Kinesiology Course Descriptions
(graduate level and study abroad)

UPDATED 10/08/09

Prerequisites are listed *in italics.*
Terms offered are CAPITALIZED.

KINESLGY 302. Kinesiology Study Abroad (1-18). *Permission of instructor.* Students planning to study for fall, winter, spring, or summer on School of Kinesiology approved programs should register under Kinesiology. Separate course sections will be listed for each different study abroad destination. **FALL/ WINTER/ SPRING/ SUMMER. Instructor(s): STAFF**

KINESLGY 402. Teaching Experience for Kinesiology Students (1-3). *Graduate status; permission of instructor.* Students participating in this course are responsible for: (1) aiding regularly assigned teaching faculty in a particular course; (2) providing tutorial help for undergraduate students enrolled in the course they are assisting in; (3) meeting regularly with discussion and/or laboratory sessions, where relevant; (4) participating with teaching faculty in instructional activities. May be repeated once in a different area or with a different professor. Credits count as Kinesiology elective credit. **FALL/WINTER. Instructor(s): STAFF**

KINESLGY 414/PHYSED 414/EDUC 314. Directed Teaching Seminar (1-2). *Graduate status; KINESLGY 444/PHYSED 444/EDUC 307; EDUC 391, EDUC 392; concurrent enrollment in KINESLGY 415*. Drawing on the directed teaching experience, this seminar is designed to explore the theories and practices of physical education as students apply them in their directed teaching environments. **FALL/WINTER. Instructor(s): Van Volkinburg**

KINESLGY 415/PHYSED 415/EDUC 315. Directed Teaching in Physical Education (6-12). *Graduate status; KINESLGY 444/PHYSED 444/EDUC 307; EDUC 391; EDUC 392. Concurrent enrollment in KINESLGY 414*. Designed to provide practical experience and to develop teaching competencies under the joint supervision of University and K-12 school personnel. **FALL/WINTER. Instructor(s): Van Volkinburg**

KINESLGY 421/MOVESCI 421. Disorders of Voluntary Movement (3). *Graduate status; MOVESCI 320 or permission of instructor*. An introduction to a variety of common diseases or conditions such as cerebral palsy, stroke, multiple sclerosis, and Parkinson's Disease which affect voluntary movement. Emphasis is placed on relating structure to function and the application of motor control principles in describing conditions characterized by sensorimotor deficits. This course will be of interest to students considering careers in neurorehabilitation or other health-related fields. **FALL or WINTER, AS ARRANGED**. **Instructor(s): Brown**

KINESLGY 422/MOVESCI 422. Motor Learning (3). *Graduate status; MOVESCI 320 or permission of instructor.* Covers theories including conventional information, progressing theories, and connectionist (neural networks) models, theories of motor learning, the effects of different practice regimens, feedback, context and other effects of learning environments. Also considers the neural basis of motor learning and adaptation in humans. **AS ARRANGED. Instructor(s): STAFF**

KINESLGY 423/MOVESCI 423. Sensorimotor Development (3). *Graduate status; MOVESCI 320 or permission of instructor.* The purpose of this course is to study major concepts and principles fundamental to the development of sensorimotor behavior from fetal to late childhood. The overall question for this class is: How and why patterns of motor behavior change? We will study subsystems that affect behavior in real time and over developmental time. This course is intended for pediatric practitioners as well as people interested in basic science issues. We will study the origins of new motor patterns as well as the improvement of motor performance with special emphasis in the development of the nervous system from fetal to early childhood life. We will

discuss observable and "classic" changes in motor skill that occur over time, and we will examine and discuss methods to assess motor performance. **FALL OR WINTER, AS ARRANGED. Instructor: B. Ulrich**

