scheduled	1st Draft of writing assignment (expanded scientific abstract) is to be emailed to Dr. Jakicic at jjakicic@pitt.edu. The subject line of this email should be "HPA 2990 SCIENTIFIC ABSTRACT".
June 7, 2019	In-Class Meeting	Dr. Jakicic will review scientific the abstracts. Feedback will be provided to the students, who will revise the abstract based on this feedback.
June 14, 2019	In-Class Meeting (12:00-2:00 PM) NOTE: Make-up examinations will not be given. Students must attend at this time.	Comprehensive Examination NOTE: Students not receiving at least an 80% grade on this comprehensive examination will be required to retake the examination on Friday June 28, 2019 from 12:00-2:00 PM.
June 21, 2019	In-Class Meeting	2nd Draft of writing assignment (expanded scientific abstract) is to be emailed to Dr. Jakicic at jjakicic@pitt.edu. The subject line of this email should be "HPA 2990 SCIENTIFIC ABSTRACT".
June 28, 2019	Class Scheduled only for those students not receiving at least an 80% of the previously administer comprehensive examination. NOTE: Make-up examinations will not be given. Students must attend at this time.	Comprehensive Examination for those students who did not earn at least an 80% of the examination administered on June 15th.
July 5, 2019	No class scheduled	3rd draft of abstract and 1st draft of slide presentation are due. This is to be emailed to Dr. Jakicic at jjakicic@pitt.edu. The subject line of this email should be "HPA 2990 SCIENTIFIC ABSTRACT".
July 12, 2019	Individual student meetings with instructor as needed.	Feedback provide to students on abstract and slide presentation.
July 19, 2019	Individual student meetings with instructor as needed.	Abstract and presentation finalized.
July 26, 2019	Class Scheduled (12:00-2:00 PM)	Scientific Presentation to the HPA Faculty.
August 2, 2019		Grades posted

5. Completion of Course Requirements

Required Writing Assignment

A. Students enrolled in the Research Track are to complete this requirement using the following.
    a. This requirement includes development of an Expanded Scientific Abstract (please see the guidelines below and the "abstract template" that is provided.
        i. This scientific manuscript should include the following components:
            1. Title: Include a descriptive title that is not to exceed 100 characters that includes text and spaces.
            2. AUTHOR: Include the author name.
            3. Body of the Abstract: The following section titles are to be used and the total length across these sections should not exceed 4,000 characters that includes text and spaces. Each table and figure counts 500 characters against this character limit.
                a. INTRODUCTION: Provide a brief introduction that justifies the purpose of the study.
                b. PURPOSE: Provide the purpose of the study.
                c. DESIGN: Provide a brief description of the study design (e.g., cross-sectional, prospective cohort, randomized, etc.).
                d. SUBJECTS: Provide a brief description of the subjects that includes sample size and pertinent descriptive characteristics.
                e. METHODS: Provide a description of any assessments and interventions that were used in this study.
                f. RESULTS: Provide a summary of key results. This should include pertinent data and results from statistical analyses.
                g. CONCLUSIONS: Provide a summary of conclusions that can be made based on the results presented. The conclusions should not simply restate the results, but rather provide an interpretation and/or application of the results of the study.
            4. Also include a list of pertinent references. This list of references does not count against the 4,000 character limit. However, the student should use the referencing system of *Medicine and Science in Sports and Exercise*

when developing the reference list and when citing these references within the body of the abstract.

ii. Evaluation of this scientific abstract will be based on the following areas:
    1. The student following the guidelines provided above that include the specific sections of the abstract to include.
    2. Quality of the content included in the abstract.
    3. The flow of the abstract, which includes providing a balanced viewpoint, coherent theme, flow of ideas from general to specific, and transitions between sections.
    4. Appropriate content covered in depth without being redundant.
    5. Sources are cited to support specific statements as necessary.
    6. Shows insight into problem; conclusions strongly supported with appropriate analysis and presentation of data.
    7. Succinct and precise conclusions based on the data and review or corresponding literature.
    8. Clarity of writing and writing technique.

