

Clinical Education Experience Requirements

Each athletic training student is required to complete six, semester-long clinical education experiences under the supervision of a clinical instructor. Clinical education experiences provide the student with the opportunity for experiential learning to apply the entry level athletic training clinical proficiencies in a clinical environment. Clinical education experiences are completed at both on-campus and off-campus clinical sites. During the course of the program, students will have exposure to a variety of clinical instructors, clinical settings, patient populations and health care professions. The University of Michigan's Department of Intercollegiate Athletics provides numerous on-campus clinical sites. The University of Michigan has two main and seven satellite athletic training facilities for intercollegiate athletics. All facilities are fully equipped with state-of-the-art equipment. In addition, students complete clinical experiences at our off-campus affiliated sites. Affiliated sites include local high schools, sports medicine clinics, and occupational/industrial clinics.

Movement Science Major

MOVEMENT SCIENCE CURRICULUM MISSION STATEMENT

The Movement Science (MOVESCI) major strives to fully develop the intellectual abilities of each student during their learning experiences in the School of Kinesiology. The program emphasizes the study of human movement from biological and behavioral perspectives across the lifespan. The Movement Science Department achieves their mission by offering a diversified program that includes introductory and advanced course work, research, and laboratory experiences. Success is evaluated by the academic and professional placement of graduates.

Program Overview

The Movement Science major comprises coursework that emphasizes the causes and consequences of human movement from biomechanical, motor control and development, and physiological perspectives. The requirements include courses both in and outside of Kinesiology.

The Movement Science curriculum emphasizes competencies in five areas:

1. Three areas of Movement Science; Biomechanics, Motor Control, and Exercise Physiology
2. Research
3. Scientific communication, including oral, written and graphic skills
4. Computer literacy

Students will gain these competencies by mastering concepts in courses, by exposure to research in laboratory sections of courses and in independent study and research courses.

Content emphases of major areas in Movement Science. The Movement Science major emphasizes content in three major areas: biomechanics, exercise physiology, and motor control and development. Key concepts in each area are given below.

1. BIOMECHANICS

- Ability to describe movement from kinematics and kinetics perspectives.
- Apply biomechanical concepts and principles to analysis of motor skills among diverse and special populations.
- Understand underlying physical mechanisms involved in the control and coordination of movements.
- Understand basic mechanical properties of muscle, tendon, ligament, and bone.
- Relate the mechanical loads placed on the human body to the mechanical properties of tissues.
- Identify basic biomechanical mechanisms used by humans to reduce metabolic cost and fatigue during movement.

2. EXERCISE PHYSIOLOGY

- Understand regulation of different biological functions including cardiovascular, neural, renal, pulmonary, musculoskeletal, and endocrine systems during rest and movement.
- Understand mechanisms causing biological adaptations to chronic exercise at the molecular, cellular, systemic and whole-body level.
- Understand relationships between physical activity, energy, nutrition, chronic disease, and health.
- Understand neural, cardiorespiratory, nutritional, bioenergetic, metabolic and endocrine bases of human performance.
- Understand and appreciate racial, ethnic, age-associated and gender differences in exercise performance and in biological adaptations to movement.
- Assess flexibility, strength, and endurance factors that influence movement and physical performance.

3. MOTOR CONTROL AND DEVELOPMENT

- Ability to describe movement from a kinematic and associated muscle activation pattern perspective.
- Apply motor development and motor control concepts and principles to analysis of motor skills among diverse and special populations.
- Identify and differentiate among the diverse theories of motor skill acquisition.
- Identify factors affecting motor behavior, including physical growth, physiological, perceptual and cognitive changes, and sociocultural practices.
- Understand interaction between perception and action throughout the lifespan.
- Understand basic principles underlying neural and neuromuscular communication.

- Understand the relationship between central nervous system structure and function as it applies to human motor control.
- Understand the normal course of physical growth and maturation throughout the lifespan.

