

PHILOSOPHY

810*. **Seminar in the History of Philosophy**
 Fall. 2 to 4 credits. May reenroll for a maximum of 10 credits.
 R: Graduate standing or approval of the department.
 Major thinkers, themes, periods, or movements in the history of Philosophy.
 QA: PHL825

820*. **Seminar in Continental Philosophy**
 Fall of even-numbered years. 2 to 4 credits. May reenroll for a maximum of 10 credits.
 R: Graduate standing or approval of department.
 Major figures or themes in 19th and 20th century continental philosophy.
 QA: PHL825 PHL841 PHL860

830*. **Seminar in Logic and the Philosophy of Language**
 Fall of odd-numbered years. 2 to 4 credits. May reenroll for a maximum of 10 credits.
 R: Graduate standing or approval of department.
 Selected topic in Philosophy of Language, Philosophical Logic, and Metatheory.
 QA: PHL837 PHL870

840*. **Seminar in Value Theory**
 Fall. 2 to 4 credits. May reenroll for a maximum of 10 credits.
 R: Graduate standing or approval of department.
 Major figures, themes, or periods in ethics or aesthetics.
 QA: PHL830

845*. **Seminar in Business Ethics**
 Spring. 3(3-0) Interdepartmental with the Department(s) of General Business and Business Law.
 R: Graduate standing or approval of department.
 Ethical dimensions of such issues as corporate responsibility, preferential hiring, advertising, government regulation.
 QA: PHL805

850*. **Seminar in Social and Political Philosophy**
 Spring of even-numbered years. 2 to 4 credits. May reenroll for a maximum of 10 credits.
 R: Graduate standing or approval of department.
 Major figures, themes, or periods in social and political philosophy.
 QA: PHL860

860*. **Seminar in Metaphysics and Epistemology**
 Fall. 2 to 4 credits. May reenroll for a maximum of 15 credits.
 R: Graduate standing or approval of department.
 Selected topics in metaphysics, epistemology, and philosophy of mind.
 QA: PHL841 PHL845

870*. **Seminar in Philosophy of Health Care**
 Fall. 2 to 4 credits. May reenroll for a maximum of 15 credits.
 R: Graduate standing or approval of department.
 Ethical, political, theoretical, and methodological issues in medicine and health care.

880*. **Seminar in Philosophy of Science**
 Spring. 2 to 4 credits. May reenroll for a maximum of 10 credits.
 R: Graduate standing or approval of department.
 Selected topics in the philosophy of the special sciences, in the metatheory of science, and in the social studies of science.
 QA: PHL880

890*. **Independent Study**
 Fall, Spring, Summer. 1 to 10 credits. May reenroll for a maximum of 20 credits.
 R: Approval of the Department
 Special projects, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.
 QA: PHL 890

894*. **Practicum in Philosophy of Health Care**
 Spring. 4 to 6 credits.
 P: PHL 344 R: Doctoral Standing or approval of department.
 Study of ethical and policy issues in hospital and governmental agency settings.

899*. **Master's Thesis Research-Plan A**
 Fall, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits.
 R: Approval of the Department
 Directed research leading to a master's thesis, used in partial fulfillment of plan A master's degree requirements.
 QA: PHL 899

999*. **Doctoral Dissertation Research**
 Fall, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 50 credits.
 R: Approval of the Department
 QA: PHL 999

PHYSICAL EDUCATION AND EXERCISE SCIENCE PES

101*. **Aquatics**
 Fall, Spring, Summer. 1(0-3)
 R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 8 credits in PES 101 through PES 108.
 Skill and knowledge development in water-related activities. Separate course sections in activities such as swimming, diving, lifeguarding, water polo, and sailing.
 QA: HCP 109

102*. **Combative Sports**
 Fall, Spring, Summer. 1(0-3)
 R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 8 credits in PES 101 through PES 108.
 Skill and knowledge development in the art or sport of physical training. Separate course sections in activities such as judo, karate, aikido, and fencing.

103*. **Conditioning**
 Fall, Spring, Summer. 1(0-3)
 R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 8 credits in PES 101 through PES 108.
 Knowledge and competency in physical fitness activities that emphasize cardiovascular and muscular training. Separate course sections in activities such as aerobic exercise, power walking, swim conditioning, and weight training.

