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The Exercise Science Department serves the Pacific Union College community by providing opportunities for career development in sports professions, for instruction, and for participation.

The department has the following objectives:
• to give thorough instruction in the requirements for participation and leadership in sports activities,
• to develop a knowledge and understanding of health and safety concepts,
• to offer a wide variety of suitable activities, in and out of the classroom, in an environment that supports Christian values,
• to encourage each individual to achieve a high level of total fitness and neuromuscular coordination supporting a wholesome lifestyle, and
• to encourage daily vigorous exercise for everyone in all stages of life.

The Physical Education degree with emphasis in Teacher Education is designed for students wishing to become sports teachers. The Exercise Science degree is designed for the student who either seeks to enter medical school or advance into athletic training. This program recommends the required cognate courses for a pre-professional program and has the required courses for entering a sport medicine graduate program in athletic training.

Major in Physical Education with Teacher Education Emphasis, B.S.
A minimum of 84 hours (44 upper-division hours)

▶ Required Core Courses (68 hours):
ESAC 368 Water Safety Instructor 2
ESAC 370 Lifeguard Training 2
ESTH 166 Historical Foundations of Physical Education 2
ESTH 170 Care and Prevention of Athletic Injuries 2
ESTH 181 Basic Movement 2
ESTH 183 Theory and Technique of Track and Field 2
ESTH 260 Theory and Technique of Football 2
ESTH 261 Theory and Technique of Volleyball 2
ESTH 262 Theory and Technique of Basketball 2
ESTH 263 Theory and Technique of Softball 2
ESTH 264 Theory and Technique of Soccer 2
ESTH 271+2+3 Theory and Technique of Officiating 2+2+1
ESTH 287 Theory and Technique of Individual Sports 2
ESTH 365 Outdoor Experience 3
ESTH 371 Kinesiology 4
ESTH 372 Physiology of Exercise 4
ESTH 373 Introduction to Adapted Physical Activity 3
ESTH 374 Motor Learning 4
ESTH 381 Theory and Technique of Racquet Sports 2
ESTH 384 Theory and Technique of Rhythmic Activities 2
ESTH 461 Coaching I 2
ESTH 470 Management of Physical Education Programs 3
ESTH 471 Evaluation in Physical Education 3
ESTH 476 Physical Education for Children 3
ESTH 483 Theory and Technique of Weight Training and Developmental Physical Education 2
ESTH 490 Ethics in Physical Education 2
HLED 166 Health Education 2

▶ Required Cognate Courses (16 hours)
BIOL 101 Human Anatomy 5
BIOL 102 Human Physiology 5
Exercise Science

COMM 330  Intercultural Communication  3
FDNT 235  Nutrition  3

Students majoring in physical education are expected to choose a minor in consultation with their major advisor.

Major in Exercise Science, B.S.
A minimum of 63 hours (32 upper-division hours):

➢ Required Core Courses (55 hours):
BIOL 101 Human Anatomy 5
BIOL 102 Human Physiology 5
ESAC 370 Lifeguard Training 2
ESTH 166 Historical Foundations 2
ESTH 170 Care and Prevention of Athletic Injuries 2
ESTH 181 BasicMovements 2
ESTH 265 Theory and Technique of Aquatic Fitness 2
ESTH 287 Theory and Technique of Individual Sports 2
ESTH 371 Kinesiology 4
ESTH 372 Physiology of Exercise 4
ESTH 373 Introduction to Adapted Physical Activity 3
ESTH 374 Motor Learning 4
ESTH 378 Fitness Assessment and Exercise Prescription 3
ESTH 381 Theory and Technique of Racquet Sports 2
ESTH 471 Evaluation in Physical Education 3
ESTH 483 Theory and Technique of Weight Training 2
ESTH 490 Ethics in Physical Education 2
ESTH 492 Practicum in Sports Science 3
FDNT 235 Nutrition 3
HLED 166 Health Education 2

➢ Required Core Electives (6 hours):
At least 6 hours from the following: 6
(To be chosen in consultation with the major advisor)
ESTH 183 Theory and Technique of Track and Field (2)
ESTH 260 Theory and Technique of Football (2)
ESTH 261 Theory and Technique of Volleyball (2)
ESTH 262 Theory and Technique of Basketball (2)
ESTH 263 Theory and Technique of Softball (2)
ESTH 264 Theory and Technique of Soccer (2)