KINESLGY 424/MOVESCI 424. Human Movement & Aging: Changes in Sensorimotor Control (3). *Graduate status; MOVESCI 320 or permission of instructor.* This course focuses on age-related changes in human movement, particularly as they relate to upper limb control. Changes in the sensory, neuromuscular, and central neural systems will be addressed, as well as the development of adaptive strategies and the application of various therapeutic techniques to enhance motor performance. Disease conditions such as Parkinson's and Alzheimer's, commonly associated with the elderly, will also be discussed. While being primarily a survey course, recent experimental findings will be incorporated where appropriate. This course is relevant for those students considering careers in health care delivery with an emphasis on older populations. **FALL OR WINTER, AS ARRANGED. Instructor(s): Brown, Seidler**

KINESLGY 425/MOVESCI 425/PHYSED 425. Motor Behavior and Developmental Disabilities (3). *Graduate status.* This course is designed to provide students with a thorough understanding of the factors that contribute to the motor behavior characteristics of children with developmental disabilities. Application of this knowledge to designing and implementing quality pediatric motor development and physical activity programs will be emphasized. A research-to-practice model will be employed. Students will learn how to assess the current level of movement skill development. **FALL / WINTER. Instructor(s): D. Ulrich**, **MacDonald**

KINESLGY 429/MOVESCI 429. Laboratory Rotation in Motor Control (1-3). *Graduate status; MOVESCI 320; permission of instructor.* Students work in a professor's laboratory to learn research methods and participate in the scientific process. May be taken twice. **FALL/WINTER/SPRING/SUMMER**. **Instructor(s): Brown, Seidler, B. Ulrich, D. Ulrich**

KINESLGY 435/MOVESCI 435. Biomechanics of Human Locomotion (3). *Graduate status; MOVESCI 330 or permission of instructor.* The focus of the course is on understanding how humans walk and run. Topics will include kinematics, kinetics, neuromuscular activation patterns, energetics, and musculotendon mechanics. This course is taught in a Problem-Based Learning format, requiring students to integrate knowledge of muscle physiology, neuroscience, and biomechanics to analyze normal and pathologic human locomotion. Specific projects that students may work on include clinical gait analysis, lower limb prostheses, legged robots, and human exoskeletons. **FALL, AS ARRANGED**. **Instructor(s): Ferris**

KINESLGY 439/MOVESCI 439. Laboratory Rotation in Biomechanics (1-3). *Graduate status; MOVESCI 330; permission of instructor.* Students work in a professor's laboratory to learn research methods and participate in the scientific process. May be taken twice. **FALL/WINTER/SPRING/SUMMER. Instructor(s): Ferris, Gross, McLean, Palmer, Palmieri-Smith**

KINESLGY 441/MOVESCI 441. Exercise and Human Biology (3). *Graduate status; MOVESCI 340 or permission of instructor.* Emphasizes an integrative view of exercise physiology that includes discussion of the neuroendocrine control mechanisms in homeostatic functions and in the adaptive responses of an organism to the challenge of exercise. **FALL OR WINTER, AS ARRANGED. Instructor(s): Borer**

KINESLGY 442/MOVESCI 442. Hormones and Exercise (3). *Graduate status; MOVESCI 340 or permission of instructor.* Review of the mechanisms of hormone release and hormone action; examination of the effects of different types of acute exercise (high resistance, intermittent, endurance), and of the adaptation to habitual exercise on release of endocrine paracrine, and autocrine humoral agents and the functional significance of such release. **FALL OR WINTER, AS ARRANGED. Instructor(s): Borer**

KINESLGY 443/MOVESCI 443. Human Movement and Aging: Hormones and Nutrition (3). *Graduate status; MOVESCI 340 or permission of instructor.* This course will address the interactions between nutrition, hormones, physical activity, and aging. The major themes of the course are the involvement of endocrine changes in disabilities associated with aging, contribution of sedentary lifestyle, and inappropriate food intake to the development of these disabilities, and the extent to which exercise can reverse them. In addition, the course will examine the role of hormones in psychological and mental well-being and the capacity of exercise to facilitate these endocrine changes. **FALL OR WINTER, AS ARRANGED. Instructor(s): Borer**