104*. **Dance**
 Fall, Spring, Summer. 1(0-3)
 R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 8 credits in PES 101 through PES 108.
 Skill and knowledge development in dance activities. Separate course sections in dance styles such as ballet, modern, jazz, Latin, and social.
 QA: HCP 211 HCP 111

105*. **Gymnastics**
 Fall, Spring, Summer. 1(0-3)
 R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 8 credits in PES 101 through PES 108.
 Skill and knowledge development in gymnastics. Separate sections in activities such as apparatus, tumbling, and floor exercise.
 QA: HCP 110

106*. **Individual Sports**
 Fall, Spring, Summer. 1(0-3)
 R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 8 credits in PES 101 through PES 108.
 Skill and knowledge development in individual sports. Separate course sections in activities such as bowling, golf, skating, self defense, and track and field.
 QA: HCP 104 HCP 105

107*. **Racquet Sports**
 Fall, Spring, Summer. 1(0-3)
 R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 8 credits in PES 101 through PES 108.
 Skill and knowledge development in racquet sports. Separate course sections in sports such as badminton, racquetball, and tennis.
 QA: HCP 106 HCP 107

108*. **Team Sports**
 Fall, Spring, Summer. 1(0-3)
 R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Student are limited to a combined total of 8 credits in PES 101 through PES 108.
 Skill and knowledge development in team sports. Separate course sections in sports such as basketball, ice hockey, lacrosse, soccer, softball, and volleyball.
 QA: HCP 108

120. **Personal Health**
 Fall, Spring, Summer. 3(3-0)
 Physical, mental, emotional, social, and spiritual domains of health. Alternative health values and behaviors. Developing healthy lifestyles.
 QA: HCP 120

121. **The Healthy Lifestyle**
 Fall, Spring, Summer. 3(2-2)
 Cardiovascular risk factors, lifestyle habits, and aerobic capacities and their relationship to optimal health and longevity. Individual physical activity required as part of the course.
 QA: HCP 270

125. **First Aid and Personal Safety**
 Fall, Spring, Summer. 3(3-0)
 Knowledge and application of first aid concepts relating to respiratory and cardiopulmonary disorders, shock, wounds, burns, fractures, drug poisoning, childbirth, litigation. Preventing trauma by recognizing and avoiding safety hazards.
 QA: HCP 125

PHYSICAL EDUCATION AND EXERCISE SCIENCE

170*. Foundations of Physical Education and Exercise Science
Fall, Spring. 2(2-0)

Physical education and exercise science as a disciplinary major. Subdisciplines and professions. Historical perspectives.
QA: HCP 135

171*. Athletics in Higher Education
Fall. 1(1-0)

Philosophy and organization of athletics. Athletics and academic achievement. Ethical issues, legal issues, social conduct, eligibility, athlete's rights and responsibilities. Coaches' responsibilities and institutional obligations.
QA: HCP 130

201*. Water Safety Instruction
Fall, Spring. 2(1-2)

Knowledge and skills necessary to plan and conduct American Red Cross water safety courses. Current lifesaving certification is assumed.
QA: HCP 345

202*. Aerobic Exercise Instruction
Fall, Spring. 3(2-3)

Theory and practice for aerobic exercise leaders. Functional effects of physical activity. Safe exercise techniques. Modifications and precautions for special populations. Choreography practice. Health and exercise screening. Legal issues.
QA: HCP 470

216*. Applied Human Anatomy
Fall. 3(3-0)

R: Not open to freshmen. Open only to students in Physical Education and Exercise Science. Structural anatomy of the human body. Interrelationships of structure, function, and human movement.
QA: ANT 216

217*. Applied Human Anatomy Laboratory
Spring. 1(0-3)

P: PES 216 R: Sophomores and above
Physical Education and Exercise Science
Identification, orientation, and position of major bones, muscles, nerves, vessels, and organs of the human body. Articulations, muscle origins, muscle insertations, and prime moving actions.
QA: ANT 216

250*. Measurement in Physical Education and Exercise Science
Fall, Spring. 3(3-0)

Methods and materials for measurement and evaluation. Motor skills, physical fitness, knowledge, and attitudes associated with physical activity.
QA: HCP 240

260*. Physical Growth and Motor Behavior
Fall, Spring. 3(3-0)