Recommended Cognate Courses:
(For students in a pre-professional program)
BIOL 111+112+113 Biological Foundations (5+5+5)
CHEM 111+112+113 General Chemistry (5+5+5)
CHEM 371+372+373 Organic Chemistry (4+4+3)
CHEM 481+482 Biochemistry (4+4)
PHYS 111+112+113 General Physics (4+4+4)
PSYC 121 General Psychology (4)
SOCI 121 Introduction to Sociology (4)

The B.S. degree curriculum (including all recommended cognates) meets or exceeds all undergraduate science requirements for pre-medical and pre-dental students applying to Loma Linda University and many other schools.

Teaching Credential
Students desiring to enter a program of studies leading to a California teaching credential in physical education should take the B.S. degree in Physical Education, Teacher Education Emphasis. Students will need to pass the physical education portion of the CSET exam one quarter prior to doing full-time student teaching. Students are invited to discuss the program with their major advisor in the Exercise Science Department.

Those who plan to teach on the secondary level should consult with the credential analyst in the Education Department and should become acquainted with the specific requirements for admission to and successful completion of the Teacher Education Program as outlined in the section entitled "Education" in this catalog.

Minor in Physical Education
A minimum of 30 hours (12 upper-division hours)

➢ Required Courses (10 hours):
ESTH 166 Historical Foundations of Physical Education 2
ESTH 170 Care and Prevention of Athletic Injuries 2
ESTH 470 Management of Physical Education Programs 3
ESTH 471 Evaluation in Physical Education 3

➢ Required Electives (20 hours):
(To be chosen in consultation with the major advisor)
At least 10 hours from the following: 10
ESTH Theory and Technique courses
At least 10 hours from the following: 10
ESTH Any ESTH courses
Exercise Science Activity–Aerobic

ESAC courses are repeatable for credit. Proper attire is required for participation in activity classes. Additionally, certain classes require specialized equipment. Activity classes meet for a minimum of 2 hours each week. Certain classes involve additional activity time.

Contact the Exercise Science Department for detailed information on the requirements for any particular activity course.

Lower-Division Courses:

ESAC 101A 1 F, W, S
Jogging
For the beginning/intermediate jogger. Instructions pertaining to cardiovascular/muscular fitness, running style, running equipment, and personal running program development.

ESAC 103A 1 F, W, S
Physical Fitness
Introduction to fitness by means of cardiovascular development. Various fitness machines are used to inspire a commitment to cardiovascular fitness that will hopefully extend beyond the duration of this course.

ESAC 105A 1 W, S
Fitness for Women
For female students wanting to get started on an exercise program with some variety. Significant class time is dedicated to aerobic-type workouts. Also includes weight training, kickboxing and cardio moves to music.

ESAC 107A 1 F, S
Swim and Stay Fit
The use of swimming skills to enhance muscular and cardiovascular fitness. Focuses on acquisition of the skills and knowledge needed to maintain and enhance cardiovascular and muscular fitness. Proficiency in swimming strokes required.

ESAC 109A 1 S
Hydro-Aerobics
A low-medium impact conditioning and toning class. Shallow and deep water movements utilizing calisthenics and strengthening exercises are employed to learn how water exercises are a rehabilitation modality for injuries and a method for maintaining fitness.

Upper-Division Courses:

ESAC 304A 1 S
Cycling
Aspects pertaining to the elements of road cycling. Includes safety, riding techniques, bike maintenance, and physical conditioning. This class is not for beginners and requires adequate physical conditioning. Road bike required. (A limited number of bikes are available for student use- please make inquiries to the professor.)

ESAC 338A 1 F
Ultimate Frisbee
This course is designed to teach the fundamental skills and rules of Ultimate Frisbee as well as how to play the game and how to implement basic strategies used in the game. Emphasis placed on skills, rules, and participation in playing the game of Ultimate Frisbee.

Exercise Science Activity

ESAC courses are repeatable for credit. Proper attire is required for participation in activity classes. Additionally, certain classes require specialized equipment. Activity classes meet for a minimum of 2 hours each week. Certain classes involve additional activity time.

Contact the Exercise Science Department for detailed information on the requirements for any particular activity course.

