

Kinesiology Curriculum Committee Report: Comparative analysis of the MS Program in Kinesiology at TCU.

Purpose: The purpose of this report is to justify the CIP code redesignation to a STEM-recognized CIP code for the KINE MS in Kinesiology.

General overview: The Department of Kinesiology at Texas Christian University is requesting approval to reclassify our Master's (MS) Degree in Kinesiology from the current CIP code of 31.0505 "Exercise Physiology and Kinesiology" (positioned in CIP Series 31: Parks, Recreation, Leisure, Fitness, and Kinesiology) to 26.0908 "Exercise Physiology and Kinesiology" (positioned in CIP Series 26: Biological and Biomedical Sciences). The rationale for this requested change is to more accurately reflect the curriculum that we provide for our students to meet the experiences that they seek out and complete while earning their MS in Kinesiology degree. Furthermore, it most accurately reflects the typical path that these students follow upon completion of this degree.

This requested change in the CIP code better reflects the academic and research approaches that are offered to the students in this degree program. We believe this change will also position our program to be more responsive to the career interests of our students and their future careers. Furthermore, these approaches and program mission are also a more accurate reflection on the mission of the 26.0908 CIP code which emphasizes "*the scientific study of the physiological processes involved in physical or motor activity, including sensorimotor interactions, response mechanisms, and the effects of injury, disease, and disability*", and "*physiological responses (respiration, blood flow, endocrine secretions, and others); fatigue and exhaustion; muscle and body training; physiology of specific exercises and activities; physiology of injury; and the effects of disabilities and disease*". Below we provide the Kinesiology MS program description, its course requirements, and compare those to other Kinesiology programs within Texas that have the 26.0908 CIP designation.

Texas Christian University Master of Science in Kinesiology:

The mission of the graduate program in kinesiology is to provide students the opportunity to gain an in-depth understanding of the theoretical basis of human movement. Students are able to specialize in one of the sub-disciplines within kinesiology; however, the departmental core curriculum also gives students a cross-disciplinary exposure to the study of human movement. Along with classroom studies, involvement in original laboratory research constitutes a major means by which students gain a broad understanding of their specialty area. At the completion of the master's degree students should be able to provide strategies for solving both practical problems and research questions within the disciplines; and integrate movement-based principles into a variety of activities taking place in laboratory, educational, clinical and athletic settings. Prerequisites include a Bachelor of Science or Bachelor of Arts degree with a 24-hour concentration in kinesiology or its equivalent from an accredited college or university.

Requirements: The MS program requires a total of 36 credit hours for completion. The core coursework that all students complete are below.

Academic core coursework:

- KINE 60103 – Research Methods in Kinesiology: "Emphasis is on the design and analysis of research projects and the writing of research papers."

- KINE 60213 – Advanced Biomechanics: *“Investigation of mechanical principles primary to understanding human movement performance. Special emphasis on application of mechanics to the analysis of human performance.”*
- KINE 60423 – Advanced Motor Behavior: *“An in-depth study of the mechanisms and processes involved in the control of human motor activity. Focus on contemporary issues of motor control.”*
- KINE 60613 – Physiology of Exercise: *“Study of physiological responses and adaptations in physical activity germane to selected areas of physical education that are beyond the introductory level.”*
- KINE 70970 – Statistics: *“This course is designed to provide students w/ knowledge & experience w/ statistics & the scientific method. Frequency distributions, descriptive statistics for summarizing measures of central tendency & variability, measures of association, variance, statistics for testing hypotheses, & statistics used to evaluate validity & reliability will be emphasized.”*
- KINE 70990 – Thesis 1 & 2: *Students complete a MS thesis research project under the supervision of a faculty mentor.*

Comparative analysis: According to the Texas Higher Education Coordinating Board there are six different MS degree awarding programs across five different institutions in the state of Texas that fall under the 26.0908 CIP Code ([found here](#)). These institutions are listed below along with a brief description of their MS program and a description of their core courses that are comparable to those offered in the MS in Kinesiology at TCU.

1 & 2) Dallas Baptist University: Offers two different Master’s Degrees: 1) a Master’s of Science in Kinesiology which is a 36-credit hour program. And 2) a Master’s of Education in Kinesiology which is a 36-credit hour non-thesis program.