R: Not open to freshmen.
Physical growth and biological maturity as related to motor performance and skill learning. Sequential progressions of fundamental motor skills. Physical fitness of children and youth. Motor abilities. Stages of skill acquisition.
QA: HCP 260

310*. Physiological Bases of Physical Activity
Fall, Spring. 3(3-0)

P: PSL 250, CEM 141, PES 216, PES 217.
R: Open only to Physical Education and Exercise Science majors.
Acute and chronic effects of exercise on various body systems. Principles of training, exercise prescription, and the role of physical activity in health and disease.
QP: PSL 240 PSL 241 ANT 216 QA: HCP 246

316*. Community Health Problems
Spring. 2(2-0)
P: PES 120.

Community health problems and needs. Special attention to various health organizations working toward the solution of these problems.
QP: HCP 120 QA: HCP 316

320*. Athletic Training
Fall, Summer. 3(3-0)
P: PES 125, PES 216, PES 217, PES 310 or concurrently. R: Not open to freshmen.

Athletic injury recognition, prevention, evaluation, management, care, counseling, and rehabilitation. Organization and administration.
QP: HCP 125 ANT 216 QA: HCP 306

328*. School Health Problems
Spring. 2(2-0)
P: PES 120.

Health problems of school-age children. Special attention to school health services and healthful school living.
QP: HCP 120 QA: HCP 328

330*. Structural and Mechanical Analysis of Physical Activity
Fall, Spring. 3(2-2)
P: PES 216, PES 217, PHY 231.

Biomechanical analysis of human movement based upon musculoskeletal structure and function. Mechanical principles.
QP: ANT 216 QA: HCP 252 HCP 253

340*. Psychological Bases of Physical Activity
Fall, Spring. 3(3-0)
P: PES 260 or concurrently. R: Not open to freshmen.

Psychological factors affecting motor skill acquisition and performance. Psychological skills which enhance sport performance. Applications of learning theory.
QA: HCP 261

382A*. Coaching Baseball
Fall. 2(1-2)

Techniques for coaching baseball. Rules, strategies, and training. Development and evaluation of player skills. Planning, conducting, and evaluating practices.
QA: HCP 349

382B*. Coaching Sports for Athletes with Disabilities
Spring of even-numbered years. 2(2-0)
Interdepartmental with the Department(s) of Park and Recreation Resources.

Techniques for coaching athletes with disabilities. Rules, strategies, and training. Developing and evaluating player skills. Planning, conducting, and evaluating sport practices. Injury prevention. Health and safety concerns.

382C*. Coaching Soccer
Spring. 2(1-2)

Techniques for coaching soccer. Developing and evaluating player and team skills. Planning, conducting and evaluating practices and games. Rules, drills, strategies and training.

400*. Principles of Coaching I
Fall. 4(4-0)

Basic principles of anatomy, biomechanics, and physiology for coaching competitive sports. Applications to athletes of different ages and abilities.
QA: HCP 246 HCP 252 HCP 253

401*. Principles of Coaching II
Spring. 4(4-0)

Sociological, administrative, philosophical, legal, ethical, and chemical health issues related to coaching competitive sports. Applications to athletes of different ages and abilities.
QA: HCP 480

402*. Sports, Physical Education, and the Media
Spring, Summer. 3(2-2)
R: Not open to freshmen

Sports and physical education programs as presented in print and electronic media. Supervised practice in oral and written communications with sports media.

405*. School Health Program
Fall. 2(2-0)
P: PES 120

Coordination of school health with other school programs, outside agencies, and the community. Policies governing the administration of staff, facilities, and program.
QP: HCP 120 QA: HCP 405

407*. Safety Education
Fall. 2(2-0)
P: PES 120.

Safety problems in home, school, and community. Safety programs in elementary, junior, and senior high schools.
QP: HCP 120 QA: HCP 407

420*. School Health Education
Fall. 3(3-0)
P: PES 120. R: Not open to freshmen and sophomores.

Organization and administration of a comprehensive school health education program. Interaction of school health services, healthful environment, and health instruction in the development of a healthy lifestyle.
QP: HCP 120 QA: HCP 328 HCP 405

421*. Advanced Athletic Training
Spring. 3(3-0)
P: PES 320, PES 330 or concurrently. R: Not open to freshmen and sophomores.