Lower-Division Course:

ESAC 100 1 Arranged
Adaptive Physical Education
Designed to accommodate students with physical limitations. Cardiovascular endurance, muscular strength, muscular endurance and flexibility are employed and adapted to fit the individual needs/abilities of the student. Requires physician’s certification of need. Repeatable for credit.

ESAC 120 1 W
Elementary Basketball
Focuses on the fundamentals of basketball, such as, dribbling, passing, shooting, footwork, and defensive stance. Fundamental strategy for both offensive and defensive play also are covered.

ESAC 123 1 S
Baseball- Men
Introduces students to the basic concepts to enhance the skill levels of baseball activities. Proper techniques to fielding, base running, throwing in addition to hitting a baseball are introduced.
ESAC 124 1 F
Flag Football
Introduces students to the basic skills of flag football, including throwing, catching, kicking, punting, and flag pulling. Also covers a basic knowledge of the rules and game strategies.

ESAC 128 1 F, S
Soccer
Cover the basic elements in the game of soccer, including ball-handling skills, shot making, offensive/defensive alignments and game strategy. The rules, terminology and history of the game also are included. Fall quarter enrollment limited to members of the men’s varsity soccer team. Spring quarter enrollment is open to other students.

ESAC 130 1 S
Softball
Introduces the basic skills of softball, including fielding, throwing, hitting, base running, and pitching. Students should have a glove and proper shoes to participate.

ESAC 132 1 F, W
Elementary Volleyball
Designed to introduce students to the basic skills, rules, and strategies of the game of volleyball. Skills are demonstrated, practiced and then implemented in class games.

ESAC 133 1 F
Mountain Biking
Encompasses aspects pertaining to the elements of mountain bike riding. Topics covered include safety, riding techniques, bike maintenance, and physical conditioning.

ESAC 138 1 F
Elementary Swimming
Introduces the non-swimmer as he or she explores the aquatic environment and develop the skills needed to enjoy time in and around the water. The class is intended for students with little or no swimming skills and who would likely not survive in deep water. Even years.

ESAC 160 1 S
Fencing
Fundamental skills in fencing. Rules, terminology and history of the game also are included.

ESAC 171 1 W
Pickleball
Aspects of pickleball (i.e. ground strokes, serve, baseline volley, drop shot, drop volley, court coverage and more). Rules, terminology and history of the game also are included.

ESAC 174 1 W
Elementary Badminton
Fundamental skills and rules in badminton, along with an introduction to the drop shot and smash and an emphasis on doubles and singles strategy. Conditioning is a part of every class.

ESAC 176 1 F, W, S
Elementary Weight Training
An introductory course designed to help each student improve muscular strength, gain knowledge and understanding of weight training theory and practice, and develop a personalized weight training program.

ESAC 178 1 S
Canoeing
Introduces students to the skills and experiences involved in the world of canoeing at the basic level. Includes time in both still and running water.

ESAC 180 1 F
Elementary Golf
The basic rules and etiquette of golf. Also includes the basic fundamentals of the golf swing. Safety issues are discussed and golf strategy is introduced. Students must pay for range balls and green fees. For current rates, inquire at the ESHN Department.

ESAC 192 1 W
Elementary Skiing/Snowboarding
Covers equipment, basic techniques, and safety rules for on-the-trail and off-the-trail safety. Conditioning and discussion about techniques is a major part of class activity. On hill instruction is offered by Sierra at Tahoe Resort only. Additional fees apply. For current rates, inquire at the ESHN Department.

ESAC 194 1 F, S
Elementary Tennis
Covers the most basic fundamentals in tennis: the basic stance, footwork, forehand/backhand strokes, volley and the serve. After an introduction to singles and doubles strategy and the rules of the game, there is a doubles tournament in class and two singles games played outside of class (at scheduled times).

Upper-Division Courses:

ESAC 358 1 F
Intermediate Swimming
Assists the swimmer as he or she improves swimming skills, including the crawl, breast stroke, back stroke, butterfly, and sidestroke. Also includes basic water safety and rescue skills. The class is intended for students who have already learned beginning-level swimming skills. Even years.
ESAC 368  Water Safety Instructor
2 S
Instructs students to become a teacher of the American Red Cross Learn to Swim Program. Prerequisite: Intermediate level proficiency in the crawl stroke, breast stroke, side stroke & butterfly; basic diving skills from the one meter springboard. Students must pass a skills pre-test before being allowed to continue in class. Recommended prerequisite: Red Cross Level 5. Even years.