- KINES 5301 – Exercise Physiology: *“The course is to provide a focused and applied approach in exercise physiology and sport/fitness training, conditioning, and sport medicine. The course will provide an in-depth review of the scientific and physiological components of a training program. The primary focus will be on training factors and how various conditions and situations affect exercise performance.”*
- KINES 5303 – Mechanical Analysis of Motor Skills: *“This course will provide a focused and applied approach to the mechanical analysis of motor skills. The primary focus will be concentrated on the terminology and applied principles of biomechanics related to sport techniques and training principles. This course will also provide an in-depth study of the physical body in motion”.*
- KINES 5321 – Internship: *“This course provides students with a practical experience in a kinesiology/sport-related area of the student’s choosing in a school, college or university, business, or industry. Specific assignment is based on student need and interest. The course requires a report with reflections, assignments, and responsibilities as well as an immediate supervisor’s evaluation”.*
- KINES 6020 - Culminating Experience: *“This course requires the student to synthesize and integrate knowledge acquired in their coursework and apply it in an experience that approximates an aspect they will encounter as a professional in the field of Kinesiology. The Culminating Experience will demonstrate the student’s mastery of researching an approved topic and their proficiency in utilizing technology and oral presentation skills in delivering the topic to the Kinesiology Preparation Board. The student will also present to the board a self-evaluation of their strengths and improvement needs as well as their short-term and long-term career goals. The student will also demonstrate to the board that they have developed an understanding of service-learning and will reflect on how their experience*

enhanced their learning and fostered their civic responsibility. The student must register for KNES 6020 in the semester in which they wish to graduate”.

3) *Midwestern State University*: Offers a Master’s of Science in Exercise Physiology. This program offers a 30-credit hour thesis option; and a 36-credit hour non-thesis option. Relevant courses for both programs are listed below.

- EXPH 5003 – Research and Design: *“Introductory principles of scientific inquiry, research methods applicable to the field, evaluation of published research, and procedures for developing a research design”.*
- EXPH 5013 – Applied Research Statistics: *“Methods of acquisition, analysis, and interpretation of data most often encountered in sport and exercise science will be included. Emphasis will be placed on descriptive methods, statistical methods, and computer applications”.*
- EXPH 5983 – Thesis: Students complete a MS thesis research project under the supervision of a faculty mentor.
- EXPH 5023 – Advanced Exercise Physiology and Assessment: *“The course develops a comprehensive understanding of exercise physiology and provides practical experience evaluating equipment and techniques used in the exercise science laboratory and clinic. Emphasis is on Instrumentation used in the analysis and measurement of muscular, respiratory, cardiovascular, and nervous system structure and function. In addition, the course provides sections of various biochemical and physiological systems and how they respond to exercise and chronic training. Special reference will be made to various types of sports as well as clinical tests and applications”.*
- EXPH 5033 – Clinical Exercise Physiology: Chronic Disease and Prevention: *“Presentation of scientific techniques utilized by clinical exercise physiologists to assess fitness in healthy and disease populations. This course will refine clinical competencies needed to safely administer tests to assess health related components of fitness”.*
- EXPH 5093 – Molecular and Cellular Exercise Physiology: *“An in-depth exploration of cellular and molecular components specific to exercise and the human body. Topics include the following: genes and exercise phenotypes, proteins and exercise, inter- and intracellular signaling; energy turnover and substrate utilization; cellular responses to environmental stress”.*

4) *Texas A&M University-Corpus Christi*: Offers a Master’s of Science in Kinesiology. This program offers 3 options: 1) Non-Thesis Graduate Project; 2) Non-Thesis Comprehensive Examination; 3) Thesis Option. Relevant courses for each program are listed below.

- KINE 5307 – Research Design in Kinesiology: *“The application of fundamental research methods to the design and development of a research proposal in kinesiology”.*
- KINE 5311 – Statistics in Kinesiology: *“A study of basic statistical concepts and their application to research problems in kinesiology. Topics include issues related to descriptive and inferential statistics”.*
- KINE 5312 – Sport Physiology: *“This course expands basic undergraduate exercise physiology principles and focuses on the role of exercise physiology in sports performance, applied and research settings”.*

- KINE 5327 – Sport Biomechanics: *“This course provides an exploration of movement kinetics and kinematics through the framework of sports, physical activity, and associated injury mechanisms. Further emphases will be on identifying viable research questions and appropriate methods (including instrumentation) to pursue those questions”*.
- KINE 5338 – Motor Development in Sport: *“This course addresses the theory and application of human motor development as it relates to the acquisition of motor skills, with a focus on sport performance. The course emphasizes how professionals in the field of sport science should utilize this understanding to serve various client populations throughout the lifespan”*.
- KINE 5394 – Professional Field Experience: *“A graduate-level field-based experience to provide the student the opportunity to apply knowledge and theory related to exercise and sport science”*.
- KINE 5397 – Graduate Research Project in Kinesiology: *“The research project is an alternative to the thesis and three semester hours of credit. The project should be completed in one semester of work with the possibility of more time depending upon the student's topic and design. This is an involved process and the final product includes: 1) Journal Abstract; 2) Journal Manuscript (choice of journal is decided by project chair); 3) Poster Presentation; and 4) Power Point Presentation (Defense)”*.
- KINE 5698 – Thesis: *“Students are required to successfully complete a thesis under the direction and supervision of their thesis chair and committee members. The thesis will require a minimum of two semesters of work and possibly more depending upon their topic and design, thus students will be allowed to register for three hours each semester. The thesis option is designed for students that want to gain extensive experience in research and/or greater knowledge about a specific topic area. It is also designed for those that anticipate more advanced research (e.g., Ph.D.). Upon completion of their work there is a thesis defense. The final product includes: 1) Journal Abstract; 2) Journal Manuscript (choice of journal is decided by thesis chair); 3) Poster Presentation; and 4) Power Point Presentation (Defense)”*.