Advanced knowledge and skills of athletic health care. Current issues of rehabilitation, organization and administration, therapeutic modalities, and injury evaluation.
QP: HCP 306 QA: HCP 406

422*. Advanced Rehabilitation of Athletic Injuries
Spring of odd-numbered years. 3(3-0)
P: PES 421. R: Not open to freshmen and sophomores.

Rehabilitation and therapeutic modalities used to manage athletic injuries. Anatomical and neurophysiological bases of techniques. Indications and contraindications of rehabilitation protocols.
QP: HCP 406

445*. Sociocultural Analysis of Physical Activity
Fall, Spring. 3(3-0)
R: Open only to seniors or graduate students.

Sociocultural context of and social practices in sport and physical activity.
QA: HCP 310

450*. Design and Evaluation of Physical Activity Programs
Spring. 3(3-0)

Development and evaluation of programs in physical education and exercise science.
QA: HCP 415

451*. Physical Education in Preschools and Elementary Schools
Fall. 3(1-5)
P: PES 260 or PES 460. R: Not open to freshmen and sophomores. Not open to students with credit in TE 302.

Methods of instruction for teaching physical activities to preschool and elementary school children. Development of teaching sequences. Clinical experience in teaching children and peers.
QP: HCP 440 ORHCP 260 QA: HCP 441 HCP 442

PHYSICAL EDUCATION AND EXERCISE SCIENCE

452*. **Physical Education in Middle and High Schools**
 Spring. 3(2-3)
 P: PES 106, PES 107, PES 108 and PES 340.

R: Open only to seniors and graduate students. Methods of instruction for teaching physical activities to middle and high school students. Development of teaching sequences. Clinical experience in teaching students and peers.
 QP: HCP 260 ORHCP 440 QA: TE 330

453*. **Administration of Intramural Sports Programs**
 Spring. 2(2-0)

R: Not open to freshmen and sophomores. Organization and administration of intramural programs in educational settings. Philosophy, values, planning, scheduling, competitive units, classification systems, budgeting, facilities, officiating, clubs, issues, and trends.
 QA: HCP 418

454*. **Facility Planning and Construction**
 Spring. 3(3-0)

R: Not open to freshmen or sophomores. Planning of athletic and physical education facilities such as gymnasias, ice rinks, swimming pools, and outdoor areas. Space utilization standards and guidelines. Selection of materials and equipment.
 QA: HCP 404

460*. **Developmental Bases of Motor Skills**

Fall, Spring, Summer. 2(2-0)
 R: Open only to College of Education and College of Human Ecology majors. Not open to students with credit in PES 260.

Influence of physical growth and biological maturation on motor skill development. Sequential progressions of fundamental motor skills. Gross motor dysfunction and health-related fitness of children. Techniques of helping children to acquire skills.
 QA: HCP 440

461*. **Developmental Bases of Motor Skills Laboratory**

Fall, Spring, Summer. 1 to 4 credits.
 May reenroll for a maximum of 4 credits.
 P: PES 460. R: Students must apply one term in advance of enrollment.

Application of concepts related to physical growth and motor development. Practice in planning and teaching fundamental motor skills. Methods of evaluating teaching.
 QA: HCP 440

465*. **Physical Activity for Special Populations**

Fall, Spring. 3(2-2)
 R: Not open to freshmen or sophomores. Methods and materials for teaching physical activity in school and community settings for persons with disabilities and youths at risk.
 QA: HCP 452

466*. **Practicum in Adapted Physical Activity**

Fall, Spring, Summer. 1 to 4 credits.
 May reenroll for a maximum of 4 credits.
 R: Approval of department. Supervised teaching of physical activities and/or coaching sports to persons with disabilities and youths at risk.
 QA: HCP 453

470*. **Proseminar in Physical Education and Exercise Science**

Fall, Spring. 3(3-0)
 R: Open only to seniors and graduate students. Philosophical perspectives in physical education, sport, and exercise science.
 QA: HCP 425

482*. **Topics in Physical Education and Exercise Science(MTC)**
 Fall, Spring, Summer. 3(3-0) May reenroll for a maximum of 6 credits.