KINESLGY 444/PHYSED 444/EDUC 444. Methods of Teaching Physical Education 6-12 (4). *Graduate status; two of the following: PHYSED 336, PHYSED 350, PHYSED 353, PHYSED 354.* Concurrent enrollment in EDUC 307 is required. Studies the specific foundation of teaching methods, content, organization, and evaluation of physical education programs in schools. **WINTER TERM ONLY. Instructor(s): Van Volkinburg**

KINESLGY 449/MOVESCI 449. Laboratory Rotation in Exercise Physiology (1-3). *Graduate status; MOVESCI 340; permission of instructor.* Students work in a professor's laboratory to learn research methods and participate in the scientific process. May be taken twice. **FALL/WINTER/SPRING/SUMMER**. **Instructor(s): Bodary, Borer, Cartee, Horowitz, Katch**

KINESLGY 471/MOVESCI 471. Physical Activity, Health and Disease (3). *Graduate status; MOVESCI 340 or permission of instructor.* Students examine current social trends and policies related to the role exercise plays in maintaining health and wellness. Covers cardiovascular disease, lower back pain, obesity and weight control, muscular strength and endurance, mental health and stress, aging, longevity and quality of life. **FALL OR WINTER, AS ARRANGED**. **Instructor(s): Borer**

KINESLGY 473/PHYSED 473. School Health Programs (3). *Graduate status*. This course provides a comprehensive working knowledge of support services and programs available for the child and coordinated through the school. Three major components of school health programs are examined: school health services, school health instruction, and the school environment. **WINTER ONLY**. **Instructor(s): Winkelseth**

KINESLGY 474/MOVESCI 474. Worksite Wellness (3). *Graduate status; MOVESCI 340 or permission of instructor.* Explores the concept of health behaviors and the prospective view of health risk and costs. Students will see how physical activity is integrated into a healthy lifestyle and how that benefits individuals, organizations and society. Examines strategies for changing employee health behaviors and worksite cultural norms, as well as implementation, marketing, cost-effectiveness and cost-benefit analysis of worksite wellness programs. **FALL OR WINTER, AS ARRANGED. Instructor(s): Herman**

KINESLGY 475/PHYSED 475. HIV/AIDS, Other Communicable Diseases, and the Immune System (3). *Graduate status*. This course will provide students with the basic information on: HIV/AIDS transmission and prevention; common communicable diseases including signs, systems and prevention; the immune system and its response to infection. **FALL ONLY. Instructor(s): Winkelseth**

KINESLGY 500. Topical Seminar (1-3). *Graduate status; permission of instructor*. New courses in development can be introduced provisionally into the curriculum under this number. The current course description, if applicable, is available from the program chair. **AS ARRANGED**. **Instructor(s): STAFF**

KINESLGY 503. Legal Aspects of Sport (3). *Graduate status.* This is a comprehensive review of legal aspects affecting sport, recreation, and fitness industries. The range of review includes civil procedure; contracts: employment, leases, waivers; tort liability for coaches, administrators, employees, and independent contractors; 14th Amendment Due Process and Equal Protection; product liability; and statutory regulation including Title VII, Title IX, ADA, Anti-Trust, and IRS code. **WINTER TERM ONLY**. **Instructor(s): Pollick**

KINESLGY 505. Disability Studies (1-3). *Graduate status.* An interdisciplinary approach to disability studies, including focus on the arts and humanities, natural and social sciences, and professional schools. Some topics include history and culture representation of disability, advocacy, health, rehabilitation, built environment, independent living, public policy. Team taught with visiting speakers. Accessible classroom with real-time captioning. **AS ARRANGED. Instructor(s): STAFF**