5) University of Houston-Clear Lake: Offers a Master’s of Science Degree in Exercise and Health Sciences. Relevant courses are listed below.

- EXHS 5131 – Applied Exercise Physiology: Neuromuscular: *“Neuromuscular function: lecture, discussion and lab experience dealing with the impact of acute and chronic exercise on the neuromuscular and endocrine systems. Emphasis upon physiologic responses to various strength training procedures protocols”*.
- EXHS 5132 – Applied Exercise Physiology: Cardiopulmonary: *“Cardiopulmonary function: attention is focused on cardiopulmonary adaptations to acute exercise as well as adaptations associated with regular exercise training. Emphasis on the physiologic responses to metabolic training procedures”*.
- EXHS 5138 – Exercise in Chronic Disease: Musculoskeletal and Neurologic: *“Exploration of exercise as a preventative, curative and rehabilitative modality in individuals with or at risk for chronic musculoskeletal and neurologic diseases and long-term injuries”*.
- EXHS 5335 – Exercise in Chronic Disease: Cardiopulmonary and Metabolic: *“Exploration of exercise as a preventative, curative and rehabilitative modality in individuals with or at risk for chronic musculoskeletal and neurologic diseases and long-term injuries”*.
- EXHS 6033 – Laboratory Techniques and Research Design: *“Concepts and methodology related to performing exercise science research. Examination of the various statistical methods and testing procedures used in exercise science research and practice”*.
- EXHS 6035 – Biostatistics 1: *“Overview of the tools for collection, analysis and presentation of data in all areas of public health and biomedical sciences. Topics covered include variable types, the R environment, graphing, assumptions and correlation”*.

- EXHS 6036 – Biomechanics of Sport and Exercise: “Investigation of the kinematics and kinetics of human movement and the way the laws of physics impact sport and exercise. Particular emphasis is placed on laboratory and field measurement techniques used to quantify and evaluate human performance”.
- EXHS 6038 – Biostatistics 2: “Overview of the tools for collection, analysis and presentation of data in all areas of public health and biomedical sciences. Topics covered include linear and logical regression, t-tests, ANOVA and chi-square”.
- EXHS 6739 – Graduate Internship: “Minimum of two days a week in an approved setting. Written report required”.
- EXHS 6939 – Master’s Thesis Research: “Approval of adviser, thesis director and department chair required”.

6) University of Texas – Arlington: Offers a Master’s of Science Degree in Exercise Science. Relevant courses are listed below.

- KINE 5300 - Research Methods: This course is an overview of concepts and procedures necessary for designing, conducting, and analyzing research in Kinesiology from multiple research paradigms. The course will focus on the steps involved in the administration of a research project, including literature review, design, data collection and analysis.
- KINE 5305 – Applied Statistical Principles in Kinesiology or KINE 5376 – Introduction to Biostatistics: These courses will introduce students to analysis skills applied in the exercise physiology / public health sciences. Students will learn how to apply descriptive statistics, t-tests, ANOVA, correlation, multiple regression, and non-parametric statistics to exercise physiology and public health problems.
- KINE 5320 – Advanced Physiology of Exercise: Key course content includes exercise metabolism, skeletal muscle structure and mechanisms of contraction, neuromuscular control of movement, function and control of the cardiovascular system, pulmonary exercise physiology, immune system function, exercise endocrinology, aerobic and anaerobic adaptations to exercise training, and the effects of exercise in altered environments. Course content is also heavily focused on the impact of Exercise in physiological function and health and disease.
- KINE 5323 – Motor Control and Learning: This course advances on fundamental concepts of motor behavior and performance combining theoretical principles to a variety of realistic contexts to provide the basis of skilled behavior. Contemporary research in human motor behavior models is used to identify effective solutions to practical problems and to spark ideas for optimizing development, learning, and control of motor skills.
- KINE 5350 – Applied Biomechanics: Application of Newtonian mechanics to human movement analysis. Biomechanical models using three-dimensional video and force plate data will be used to analyze human movement. In addition, content will related this movement analysis to various conditions including aging and various neuromuscular conditions.
- KINE 5698 – Thesis: Students complete a MS thesis research project under the supervision of a faculty mentor.