Issues, problems, and/or topics in physical education and exercise science.
 QA: HCP 482

490*. **Independent Study**
 Fall, Spring, Summer. 1 to 4 credits.
 May reenroll for a maximum of 4 credits.

R: Approval of department. Supervised individual or group study in various fields of emphasis in physical education and exercise science.
 QA: HCP 424

494*. **Fieldwork**
 Fall, Spring, Summer. 1 to 4 credits.
 May reenroll for a maximum of 4 credits.

R: Approval of department. Supervised practice in teaching physical education activities, coaching sports, administering sports programs, or conducting research or service activities in physical education and exercise science.
 QA: HCP 390 HCP 403

810*. **Physiology of Physical Activity**

Fall. 3(3-0)
 R: Graduate students. Acute and chronic effects of exercise on the various body systems. Practical application of knowledge for training. Program design and discussion of issues in exercise physiology.

811*. **Methods of Physiological Evaluation and Exercise Prescription**

Fall. 2(0-4)
 P: PES 810 or concurrently R: Graduate students. Techniques in evaluation of physiological capacity and in exercise prescription for various population groups.
 QA: HCP 823 HCP 826

812*. **Cardio-Respiratory and Metabolic Responses to Exercise**

Spring of even-numbered years. 3(3-0)
 P: PES 810 R: Graduate students. Acute and chronic effects of exercise on energy metabolism, cardiovascular, and respiratory system functions. Role of these systems in limiting exercise performance.
 QA: HCP 824

813*. **Neuromuscular and Endocrine Responses to Exercise**

Spring of odd-numbered years. 3(3-0)
 P: PES 810 R: Graduate students. Acute and chronic effects of exercise on nervous, muscular, and endocrine systems functions. Role of these systems in limiting exercise performance.
 QA: HCP 825

830*. **Biomechanical Analysis of Physical Activity**

Fall. 3(2-2)
 R: Graduate students. Kinematic analysis of mechanical and anatomical characteristics in performing physical activity and sport skills.
 QA: HCP 853

831*. **Advanced Biomechanics of Physical Activity**

Spring of even-numbered years. 3(3-0)
 Interdepartmental with the Department(s) of Biomechanics.
 P: PES 830 R: Graduate students. Three-dimensional analyses of human motion in sport activities with emphasis on maturation level, performance level, and injury cause/prevention.
 QP: HCP 853 QA: HCP 854

840*. **Psychosocial Aspects of Physical Activity**

Fall. 3(3-0)
 R: Graduate students. Social psychology of sport and physical activity.
 QA: HCP 835 HCP 836

845*. **Sociocultural Practices in Sport**

Spring of odd-numbered years. 3(3-0)
 R: Graduate students. Critical, conflict, and feminist theoretical perspectives to explore dominant ideologies and social practices in sport.

851*. **Curriculum and Instruction in Physical Activity Programs**

Spring of even-numbered years. 3(3-0)
 R: Graduate students. Curriculum theory and models in physical education and exercise science. Interaction of curriculum and instructional decision making in physical education and exercise science.
 QA: HCP 863 HCP 867

852*. **Evaluation of Physical Activity Programs**

Spring of odd-numbered years. 3(3-0)
 R: Graduate students. Skills and knowledge necessary to design, implement, analyze, interpret, and report program evaluations in physical education and exercise science.
 QA: HCP 864

853*. **Athletic Administration in Higher Education**

Spring. 3(3-0)
 R: Graduate students. Organization and administration of athletic programs in higher education. Administrative theory, structure and budget. Facilities, athletic equipment and marketing. Legal, medical and safety aspects.
 QA: HCP 860

860*. **Growth and Motor Behavior**

Fall. 3(3-0)
 R: Graduate students. Motor development and behavior across the lifespan. Developmental skill sequences. Correlates of growth and motor behavior. Relationships among growth, maturation, and motor behavior. Individual and gender differences.
 QA: HCP 816 HCP 817

861*. **Growth, Maturation, and Physical Activity**

Spring of even-numbered years. 3(3-0)
 R: Graduate students. Methods of assessing physical growth, biological maturation, and motor performance. Development of tissues and organs. Development of motor components. Influences of gender and age on growth and performance.
 QA: HCP 816 HCP 817