KINESLGY 506. Managing a Professional Sport Franchise (2). *Graduate standing*. In an effort to provide students with the conceptual and pragmatic background necessary to understand the various functional areas of a professional sport franchise, the course will address the following topics: the evolution and state of professional sports; different types of ownership; the structure and operations of front offices; team economics and decision-making; relationships among leagues, teams players, and unions; player salaries and collective bargaining agreements; corporate marketing and sponsorship; ticket sales and branding; public relations and communications; broadcast agreements; the staging of professional sports events. **WINTER TERM ONLY. Instructor(s): STAFF**

KINESLGY 509. Financial Management for the Sport Industry (3). *Graduate status*. This course is designed to provide graduate students who have never had a course in finance with a general understanding of the fundamental principles of financial management and the manner in which these principles are applied to organizations in the private corporate sector as well as the not-for-profit sector. Course material will be focused on the financial operations of organizations in the sport industry. **FALL OR WINTER, AS ARRANGED. Instructor(s): Winfree**

KINESLGY 510. Experimental Courses in Biomechanics (1-3). *Graduate standing.* Graduate-level Biomechanics courses in development are assigned this number. Current titles are listed in the Time Schedule. **FALL OR WINTER, AS ARRANGED. Instructor(s): STAFF**

KINESLGY 511. Experimental Courses in Exercise Physiology (1-3). *Graduate standing.* Graduate-level Exercise Physiology courses in development are assigned this number. Current titles are listed in the Time Schedule. **FALL OR WINTER, AS ARRANGED. Instructor(s): Cartee**

KINESLGY 512. Experimental Courses in Motor Control (3). *Graduate standing.* Graduate-level Motor Control courses in development are assigned this number. Current titles are listed in the Time Schedule. **FALL OR WINTER, AS ARRANGED. Instructor(s): Seidler**

KINESLGY 513. Experimental Courses in Sport Management (1-3). *Graduate standing*. Graduate-level Sport Management courses in development are assigned this number. Current titles are listed in the Time Schedule. **AS ARRANGED**.

Fall 2009 offering:

Sec 001: **Sport Economics (3). Instructor(s): Fort**

KINESLGY 514. Strategic Management in Sport (3). *Graduate standing***.** This course addresses issues to consider, and approaches to use, in determining: (a) the strategic direction of sport organizations and (b) how such strategic directions can be most effectively implemented and managed. To make these decisions, managers must accurately assess and take into account (1)

threats and opportunities in the organization's environment, (2) the organization's strengths and weaknesses, and (3) the values of top management. **FALL TERM ONLY. Instructor(s): Staff**

KINESLGY 519. Sport Management in Depth (2). *Graduate status and completion of three SM Masters core courses.* The course will allow students in the Sport Management Masters Program to develop expertise in a particular area (or sub-area) of sport management (e.g., marketing, sponsorship, legal issues, ethics, finance, strategy of sport, strategic alliances, facilities management, diversity). This program component will be carried out on an individual basis by the student under the direction of a three-person committee: one SM faculty member, a University of Michigan faculty member who is not in SM, and a practicing manager. **AS ARRANGED**. **Instructor(s): STAFF**

KINESLGY 520. Graduate Seminar in Motor Control (3). *Graduate status, but seniors with outstanding academic record may be admitted; MOVESCI 320; permission of instructor.* Focuses on current issues in movement control from either a neurophysiological or behavioral viewpoint. Students will present assigned readings and will write a paper on an approved topic. **FALL OR WINTER, AS ARRANGED. Instructor(s): Brown**

KINESLGY 530. Graduate Seminar in Biomechanics (3-6). *Graduate status, but seniors with outstanding academic record may be admitted; MOVESCI 330; permission of instructor.* Focuses on current theoretical and practical issues in the biomechanics of movement. Students will present assigned readings and will write a paper on an approved topic. **FALL OR WINTER, AS ARRANGED**. **Instructor(s): Gross**