Movement Science Course of Study

The Movement Science curriculum requires courses in of the following six categories:

1. Non-Kinesiology prerequisite courses (42 credit hours). These may be distribution courses.
2. Core prerequisite courses in Kinesiology (11 credit hours)
3. Required university distribution courses (36 credit hours)
4. Required core courses in Movement Science (19 credit hours)
5. Elective courses: MOVESCI upper level electives (9 credit hours) and Cognate electives (11 credit hours)

Some required courses count in more than one category (See distribution table below). For example, human physiology (PHYSIOL 201) is a required non-Kinesiology prerequisite course, but it also count towards a distribution course in the Natural Science area.

1. Core Non-Kinesiology Prerequisite Courses [42 credit hours]

These courses are typically completed prior to taking the 300-level required core courses in Movement Science. Some of the courses are required as prerequisites for the core courses in Movement Science and must be completed prior to enrolling in specific core courses.

- BIOLOGY 171 (4 credits) - Ecology and Evolution (NS)
- BIOLOGY 172 (4 credits) – Cellular, Molecular, and Developmental (NS)
- BIOLOGY 173 (2 credits) – Introductory Biology Laboratory (NS) – Completion of BIO 171 or 172 and concurrent enrollment in the other, or completion of both BIO 171 and 172, or BIO 195
- CHEM 130 (3 credits) - General Chemistry: Macroscopic Inv & Reaction Principles (NS)
- ENGLISH 125 (4 credits) - College Writing
- ENGLISH 225 (4 credits) - Argumentative Writing (HU)
- Math 115 (4 credits) - Calculus I (NS)
- MEDADM 403 (5 credits) - Human Anatomy: Structure and Function (NS)
- PHYSICS 135 (4 credits) – Physics for the Life Sciences I (NS)
Or PHYSICS 140 (4 credits) – General Physics I (NS)
- PHYSIOL 201 (4 credits) - Introduction to Human Physiology (NS)
- PSYCH 111 (4 credits) - Introduction to Psychology (SS)

Any anatomy, biology, chemistry, English, math, physics, physiology, or psychology course that is equivalent to the above course offered at the University of Michigan will be considered. However, students wishing to apply to graduate or professional schools need to give consideration to the level of the course and where it was completed (community college, medical school, laboratory-based courses, etc.). Many graduate and professional programs require higher level mathematics, chemistry, and physics courses (see the list of Movement Science [cognate electives courses](#) on the School of Kinesiology website).

2. Core Prerequisite Courses in Kinesiology [11 credit hours]

The courses listed below should be completed before taking the required core courses in Movement Science; note that MOVESCI 110 is a prerequisite for many Movement Science courses.

- MOVESCI 110 (3 credits) - Biological and Behavioral Bases of Human Movement
- SM 101 (3 credits) – Public and Small Group Communication
- PHYSED 216 (2 credits) - First Aid and Safety Education
- MOVESCI 313 (3 credits) – Scientific Writing

3. Required University Distribution Courses [36 credit hours]

Courses in the Core Prerequisite Courses outside Kinesiology category satisfy all of the required Natural Science distribution credits and some of the required Humanities and Social Science distribution credits. Additional Social Science and Humanities courses must be taken to fulfill the Humanities and Social Science distribution requirements.

HUMANITIES (HU) (12 CR)	NATURAL SCIENCES (12 CR)	SOCIAL SCIENCES (SS) (12 CR)
ENGLISH 225 (4 credits)	BIOLOGY 171 (4 credits)	PSYCH 111 (4 credits)
SM 101 (3 credits)	BIOLOGY 172 (4 credits)	<i>additional 8 credits needed</i>
MOVESCI 313: SciWrt (3 credits)	BIOLOGY 173 (2 credits)	
<i>additional 2 credits needed</i>	CHEM 130 (3 credits)	
	MATH 105/MATH 115 (4 credits)	
	MEDADM 403 (5 credits)	
	PHYSICS 135 or 140 (4 credits)	
	PHYSIOL 201 (4 credits)	
	PSYCH 112 (4 credits)	

4. Required Core Courses in Movement Science [19 credit hours]

Five courses form the core set of courses that are required of all Movement Science students. These courses serve as prerequisite courses for many of the Movement Science elective courses.