862*. **Motor Skill Learning**

Spring of odd-numbered years. 3(3-0)
 R: Professional and graduate level students. Learning and performance theory applied to gross motor skills with emphasis on neuropsychological and human performance models. Conditions influencing skill acquisition.
 QA: HCP 819

865*. **Curriculum and Instruction in Adapted Physical Education**

Fall of even-numbered years. 3(3-0)
 R: Graduate students. Designing and implementation of curricula and effective instruction in physical education for students with disabilities.
 QA: HCP 845A

PHYSICAL EDUCATION AND EXERCISE SCIENCE

- 866*.** *Research on Sports for Athletes with Disabilities*
Fall of odd-numbered years. 3(3-0)
R: Graduate students
Performance capabilities of athletics with disabilities with emphasis on areas such as exercise physiology, sport biomechanics, sport psychology, sport sociology, motor development, and motor learning.
QA: HCP 845B
- 867*.** *Practicum in Adapted Physical Activity*
Fall, Spring, Summer. 1 to 4 credits.
May reenroll for a maximum of 4 credits.
R: Graduate student Approval by instructor
Supervised practice in teaching physical activities and/or coaching sports for persons with disabilities.
QA: HCP 845C
- 870*.** *Physical Activity and Well-Being*
Fall. 3(3-0)
R: Graduate students
Relationship of physical activity to human well-being. Influence of growth, biological maturity, aging, body composition, nutrition, training, and rest on health and performance.
- 871*.** *Research Methods in Physical Education and Exercise Science*
Spring. 3(3-0)
R: Graduate students
Research and analytical methodology in physical education and exercise science, including survey, qualitative, historical, philosophical, descriptive, meta-analytical, creative, and experimental methods.
QA: HCP 802
- 882*.** *Topics in Physical Education and Exercise Science(MTC)*
Fall, Spring, Summer. 2 to 3 credits.
May reenroll for a maximum of 9 credits.
R: Graduate students
Issues, problems, and/or topics in physical education and exercise science.
- 882A*.** *Stress Management Techniques in Athletics*
Summer. 3(3-0)
R: Graduate students
Theoretical bases of psychological stress. Impact of stress on performance. Application of appropriate stress management techniques to athletics. Application of research to working with athletes.
- 890*.** *Independent Study in Physical Education and Exercise Science*
Fall, Spring, Summer. 1 to 6 credits.
May reenroll for a maximum of 6 credits.
R: Graduate students
Independent study of topics in physical education and exercise science.
- 893*.** *Internship in Physical Education and Exercise Science*
Fall, Spring, Summer. 2 to 6 credits.
May reenroll for a maximum of 6 credits.
R: Graduate students Must complete a total of 4-6 credits to receive a grade.
Internship experience under the guidance and supervision of MSU faculty and internship consultants.
- 894*.** *Field Experiences in Physical Education and Exercise Science*
Fall, Spring, Summer. 1 to 6 credits.
May reenroll for a maximum of 6 credits.
R: Graduate students Approval by department
Supervised graduate practica and observations in physical education and exercise science in schools and other settings.

- 897*.** *Project in Physical Education and Exercise Science*
Fall, Spring, Summer. 1 to 4 credits.
May reenroll for a maximum of 4 credits.
R: Graduate students Must complete a total of 4 credits to receive a grade.
Project experience under the guidance and supervision of MSU faculty.
- 899*.** *Master's Thesis Research*
Fall, Spring, Summer. 1 to 6 credits.
May reenroll for a maximum of 6 credits.
P: PES 871 R: Graduate students Must complete a total of 6 credits to receive a grade
QP: HCP 802
- 910*.** *Current Issues in Exercise Physiology*
Spring. 3(3-0) May reenroll for a maximum of 9 credits.
R: Graduate students
Selected issues in exercise physiology and related fields of study.
- 930*.** *Current Issues in Biomechanical Aspects of Physical Activity*
Spring. 3(3-0) May reenroll for a maximum of 9 credits.
P: PES 830 R: Graduate students
Selected issues of biomechanical analyses of sport and physical activity.
- 940*.** *Current Issues in Psychosocial Aspects of Physical Activity*
Fall. 3(3-0) May reenroll for a maximum of 9 credits.
R: Graduate students
Selected issues in the psychology and sociology of sport and physical activity.
- 950*.** *Current Issues in the Design and Evaluation of Physical Activity Programs*
Fall. 3(3-0) May reenroll for a maximum of 9 credits.
R: Graduate students
Selected issues in program design and evaluation with an emphasis on programs of physical activity.
- 960*.** *Current Issues in Motor Behavior*
Spring. 3(3-0) May reenroll for a maximum of 9 credits.
R: Graduate student
Selected issues in motor development, motor learning, adapted physical education, and related fields of study.
- 990*.** *Independent Study in Physical Education and Exercise Science*
Fall, Spring, Summer. 1 to 6 credits.
May reenroll for a maximum of 6 credits.
R: Doctoral students
Independent study of topics in physical education and exercise science.
- 995*.** *Research Practicum in Physical Education and Exercise Science*
Fall, Spring, Summer. 1 to 4 credits.
May reenroll for a maximum of 4 credits.
R: Open only to doctoral students
Supervised research practicum. Design, execution, analysis, presentation, critique, and revision of research projects.
- 999*.** *Doctoral Dissertation Research*
Fall, Spring, Summer. 0(-) May reenroll for a maximum of 24 credits.
R: Doctoral students