KINESLGY 532. Managing Human Resources and Organizational Behavior in the Sport Industry (3). This course examines through critical readings, analysis, assignments and class discussions human resource management and organization behavior dynamics and practices and their application to the business of sport. It deals with macro issue such as structure, centralization/decentralization, and culture, and how these issues impact an individual's functioning within an organization. The course also addresses micro behavioral science concepts such as motivation, conflict, leadership, decision-making, group dynamics, power, control, and communication. **FALL OR WINTER, AS ARRANGED. Instructor(s): Babiak**

KINESLGY 533/BME 533. Neuromechanics (3). *Graduate standing.* This course focuses on interaction of the nervous and musculoskeletal systems during human and animal movement with a focus on basic biological and engineering principles. Topics will include neuromechanical control of movement, neurorehabilitation, biorobotics, and computer simulations of neuromechanical systems. **FALL, AS ARRANGED**. **Instructor(s): Ferris**

KINESLGY 540. Advanced Exercise Physiology (3). *Graduate status, but seniors with an outstanding academic record may be admitted; MOVESCI 340, or permission of instructor.* Physiological principles of exercise for students who already have a strong background in exercise physiology. Topics include: regulation of energy metabolism, cardiovascular physiology, neuromuscular and neuroendocrine systems, skeletal muscle, exercise training, environmental influences, nutrition, weight control, and the impact of exercise on health and disease. **FALL TERM ONLY**. **Instructor(s): Horowitz**

KINESLGY 542. Exercise and Nutrition (3). *Graduate status; MOVESCI 340; EIHLTH 630 or permission of instructor.* Biochemical and physiological processes of fuel mobilization and storage in response to exercise and the modification of those processes by nutritional variables. **FALL OR WINTER, AS ARRANGED. Instructor(s): Borer**

KINESLGY 545. Metabolic Responses to Exercise (3). *Graduate standing*; *MOVESCI 340 or equivalent.* This course focuses on the influence of acute and chronic exercise on energy

metabolism. Topics include mechanisms regulating carbohydrate, lipid and protein metabolism; adaptations with exercise training; insulin signaling & action; the relationship between metabolism and fatigue. The format emphasizes class discussion. Students will present on a relevant topic chosen in consultation with the instructor. **FALL OR WINTER, AS ARRANGED. Instructor(s): Cartee**

KINESLGY 550. Marketing Management for the Sport Industry (3). *Graduate status.* This course applies the fundamental concepts in marketing management to managerial decision making in the sport industry. Included in the course are the following: (1) customer orientation to marketing, (2) consumer (or fan) behavior analysis, (3) market segmentation strategies, (4) market research methods, (5) brand management strategies, (6) marketing mix strategies, (7) the development of a strategic marketing plan. **FALL TERM ONLY. Instructor(s): Cornwell**

KINESLGY 551. Theory of Sport and Consumer Behavior (3). *Graduate status*. Focuses on analyzing the consumption behavior of six important consumer groups: the participant, the spectator, the volunteer, the advertiser, the sponsor, and the affinity consumer. In this course we study the major theories that help us understand the consumption behavior of each group. **AS ARRANGED. Instructor(s): STAFF**

KINESLGY 572. Fitness Evaluation and Exercise Prescription (3). *Graduate status; MOVESCI 340 or permission of instructor.* Study and practice of concepts and techniques for evaluating physical fitness. Topics include health and medical histories, liability concerns, blood pressure, graded exercise stress testing, ECG recording and basic interpretation, strength assessment, body composition analysis, pulmonary function tests, CHD risk-factor analysis and health risk appraisal. Lab results and case studies are used to practice writing exercise prescriptions following existing standards of practice. **FALL OR WINTER, AS ARRANGED. Instructor(s): STAFF**

KINESLGY 600. Graduate Seminar in Movement Science (1). *Graduate status.* Graduate students give presentations on their own research related to movement science. The emphasis is on communication across movement science disciplines (i.e. biomechanics, exercise physiology, and motor control) and presentation skills. Can be repeated for credit. **WINTER TERM ONLY**. **Instructor(s): STAFF**