1. MOVESCI 230 (4 credits). Human Musculoskeletal Anatomy. Examines the functional relationship between human musculoskeletal anatomy and body movement. Students will learn the bone names and landmarks, joint structures and movements, and the names, attachments and functions of the major muscles. Includes laboratory experience. *Prerequisites: None.*
2. MOVESCI 250 (3 credits). Statistics and Research Methods in Movement Science. Covers the fundamentals of research design and the applications of statistics to reading, planning, implementing, and analyzing research in Movement Science. Laboratory experiences are integrated with the course content. *Prerequisites: None.*
3. MOVESCI 320 (4 credits). Motor Control. Introduces students to the neural and behavioral basis of motor control. Topics include nervous system structures involved in planning, executing and learning movements, as well as the principles of motor control that apply to locomotion, reaching and grasping, multi-joint coordination and more complex skills. Motor control principles underlying rehabilitation are also introduced. Includes laboratory experience. *Prerequisites: MOVESCI 110, MEDADM 401 or MOVESCI 230, MOVESCI 250, PHYSIOL 201.*
4. MOVESCI 330 (4 credits). Biomechanics of Human Movement. Applies fundamental biomechanical principles to the human musculoskeletal system. Topics include musculoskeletal mechanics, tissue biomechanics, and quantitative analysis of human movement. Includes laboratory experience. *Prerequisites: MOVESCI 110, MATH 105 or 115, PHYSICS 125, 135, or 140, MEDADM 401 or MOVESCI 230.*
5. MOVESCI 340 (4 credits). Exercise Physiology. Physiological principles of human movement. Topics include bioenergetics, energy expenditure, functions of the cardiovascular, pulmonary, neuromuscular and neuroendocrine systems, training, environmental influences, ergogenic aids, weight control, and body composition. Includes laboratory experience. *Prerequisites: MOVESCI 110, MEDADM 401 or MOVESCI 230, MOVESCI 250, PHYSIOL 201; CHEM 130 recommended.*

5. Elective Course Work [20 Credit Hours]

Students must complete a minimum of 20 credit hours of elective course work as follows:

- Movement Science lecture-based courses. A minimum of nine credit hours of upper-division Movement Science lecture-based courses from the following choices:

MOVESCI 421 (3 credits) - Disorders of Voluntary Movement

MOVESCI 422 (3 credits) - Motor Learning

MOVESCI 423 (3 credits) - Sensory-motor Development

MOVESCI 424 (3 credits) - Human Movement & Aging: Changes in Sensorimotor Control

MOVESCI 425 (3 credits) - Motor Behavior and Developmental Disabilities
MOVESCI 426 (3 credits) – Cognitive Neuroscience of Action
MOVESCI 435 (3 credits) – Biomechanics of Human Locomotion
MOVESCI 437 (3 credits) – Motion Capture and Animation for Biomechanics
MOVESCI 441 (3 credits) - Exercise and Human Biology
MOVESCI 442 (3 credits) - Hormones and Exercise
MOVESCI 443 (3 credits) – Human Movement and Aging: Hormones and Nutrition
MOVESCI 471 (3 credits) - Physical Activity, Health and Disease
MOVESCI 474 (3 credits) – Worksite Wellness
AT 420 (3 credits) - Pharmacology for the Allied Health Professions

- **Movement Science independent study courses.** Three credit-hours earned from independent study, internships, readings or research in Movement Science can be substituted for one of the required lecture-based courses, listed above, in Movement Science. The upper limit of independent study courses in Movement Science is 20 credit hours. The courses can be chosen from the following choices:

MOVESCI 280 (1-4 credits) - Kinesiology Undergraduate Research Opportunity
MOVESCI 380 (1-3 credits) - Problems in Movement Science
MOVESCI 381 (1-3 credits) - Community Service Learning
MOVESCI 382 (1-3 credits) - Honors Reading
MOVESCI 384 (1-3 credits) - Honors Research
MOVESCI 390 (1-8 credits) - Field Experience in Movement Science
MOVESCI 402 (1-3 credits) - Teaching Experience in Movement Science
MOVESCI 403 (0.5-4 credits) - Internship
MOVESCI 429 (1-3 credits) - Laboratory Rotation in Motor Control and Development
MOVESCI 439 (1-3 credits) - Laboratory Rotation in Biomechanics
MOVESCI 449 (1-3 credits) - Laboratory Rotation in Exercise Physiology
MOVESCI 488 (1-3 credits) - Independent Study
MOVESCI 489 (1-5 credits) - Senior Thesis
MOVESCI 490 (1-5 credits) - Senior Honors Thesis A
MOVESCI 491 (1-3 credits) - Senior Honors Thesis B

- **Cognate courses.** A minimum of eleven credit hours of cognate elective courses outside of Movement Science, six credit hours of which must be outside of Kinesiology.

These courses may be taken from other units within the School of Kinesiology or outside the School (6 credits minimum). The Movement Science department maintains a list of currently approved [Movement Science Cognate Elective Courses](#) (see below). If a course does not appear on the list, students need to get approval by completing a [Petition Form](#) (available online or in the Kinesiology Office of Student Services). Students are encouraged to choose cognate courses that may fulfill graduate or professional school requirements.

Credit hours are listed in parentheses. Courses fulfilling University distribution requirements are indicated by NS, SS, and HU. Students may petition for courses that do not have specific distribution designation.

PLEASE NOTE: This list is subject to change. Refer to the Kinesiology web site for the most up-to-date list, www.kines.umich.edu/academics/mvs/courses/cognates.html.

Anthropology, Biological

ANTHRBIO 161: Introduction to Biological Anthropology. (4) **NS**

Anthropology, Cultural

ANTHRCUL 258: Culture and Medicine (3)

ANTHRCUL 344: Medical Anthropology (4) **SS**

ANTHRCUL 416: Global Health: Anthropological Perspectives(3)

Biochemistry

BIOLCHEM 451/CHEM 451: Introductory Biochemistry Lecture(3)

BIOLCHEM 451/CHEM 451: Introduction to Biochemistry I (4)

Biology

BIOLOGY 101: Biology and Human Affairs (4) **NS**

BIOLOGY 118: AIDS and Other Health Crises (4) **NS**

BIOLOGY 207: Microbiology, Combined Lecture & Lab (4) **NS**

BIOLOGY 208/MCDB 308: Embryology Lecture & Developmental Bio Lab (3/3) **NS**

BIOLOGY 222: From Message to Mind: An Introduction to Neurobiology (3)

BIOLOGY 225 (325): Principles of Animal Physiology: Lecture (3)

BIOLOGY 226 (326): Animal Physiology Laboratory (2)

BIOLOGY 252: Chordate Anatomy, Combined Lecture & Lab (4)

BIOLOGY 262: Evolutionary Biology & Human Disease, Combined Lecture & Lab (4)
NS

BIOLOGY 305/MCDB 306: Genetics Lecture & Genetics Lab (4/3)

BIOLOGY 310: Introductory Biochemistry (4)

BIOLOGY 311: Introductory Biochemistry (4)

BIOLOGY 324 (224): Biology of Cancer (3) **NS**

BIOLOGY 411: Protein Structure and Function (3)

BIOLOGY/CHEM 415: Introductory Biochemistry Lecture (3)

BIOLOGY 418: Endocrinology (3)

BIOLOGY 423: Introduction to Research in Cellular and Molecular Neurobiology (3)

BIOLOGY 427: Molecular Biology (4)

BIOLOGY 428: Cell Biology (4)

BIOLOGY 436 (336): Introductory Immunology (3)

BIOLOGY 541 Mammalian Reproductive Endocrinology Lecture (4)

Biomedical Engineering

BIOMEDE 295: Biomedical Engineering Seminar (1)

BIOMEDE 417: Electrical Biophysics (4)

BIOMEDE 420: Introduction to Biomechanics (4)

BIOMEDE 456: Biomechanics (3)

Biophysics

BIOPHYS 520 (510/610)/CHEM 520: Biophysical Chemistry I (3)