B. Students enrolled in the Clinical/Practitioner Track who started the program prior to May 2014 are to contact Dr. Jakicic for guidelines on their manuscript and presentation.
    a. Students enrolled in the Clinical/Practitioner Track who started the program after May 2014 and have not yet registered for HPA 2990 but are scheduled to graduate at the end of the Summer 2019 term are to register for a different section of this course. Please contact Dr. Jakicic for details.

Required Presentation

The student is required to develop a presentation based on the expanded abstract requirement described above. This is presented to the faculty on the date listed above in the course syllabus. The following guidelines are to be used when developing this presentation:

A. PowerPoint is to be used for the development of this presentation. Please save this in a format compatible with PC-based MS PowerPoint.
B. The presentation is not to exceed 10 minutes. This will be followed by a 5 minute period for questions/answers. NOTE: This time will be strictly enforced. Points are deducted if the student exceeds the allocated time for the presentation.
C. The student is to be polished, organized, and dressed professionally. This presentation is evaluated by the faculty. This is a professional lecture and NOT an informal presentation, so please be prepared.

D. The abstract developed for the required paper should be distributed to all attendees.
E. A printed copy of the slides (no less than 6 per handout page) is to be made available to the faculty in attendance.

Comprehensive Examination

The following information is for students who plan on graduating in August 2019 (end of the Summer 2019 term).

Students who started the MS Degree Program between May 2009 and the present date are required to take and pass a written comprehensive examination prior to graduation (*NOTE: Students enrolled and taking their first class prior to May 2009 are exempt from taking this comprehensive examination*). This examination is to be taken during your last semester of study prior to graduation. Thus, if you plan on graduating in August 2019 you are required to take this examination as outlined below.

If you will be taking this examination, please contact Donna Farrell (dfarrell@pitt.edu) by June 1st to have your name added to the list of students taking this examination during the Summer 2019 term.

This examination is given on the following dates and times.

1. The comprehensive examination will be given on Friday June 14, 2019 from 12:00-2:00 PM in the Oak Hill Research Facility. The student is required to earn an 80% on this examination to pass and to be eligible for graduation.
    a. **Please note that the comprehensive examination is only administered on this date and time. Please make arrangements with your employer or with your internship supervisor so that you are able to attend on this date and at this time.**
2. If the student does not earn an 80% of the comprehensive examination, the student is permitted to retake the examination on Friday June 28, 2019 from 12-2 PM in the Oak Hill Research Facility.
    a. **Please note that the comprehensive examination is only administered on this date and time. Please make arrangements with your employer or with your internship supervisor so that you are able to attend on this date and at this time.**
3. On the day of your examination please report to in the Oak Hill Research Facility. The room designated for this examination will be provided to you at that time.
4. Please bring a calculator with you that can be used during the examination.
    NOTE: You will not be permitted to use the calculator on your cellular phone or on your computer.
5. The comprehensive examination will consist of approximately 50 multiple choice questions based on courses you were required to take as part of your academic plan of study. The questions will be based on content included in HPA 2371 (Advanced Exercise Physiology) and HPA 2374 (Exercise Testing, Prescription, and Supervision), and HPA 2268 (Physical Activity and Health).

6. A study guide is attached to this course syllabus to assist you in preparing for this examination.

   NOTE: This study guide is designed to provide the student with general information on the content areas that may be included on the comprehensive examination. However, the student is encouraged to refer to class notes and textbooks from HPA 2371, 2374, and 2268 when preparing for the comprehensive examination.

7. Successful completion of this examination is a requirement for graduation, which requires a score of ≥80%. Students are only permitted 2 attempts at successful completion of the comprehensive examination during a term. Students who do not successfully pass this comprehensive examination will not be approved for graduation, so please take the time to prepare appropriate for this examination.

6. Grading Policy

A. The student must earn a satisfactory grade on the manuscript/paper, presentation, and comprehensive examination to receive a Satisfactory (S grade) for this course. A Satisfactory grade in this course is required for graduation.