PHYSICAL SCIENCE CEM

- 918*.** *Seminar in Inorganic Chemistry*
Fall, Spring. 1(1-0) May reenroll for a maximum of 3 credits.
R: Graduate students Natural Science
Chemistry
Discussions of recent advances in inorganic chemistry and reports by graduate students on research
QA: CEM 918
- 991*.** *Quantum Chemistry and Statistical Thermodynamics I*
Fall. 3(3-0)
Mathematical background for quantum chemistry and statistical thermodynamics. Principles of quantum chemistry and applications to chemical problems. Partition functions, spectroscopic measurements, and thermodynamic applications
QA: CEM 987 CEM 991 CEM 985
- 998*.** *Seminar in Physical Chemistry*
Fall, Spring. 1(1-0) May reenroll for a maximum of 3 credits.
R: Graduate students Natural science
Chemistry
Discussions of recent advances in physical chemistry and reports by graduate students on research problems
QA: CEM 998

PHYSICS PHY

- 170*.** *Investigations in Physics*
Fall. 3(0-6)
Experiments in optics, electronics, sound and mechanics; analysis of data using computers, library research and oral presentations.
- 181B*.** *Basic Physics I, CBI*
Fall, Spring, Summer. 3(-)
P: MTH 132 or concurrently. R: Not open to students with credit in PHY 231 or PHY 231B or PHY 183 or PHY 183B or PHY 193H.
Newton's laws of motion, conservation of angular momentum, energy conservation, thermal physics, waves, and sound. Competency based instruction.
QP: MTH 112 QA: PHY 281 PHY 237B PHY 237 PHY 287 PHY 287B
- 182B*.** *Basic Physics II, CBI*
Fall, Spring, Summer. 3(-)
P: PHY 181B or PHY 183 or PHY 183B or PHY 231 or PHY 231B. R: Not open to students with credit in PHY 232 or PHY 232B or PHY 184 or PHY 184B or PHY 294H.
Electricity and magnetism, optical phenomena, interference and diffraction of light, atomic and subatomic topics. Competency based instruction.
QP: PHY 281 ORPHY 237ORPHY 237B OR PHY 291H LBS 267 QA: PHY 282 PHY 283B PHY 238 PHY 238B PHY 239 PHY 292H
- 183.** *Physics for Scientists and Engineers I*
Fall, Spring. 4(5-0)
P: MTH 132 or concurrently. R: Not open to students with credit in PHY 183B, PHY 231, PHY 231B.
Mechanics, Newton's laws, momentum, energy conservation laws, rotational motion, oscillation, gravity, waves.
QA: PHY 287 PHY 287B PHY 291H PHY 237 PHY 281'
- 183A*.** *Physics I, CBI*
Fall, Spring, Summer. 1(-)
P: PHY 181B. R: Not open to students with credit in PHY 183 or PHY 183B.
Topics from: frames of reference, special relativity, rocket equation, forced oscillations, resonances, fluid motion, numerical solutions, moments of inertia, gyroscopic motion. This course plus PHY 181B is equal to PHY 183B.
QP: PHY 281 QA: PHY 287A