Chemistry

CHEM 120: The History and Philosophy of Chemistry (3) NS

CHEM 125/126: General and Inorganic Chemistry Lab I and II (2) NS

CHEM 210: Structure and Reactivity I (4) NS

CHEM 211: Investigations in Chemistry (1) NS

CHEM 215: Structure and Reactivity II (3) NS

CHEM 216: Synthesis and Characterization of Organic Compounds (2) NS

CHEM 230: Physical Chemical Principles and Applications (3) NS

CHEM 260: Chemical Principles (3) NS

CHEM 261: Introduction to Quantum Chemistry (1)

CHEM 302: Inorganic Chemistry: Principles of Structure, Reactivity, and Function (3)
NS

CHEM 312: Synthesis and Characterization (2)

CHEM 467/AOSS 467/GEOSCI 465: Biogeochemical Cycles (3)

Complex Systems

BIOLOGY 481: Population Dynamics And Ecology (4)

BIOLOGY 499: Dynamic Systems In Population And Community Ecology (3)

MICRBIOL 201: Elementary Microbiology for Health Professional Students (3)

MICRBIOL 350: Introductory Laboratory in Medical Microbiology (1)

PHYSICS 413: Physics of Complexity (3)

Ecology & Evolutionary Biology

EEB 341: Parasitology, Combined Lecture & Lab (4) NS

Electrical Engineering & Computer Science

EECS 280: Programming and Introductory Data Structures (4)

EECS 284: Introduction to a Programming Language or System (1)

EECS 285: A Programming Language or Computer System (2)

EECS 370: Introduction to Computer Organization (4)

EECS 380: Data Structures and Algorithms (4)

EECS 478: Logic Circuit Synthesis and Optimization (4)

Engineering

ENGR 371: Numerical Methods for Engineers and Scientists (3)

English Language and Literature

ENGLISH 415: Interdisciplinary Approaches to Literature: Research and Technology in the Humanities (3)

History

HISTORY 284: History of Health and Sickness (3-4) **SS**
HISTORY 300: Epidemics Throughout History (3)
HISTORY 302: Science, Technology and Defining the Human (3)
HISTORY 346/NRE 356: Environmental History and the Tropical World (3)
HISTORY 355: Health and Illness in African Worlds (4)
HISTORY 397: Human Nature and its Sciences (4)
HISTORY 427(508): Magic, Religion, and Science in Early Modern England (3)

Industrial & Operations Engineering

IOE 333: Ergonomics (3)
IOE 334: Ergonomics Lab (1)
IOE 433: Occupational Ergonomics (3)
IOE 474: Simulation (3)

LS&A Honors

HONORS 493: Complexity and Emergence

Mathematics

MATH 116: Calculus II (4) **NS**
MATH 214: Linear Algebra and Differential Equations (4) **NS**
MATH 215: Calculus III (4) **NS**
MATH 216: Introduction to Differential Equations (4) **NS**

Mechanical Engineering

MECHENG 211: Introduction to Solid Mechanics (4)
MECHENG 240: Introduction to Dynamics and Vibrations (4)
MECHENG 456: Tissue Mechanics (3)

Medical School

BIOLCHEM 212: Descriptive Biochemistry (3)
BIOLCHEM 451: Introductory Biochemistry (4)
BIOLCHEM 491: Biochemical Basis of Human Diseases and Pathologies (1)
CHEM 398: Undergraduate Research in Chemistry, Biological Chemistry, Biology, and Biophysics (1-8)
MEDADM 599: Special Topics Dissection Elective Lab (1) **NS**

Molecular, Cellular, and Developmental Biology (MCDB)

MCDB 427: Molecular Biology Lecture (4)
MCDB 428: Cell Biology Lecture (4)
MCDB 429: Laboratory in Cell and Molecular Biology (3)

Philosophy

PHIL 232: Problems of Philosophy (4; 2 in half-term) **HU**
PHIL 340: Mind, Matter, and Machines (4; 2 in the half-term) **HU**
PHIL 344: Ethics and Health Care (2-3) **HU**

PHIL 356: Issues in Bioethics (4; 3 in the half-term) **HU**
PHIL 383: Knowledge and Reality (3; 2 in the half-term) **HU**
PHIL 420: Philosophy of Science (3)