COURSE REQUIREMENT	CRITERIA TO RECEIVE A SATISFACTORY GRADE
Expanded Abstract	≥80%
Presentation	≥80%
Comprehensive examination	≥80%

B. Incomplete or G Grades

Students must complete all course requirements to receive a grade for this course. In the event of extenuating personal circumstances, such as a medical emergency or a death in the family, an I or G grade may be awarded to signify unfinished course work. *G or I grades will not be an option for students who fall behind in the course for non-emergency reasons.* Students assigned I or G grades are required to complete course requirements no later than one year after the term in which the course was taken. After the deadline has passed, the I or G grade will remain on the record, and the student will be required to reregister for the course if it is needed to fulfill requirements for graduation.

8. **Academic Integrity**

Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

9. **Disability Services**

If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructor and Disability Resources and Services no later than the second week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call (412) 648-7890 (Voice or TTD) to schedule an appointment. The Disability Resources and Services office is located in the William Pitt Union on the Oakland campus.

10. **Statement on Classroom Recording**

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

11. **Departmental of Health and Physical Activity Grievance Procedure.**

If a student feels that they have been treated unfairly by the instructor with regard to their grade or other aspects of their course participation there are a series of steps that should be taken in an attempt to resolve this matter. These include the following:

1. The student should first inform the instructor of the course of the issue in an attempt to resolve this matter. If the course is taught by a Teaching Assistant, Graduate Student, or Part-Time instructor, their faculty supervisor should also be informed of this matter. The student should bring this issue to the attention of the instructor in a timely matter and should maintain a record of interactions that occurred with the instructor regarding the matter in question. The course instructor should take necessary steps to address the concern raised by the student in a timely matter and should maintain a record of the interactions that occurred with the student regarding this matter.
2. If, after reasonable attempts to resolve the matter, the matter is not resolved in a manner that is deemed to be acceptable to the student, the student retains the right to file a grievance. This grievance is to be filed with the Department Chair in the form of a written document that can be submitted via email or campus mail. This document should include the following:
    a. Student's name
    b. Student contact information (email, address, telephone number)
    c. Information on the course for which the grievance applies (course title, course number, instructor name).
    d. A copy of the course syllabus that was provided to the student by the instructor
    e. Detailed description of the grievance and additional information the student feels is pertinent to this matter.

After receiving this information the Department Chair will inform the student if additional information is needed, as appropriate will discuss this matter with the student and the instructor, and will issue a decision in a timely manner.

3. If the student is not willing to accept the decision of the Department Chair, the student will be informed that they can request an additional review of this matter through the Office of the Dean of the School of Education. If the student decides to pursue this, the student should contact the Associate Dean for Student Affairs & Certification in the School of Education at the University of Pittsburgh.

GRADUATION

This course is to be completed in the final term of your MS Degree program. If you plan on graduating at the end of the Summer 2019 term, please pay close attention to the following:

A. You must apply for graduation. Contact the School of Education or check the School of Education website (www.education.pitt.edu) for the deadline requirements. All graduation applications are handled by Admission and Enrollment Services located on the 5th floor of Posvar Hall. Check that your diploma information is correct.
B. Check that a signed Plan of Study is on file. This Plan of Study needs to be signed by the Student, Advisor, and Department Chair.
C. All I and G grades need to be rectified. If you have an "I" or "G" grade contact the course instructor to rectify this grade prior to graduation.
D. You need to be registered as a student in the term you are graduating. Students needing a waiver of this requirement need to contact Associate Dean Michael Gunzenhauser on the 5th Floor of Posvar Hall.

DEPARTMENT OF HEALTH AND PHYSICAL ACTIVITY

MASTER OF SCIENCE DEGREE
COMPREHENSIVE EXAMINATION STUDY GUIDE

Comprehensive Examination Study Guide for HPA 2371: Advanced Exercise Physiology Core Content

1. **Biological Energy Transformation**
    - **a.** Aerobic and Anaerobic ATP Production
    - **b.** Rate limiting enzymes

2. **Metabolic Responses to Exercise**
    - **a.** Steady State
    - **b.** Lactate Removal
    - **c.** Factors Governing Fuel selection

3. **Cardiovascular & Responses to Exercise**
    - **a.** Cardiac Cycle
    - **b.** Cardiovascular Control
    - **c.** Cardiovascular adaptations to training
    - **d.** Electrical Activity of the Heart
    - **e.** Redistribution of Blood Flow During Exercise