KINESLGY 606. Seminar: Selected Topics in Kinesiology (2). *Graduate status.* Includes advanced reading and seminar discussion of research on selected topics in exercise physiology, motor control, biomechanics or sports management and communication. May be repeated for a total of 6 credit hours. **FALL OR WINTER, AS ARRANGED. Instructor(s): STAFF**

KINESLGY 615. Philosophy of Science and Research in Kinesiology (3). *Graduate status.* Topics include the nature of scientific inquiry, theories of knowledge acquisition; empirical vs. theoretical research; basic vs. applied research; induction and deduction; doubts and alternatives; objectivity of science; facts, laws and theories; pseudo-science; causation and mechanism; formulation of problems, research design and use of statistics. **WINTER TERM ONLY. Instructor(s): Watkins**

KINESLGY 616. Professional Skills for Research Scientists (3). This course covers the professional skills necessary to be successful as a research scientist. Specific content will include writing and reviewing grant applications, writing and reviewing journal manuscripts, giving research presentations, applying for jobs, and assessing careers in and out of academia. Course grade will be based on several assignments such as making a research presentation, writing a grant proposal, reviewing a journal manuscript, and writing an application for faculty position. **WINTER TERM ONLY, AS ARRANGED. Instructor(s): Ferris**

KINESLGY 619. Thesis Research (1-6). *Graduate status.* The thesis experience allows masters students to design and conduct a research study, analyze the data, and write a publication-quality

report on the findings and implications of the research. **FALL/WINTER/SPRING/SUMMER. Instructor(s): STAFF**

KINESLGY 640. Experiments in Human Exercise Physiology (3). *Graduate status; MOVESCI 340 or permission of instructor.* Students review classic studies in energy metabolism, body mass regulation, exercise training, respiratory and circulatory mechanisms in exercise physiology. **FALL OR WINTER, AS ARRANGED. Instructor(s): Katch**

KINESLGY 680. Practicum in Kinesiology (1-6). *Graduate status.* An opportunity for concentrated graduate study in certain phases of Kinesiology and closely allied areas. Typically provides a review of current research, and analysis of new developments and trends. Uses cooperative approach in which authorities from related fields will cover the operating phases of their work. **FALL/WINTER/SPRING/SUMMER. Instructor(s): STAFF**

KINESLGY 682. Independent Reading in Kinesiology (1-2). *Graduate status; permission of instructor.* Advanced reading on topics in Kinesiology under faculty direction. **FALL/WINTER/SPRING/SUMMER. Instructor(s): STAFF**

KINESLGY 684. Independent Research in Kinesiology (1-6). *Graduate status; permission of instructor.* Advanced basic and applied research under faculty guidance. **FALL/WINTER/SPRING/SUMMER. Instructor(s): STAFF**

KINESLGY 685. Research Rotation in Kinesiology (3-6). *Graduate status; permission of instructor.* One research rotation is required of each Ph.D. student in Kinesiology. The rotation can be taken in or outside of Kinesiology but not with the student's advisor. The rotation will be conducted in 1 or 2 semesters. The minimum expectation is that the student will complete a project that contributes to the research of the supervisor, and culminates in a written document. **FALL/WINTER/SPRING/SUMMER. Instructor(s): STAFF**

KINESLGY 686. Internship in Kinesiology (1-6). *Graduate status; permission of instructor.* Field experiences in activities related to the academic discipline of Kinesiology. **FALL/WINTER/SPRING/SUMMER. Instructor(s): STAFF**

KINESLGY 990. Dissertation, Pre-Candidacy (1-8). *Graduate status; permission of instructor.* **FALL/WINTER/SPRING/SUMMER. Instructor(s): STAFF**

KINESLGY 995. Dissertation, Candidacy (8 full terms; 4 half terms). *Graduate status; permission of instructor*. **SEE FACULTY ADVISOR. Instructor(s): STAFF**