Physical Education

PHYSED 373: Issues in Health and Wellness (3)
PHYSED 475: HIV/AIDS, Other Communicable Diseases, and the Immune System (3)

Physics

PHYSICS 126: General Physics: Electricity and Light (4) **NS**
PHYSICS 127: Physics I Lab (1) **NS**
PHYSICS 128: Electricity and Light Lab (1) **NS**
PHYSICS 140/141: Physics 1 Lecture & Lab (4/1) **NS**
PHYSICS 201: Physics, Truth and Consequences (3)
PHYSICS 204: Great Books in Physics (4) **NS**
PHYSICS 240/241 Physics II Lecture & Lab (4/1) **NS**
PHYSICS 401: Intermediate Mechanics (3)

Physiology

PHYSIOL 502: Human Physiology Lecture (4)

Psychology

PSYCH 230: Introduction to Biopsychology (4) **NS**
PSYCH 240: Introduction to Cognitive Psychology (4) **NS**
PSYCH 250: Introduction to Developmental Psychology (4) **SS**
PSYCH 270: Introduction to Psychopathology (4) **SS**
PSYCH 280: Introduction to Social Psychology (4) **SS**
PSYCH 290: Introduction to the Psychology of Personality (4) **SS**
PSYCH 335: Introduction to Animal Behavior (4) **NS**
PSYCH 345: Human Neuropsychology (4) **NS**
PSYCH 347: Perception (3)
PSYCH 351: Advanced Laboratory in Developmental Psychology (3)
PSYCH 355: Cognitive Development (3)
PSYCH 359: Psychology of Aging (3) **SS**
PSYCH 401: Special Problems in Psychology as a Social Science (1-4)
PSYCH 442: Perception, Science, and Reality (3)

Residential College

RCNSCI 263/ENVRNSTD 263: Energy and Environment (4) **NS**
RCNSCI 270: New Biotechnology: Scientific, Social, and Historical Perspectives (4) **NS**
RCNSCI 415: Science and Politics (4)

Sport Management

SM 434: Sport Ethics (3)
SM 437: Psychological Aspects of Sport & Exercise (3)

Sociology

SOC 475: Introduction to Medical Sociology (3)

University Courses

UC 210: Perspectives on Careers in Medicine and Health Care (4)

Women's Studies

WOMENSTD 220: Perspectives in Women's Health (3) SS

WOMENSTD 400: Women's Reproductive Health (3)

WOMENSTD 485: Gender, Mentoring, and Technology (3)

Completion of the BS Degree in Movement Science

The Bachelor of Science degree in Movement Science requires completion of 120 credit hours. To ensure that all degree requirements have been met, students are required to complete a senior audit through the Office of Student Services in the semester before they expect to graduate. To track progress, students are encouraged to update their [Undergraduate Record Sheet](#) each semester. [Undergraduate Record Sheets](#) can be obtained from the Office of Student Services. Students are encouraged to meet with their faculty mentors in Movement Science throughout their degree program.

The Movement Science Honors Program

The Movement Science honors program in Kinesiology offers qualified students advanced coursework and independent research opportunities in exercise physiology, biomechanics, and motor control and development. Students with strong intellectual interests and the commitment to pursue those interests in a rigorous and challenging environment are eligible for the Movement Science honors program.

Honors students are expected to pursue a rigorous and diversified course of study. Students must complete the regular Movement Science curriculum as well as advanced coursework, independent study, and the successful completion of an honors thesis, completed during the senior year. Students must maintain a 3.5 GPA throughout the program. Each April, a subcommittee of the Movement Science faculty will review each student's academic record and recommend continuation or termination. The program will be administered by the Associate Dean for Research.

Admission to the Movement Science Honors Program

The School of Kinesiology is committed to achieving an Honors student body characterized by ethnic and racial diversity as well as gender balance.