4. **Respiration During Exercise**
    - **a.** Respiratory Control
    - **b.** Pulmonary volumes and capacity
    - **c.** Oxygen and Carbon Dioxide transport in Blood
    - **d.** Ventilatory Threshold

5. **Skeletal Muscle**
    - **a.** Muscle Proprioceptors
    - **b.** Fiber type and distribution
    - **c.** Delayed Onset Muscle Soreness

6. **Training and Physiological Adaptations**
    - **a.** Interval training
    - **b.** Criteria to attain VO_2max

7. **Measurement of Energy Expenditure.**
    - **a.** Indirect Calorimetry
    - **b.** Exercise efficiency
    - **c.** Running Economy
    - **d.** Respiratory Exchange Ratio
    - **e.** Metabolic Equivalent

8. **Exercise and the Environment**
    - **a.** Acute and chronic responses to altitude

9. **Body Composition**
    - **a.** Body density and Two component Model

Potential Resources

Exercise Physiology (4th Edition) by Brooks, Fahey and Balwin (McGRaw Hill Publishing)
Exercise Physiology (7th Edition) by Powers, Howley (McGraw Hill Publishing*)*

Comprehensive Examination Study Guide for HPA 2374: Exercise Testing, Prescription, and Supervision

1. Electrocardiography
   a. Basic electrophysiology
   b. Conduction system
   c. Lead systems
   d. Rate
   e. Rhythm
   f. Hypertrophy
   g. Infarction
   h. Ischemia

2. Pharmacology
   a. Beta-blockers
   b. Nitrates
   c. Calcium channel blockers

3. Exercise Prescription
   a. Heart rate reserve
   b. VO_2 reserve

4. Exercise Testing
   a. Maximal testing
   b. Submaximal testing

5. Clinical Exercise Physiology
   a. Metabolic and cardiovascular responses to aerobic exercise
   b. Detraining

6. Heart Disease
   a. Risk factors

Study Guide References

1. American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription. Philadelphia, PA: Lippincott, Williams, and Wilkins.
2. Dubin, D. Rapid Interpretation of EKG's. Fort Myers, Florida: Cover Publishing Co.

HPA 2268: Physical Activity and Health Comprehensive Exam Review

*Focus on course powerpoint presentations and supplemental readings related to the following areas:

1. Know the history of the associations between **physical activity and health**.
2. Define common terms and definitions related to physical activity and health.
3. Know the current status of physical activity in our country.
4. Understand what determines activity levels.
5. Health goals for the country over the next decade or two.
6. Know the criteria used to determine if a **physical activity measure** is appropriate to use.
7. Know and understand the current objective measures of physical activity.
8. Know and understand the current subjective measures of physical activity.
9. Various measurement issues in physical activity measurement and assessment.
10. Know what **physical activity epidemiology** is, and the types of studies involved.
11. Understand strengths and weaknesses of different study designs and how to evaluate results.
12. Understand the terminology and measures used in this type of research in order to understand and explain evidence.
13. Understand the criteria used to determine causation between two factors.
14. Current prevalence of **CHD and stroke** in this country.
15. Understand the basic pathophysiology of cardiovascular disease and potential mechanisms by which physical activity may affect the development or progression of these diseases.
16. Understand the current evidence of the role of physical activity in the prevention of CVD.
17. Understand the current evidence of the role of physical activity in the treatment of CVD.
18. Be able to determine the strength of the most current evidence linking physical activity and cardiovascular disease.
19. Current prevalence of **cardiovascular disease risk factors.**
20. Understand the basic pathophysiology of these risk factors and potential mechanisms by which physical activity may affect their development.
21. Understand the current evidence of the role of physical activity in the prevention of these risk factors.
22. Understand the current evidence of the role of physical activity in the treatment of these risk factors.
23. To be able to determine the strength of the most current evidence linking physical activity and hypertension, hyperlipidemia, and obesity.
24. Current prevalence of various types of **cancer** in this country.
25. Understand the basic pathophysiology of cancer and immune system dysfunction and potential mechanisms by which physical activity may affect the development or progression of these diseases.
26. Understand the current evidence of the role of physical activity in the prevention of cancer.
27. Understand the current evidence of the role of physical activity in the treatment of cancer.
28. Determine the strength of the most current evidence linking physical activity and cancer and immune system dysfunction.
29. Current prevalence of **diabetes**.
30. Understand the basic pathophysiology diabetes and the potential mechanisms by which physical activity may affect the development of diabetes.
31. Understand the current evidence of the role of physical activity in the prevention of diabetes.
32. Understand the current evidence of the role of physical activity in the treatment of diabetes
33. Be able to determine the strength of the most current evidence linking physical activity and diabetes.

34. Current prevalence of **osteoporosis** and other bone issues.
35. Understand the basic pathophysiology of osteoporosis and osteopenia and the potential mechanisms by which physical activity may affect the development of these conditions.
36. Understand the current evidence of the role of physical activity in the prevention of osteoporosis.
37. Understand the current evidence of the role of physical activity in the treatment of osteoporosis.
38. Be able to determine the strength of the most current evidence linking physical activity and bone health.
39. Current prevalence of **depression and anxiety**.
40. Understand the basic pathophysiology of these mental health issues and the potential mechanisms by which physical activity may affect the development of these conditions.
41. Understand the current evidence of the role of physical activity in the prevention of depression or anxiety.
42. Understand the current evidence of the role of physical activity in the treatment of depression and anxiety.
43. Be able to determine the strength of the most current evidence linking physical activity and mental health issues.

Additional Areas of Study for the Comprehensive Examination

- What is the role of nitrates in individuals with advanced coronary artery disease?
- What cardiovascular variables are responsible for variations in VO_2 max?
- What factors influence the rate and strength of contraction of the heart?
- What are the physiological factors that result in fatigue during various modes and intensities of exercise?
- What circulatory responses occur to meet the increased oxygen demands of muscle during exercise?
- What are the anatomical and/or physiological implications of abnormalities observed on an ECG during rest or exercise?
- Under which conditions are various types of exercise tests most appropriate?
- What enzymatic activity influences glycolysis?
- What are the risk factors for coronary artery disease?
- What is the conventional placement of electrodes for a 12-lead ECG?
- What factors are responsible for oxygen or carbon dioxide transport?
- What is the importance/role of carbohydrate and or fat in substrate metabolism?
- The components of an ECG correspond to which components of the heart contraction?
- Identify the condition associated with abnormalities observed on an ECG.
- What factors enhance recovery from a bout of exercise?
- What is a metabolic equivalent?
- What is the number of ATP formed through the various components of substrate metabolism?
- When would you expect to observe a wider than normal QRS complex?
- Which medications are effective in preventing angina caused by spasms of the coronary arteries?
- What factors contribute to an increase in cardiac output during exercise?
- What is the role of carotid bodies (chemoreceptors)?
- Under what electrophysiological conditions would an ECG complex be either positive or negative?
- What anatomical areas of the respiratory system represent the largest to smallest in lung capacity?
- What are the factors that influence exercise performance at altitude?
- What is the ventilator threshold and what factors influence this?
- What methods of training are most associated with improvements with each of the components of energy metabolism?
- What is the influence of physical activity and/or fitness on various mechanisms that are associated with the onset of chronic diseases?
- What is the influence of physical activity on depression and mechanisms that may influence depression?
- Why does it appear that depression is associated with cardiovascular disease?
- What are the factors that influence bone health and how does physical activity play a role in optimal bone health?
- How does physical activity/exercise/fitness influence risk factors for the various chronic diseases (CVD, diabetes, cancer, etc.)?
- What is the age-predicted maximal heart rate and how is it computed?
- What is the heart rate range and heart rate reserve, and how are these computed?
- What are oxygen uptake and the oxygen uptake reserve, and how are each of these measured and computed?
- What is the response of cortisol, plasma growth hormone, or other hormones during periods of exercise?
- What is the risk of sitting (sedentary behavior) morbidity and mortality of various chronic diseases, and what are the mechanisms by which sedentary behavior may influence the onset of chronic diseases?
- What are the physiological mechanisms that may be linked to the onset of various chronic conditions?