Following review of applications for admission to the School of Kinesiology, qualified students will be invited to enter the Honors Program. These invitations are based on

evidence of exceptional scholarly ability and motivation. Admission decisions will be based on the following:

1. high school GPA (suitably adjusted for the difficulty of work elected - typically above 3.8)
2. class standing
3. national test scores (SAT of 1200 or above, ACT composite of 32)
4. counselor/teacher recommendations
5. admissions essay

First-year students already enrolled in Kinesiology who are interested in joining the Honors Program may apply to be considered for the Honors Program. Applications are available in the Office of Student Services and [online](#). Only those students with a GPA of 3.5 in at least one full semester comprised of content-based challenging classes will be admitted to the second year level of the Honors Program.

Second-year Movement Science students may apply to begin the Honors Program as juniors. Only those students with distinguished academic performance (cumulative GPA of 3.5 in a minimum of 50 credit hours, including completion of MOVESCI 250 or equivalent, ENGLISH 225, and all core pre-requisite courses both inside and outside Kinesiology) will be considered for admission.

Movement Science Honors Requirements

The Honors program requires students to take the Honors sections of some Movement Science core courses, and to complete independent research experiences, culminating in a Senior Honors Thesis. Each requirement is described below.

***Honors Sections.** Students complete the honors sections of MOVESCI 320, 330, and 340 by the end of junior year. To receive honors credit, students will complete a special project connected to the course as well as the regular course requirements. In consultation with the faculty instructor, such special projects may, for example, take the form of a literature review or class presentation. Honors students in the same class may work together on a project approved by the faculty instructor. Honors students will fill out a contract with the faculty instructor stating precisely the scope of the honors work. In situations where a student elects to take a core course in his/her second year and has not yet been accepted into the Honors Program, the student must make arrangements with the appropriate faculty member to complete the honors requirement of the core course.*

Honors Independent Study and Honors Research Proposal. Students must complete a minimum of six credits of independent study with a research focus by the end of the junior year. Up to three independent credits obtained prior to a student's junior year can be counted. Honors independent research study experiences typically involve supervised and directed participation in the laboratory of a Movement Science faculty member. In many cases, these independent research study experiences assist the student in identifying a research mentor and help lay the groundwork for the senior honors thesis. Honors

students will fill out an [independent study contract](#) form (available in the Office of Student Services and online) with a faculty member stating the nature of the research experience.

A thesis proposal must be submitted to the sponsoring faculty member by the end of winter semester of student's junior year. The proposal should include a rationale for the project, the specific questions to be answered or hypotheses to be tested, the methods to be used, the potential results of the student's proposed research, and a bibliography. The proposal must include the signature of the faculty mentor indicating support of the proposal. It is highly recommended that students arrange to start doing honors thesis research during the spring and/or summer semesters between their junior and senior years. Typically, financial support will be sought from the faculty mentor. In some instances, some financial support may be available from other sources.

Senior Honors Thesis - MOVESCI 490-491 (5 credits). The honors thesis is due three weeks before the end of the winter semester. In March of each academic year, students will make oral presentations of their thesis work in a School-wide forum, to be arranged with their thesis advisors. While there is no set length requirement, the honors thesis is expected to reflect a rigorous and in-depth analysis of a specific problem in movement science requiring a sustained period of investigation but appropriate for study at the honors undergraduate level. The goal of the honors thesis is to generate new and relevant information that may lead to an abstract submission to a national conference, form the basis for a peer-reviewed manuscript, or provide pilot work for graduate studies.

COMPETENCY CHECK LIST

1. CONTENT EMPHASIS
Students are expected to master key concepts in the three content areas of Movement Science.
2. RESEARCH EXPOSURE
 - a. Exposure to experimental design in MOVESCI 250
 - b. Research exposure in laboratory sections of Movement Science core courses
 - c. Participation in independent study, research laboratory courses, UROP courses (UC 280 and MOVESCI 280), and senior honors courses
3. SCIENTIFIC COMMUNICATION, INCLUDING ORAL, WRITTEN AND GRAPHICS SKILLS
 - a. Oral communication skills
 - Students take SM 101
 - Students present research information in different classes
 - Writing skills
 - Students take MOVESCI 313 – Scientific Writing
 - Students write scientific reports, reviews and essays in different courses
 - Graphic communication skills
 - Students get such skills in the laboratory sections of the required courses.

4. COMPUTER LITERACY
 - a. Exposure to descriptive and inferential statistics in MOVESCI 250
 - b. Exposure in different research experiences and courses

Movement Science Minor for Dance Majors

Kinesiology offers a minor in Movement Science to School of Music students only. The Movement Science minor is a course of study focused on the fundamental aspects of human performance. Upon completion of the minor, students will have a broad understanding of the biological and behavioral aspects of human movement.

A minor in Movement Science requires no less than 17 credits of course work that show structure and coherence. All 17 credits are taken in-residence. Students who declare and complete an approved academic minor will receive a notation on their student transcript but not on their diploma.

Policies

1. Each student who wishes to complete an approved academic minor must develop a plan for the academic minor in consultation with a Movement Science faculty member, who must also approve it.
2. After developing a plan for an academic minor, the student works with the Kinesiology Office of Student Services to have the academic minor entered on the student's record.
3. An individually designed academic minor is not allowed.
4. Courses in the academic minor must be elected for a grade.
5. Students may not use more than one course to meet the requirements of both a concentration plan and an academic minor.
6. Courses elected to meet the requirements of an academic minor may be part of the student's area distribution plan.
7. A student must earn an overall GPA of at least 2.0 in the academic minor.
8. No course may be used to satisfy the requirements of more than one academic minor.

Required Courses

1. Requirement courses. Students are required to take the following two courses:
MOVESCI 110 (3) - Biological and Behavioral Bases of Human Movement
(fall/winter)
AT/PHYSED 310 (5) - Applied Human Anatomy and Physiology (*MOVESCI 110*)
(winter), or equivalent
2. Elective courses. Students choose courses that total 9 credit hours or more. Two of the courses must be Movement Science courses. Any Movement Science course at the 300 or 400 level can be elected except independent study courses. Other courses can be chosen from the following list.

AT 115 (3) - Prevention and Care of Athletic Injuries (winter)
MOVESCI 230 (4) – Human Musculoskeletal Anatomy (fall/winter)
MOVESCI 240 (3) - Introduction to Fitness and Health (fall)
MOVESCI 241 (3) - Exercise, Nutrition and Weight Control (fall/winter)
AT 326/PHYSED 326 (3) – Fundamentals of Strength and Conditioning (*PHYSED 310*)
(fall)
PHYSED 332 (3) - Principles of Motor Behavior (*PHYSED 310*) (winter)

Physical Education Major

The Physical Education major offers students extensive preparation in theory and methodology courses leading to K-12 certification, as well as providing students with preparation in the liberal arts. Students in Physical Education learn how to communicate to students of varying ages, abilities, and backgrounds on the intellectual, physiological, and biomechanical concepts of physical activity. The Physical Education curriculum includes grades K-6 and grades 7-12. Methods courses required of all students, emphasizes the importance of understanding the role of family, community, and school in a student's educational experience, and of psychological and sociological factors that can influence learning. Peer teaching, practicum experience, and exposure to state and national standards related to teaching Physical Education comprise the strong theoretical core of the curriculum. The directed teaching requirement provides students with the opportunity to gain practical teaching experience under the supervision of both K-12 and University faculty.

Students who complete the Physical Education program will receive a Bachelor of Science (B.S.) degree in Kinesiology and a Michigan Secondary Provisional Certificate (K-12). For further information about Physical Education Program requirements, admission procedures, and application deadlines, students should consult the Physical Education Chair within Kinesiology.

The School of Education Office of Student Services also assists students in applying to the program and reviewing Physical Education requirements. This office, along with the Kinesiology Office of Student Services and the Physical Education Chair are the three main sources of information and support for Physical Education students.

Physical Education Admission Criteria

Students apply to the Physical Education Teacher Certification program with a second-level application through the School of Education. Each applicant is evaluated on the basis of probable success in teaching and availability of places in the program. Students may apply as sophomores to begin the program as juniors.

The criteria for admission include:

- A minimum 2.5 overall grade point average with particular attention given to courses required for certification.