ESAC 370  Lifeguard Training
2 S
Meets and exceeds the requirements of the American Red Cross for certification as a Lifeguard. Prerequisite: Proficiency in the crawl stroke and breast stroke. Students must pass American Red Cross Skills Test before being allowed to continue in class. Recommended prerequisite: Red Cross Level 5.

ESAC 374  Intermediate Badminton
1 W
Reviews and enhances fundamental skills, with an emphasis on more technical skills (i.e. the flick serve, drop/push shots and the 1/2 smash). Much of the time is spent in playing games but drill work, conditioning, and self-evaluation testing is a part of the class as well.

ESAC 376  Intermediate Weight Training
1 W
Assists students in developing a weight training program that focuses on one of three areas: body building, sport specific, and rehabilitation of an injury. After determining and executing the training program, the student selects his/her individual workout format based on the workout encyclopedia and the CD-ROM program companion. Odd years.

ESAC 380  Intermediate Golf
1 S
Mechanics and techniques of the full golf swing, pitching, chipping, bunker play and putting. Skills improvement by playing rounds of golf. Also covers basic rules of golf and proper golf etiquette. Students must pass a basic golf skills test at the first day on the range in order to continue enrollment in the class. Additional fees apply. For current rates, inquire at the ESHN Department.

ESAC 392  Intermediate Skiing/Snowboarding
1 W
Covers equipment, basic techniques, and safety rules for on-the-trail and off-the-trail safety when skiing. Conditioning is a major part of class activity as well as discussion about techniques. Additional fees apply. For current rates, inquire at the ESHN Department.

ESAC 394  Intermediate Tennis
1 S
Designed for the intermediate-advanced player to improve skills, game strategies, and learn advanced techniques of tennis. Students must be able to hit consistent forehand and backhand ground strokes as well as serve in the proper court with some force at 50% accuracy.

ESAC 385V  Basketball- Varsity Women
1 W
Enrollment limited to members of the women’s varsity basketball team.

ESAC 336V  Basketball- Varsity Men
1 W
Enrollment limited to members of the men’s varsity basketball team.

ESAC 337V  Soccer- Varsity Men
1 F
Enrollment limited to members of the men’s varsity soccer team.

ESAC 338V  Cross Country- Varsity
1 F
Enrollment limited to members of the varsity cross country team.

Lower-Division Courses:

ESTH 166  Historical Foundations of Physical Education
2 W
History of physical education, health and recreation. Effects of social expectations and world events on views of physical education and sports. An introduction to careers in these and related fields.

ESTH 170  Care and Prevention of Athletic Injuries
2 W
Care and prevention of injuries associated with coaching and teaching sport and game activities in a school setting. Topics include sprains, bleeding, fractures, exposure to heat and cold, seizures, heart attacks, accidental exposure to poisons and chemicals, and other injuries requiring immediate medical attention.
ESTH 181 2 F
Basic Movement
Fundamentals of body movement, posture, conditioning exercises, self-testing activities; selection, evaluation, and organization of social recreational activities. Odd years.

ESTH 183 2 S
Theory and Technique of Track and Field
Practice sessions and drills for developing fundamental skills and special abilities; study of rules and officiating techniques; consideration of practice scheduling and strategy. Odd years.

ESTH 260 2 F
Theory and Technique of Football
Practice in and theory of flag football. Development of fundamental skills of the game; analysis of skills, techniques, team strategy, and rules. Even years.

ESTH 261 2 F
Theory and Technique of Volleyball
Practice in and theory of volleyball. Development of fundamental skills of the game; analysis of skills, techniques, team strategy, and rules. Even years.

ESTH 262 2 W
Theory and Technique of Basketball
Analysis and practice of skills and team play; interpretation of rules; strategy and techniques of teaching. Even years.

ESTH 263 2 S
Theory and Technique of Softball
Practice in and theory of softball. Development of fundamental skills of the game; analysis of skills, techniques, team strategy, rules and officiating procedures. Even years.

ESTH 264 2 S
Theory and Technique of Soccer
Practice and theory of soccer. Development of fundamental skills of the game; analysis of skills, techniques, team strategy and rules. Even years.

ESTH 265 2 F
Theory and Technique of Aquatic Fitness
Emphasis on the theory of how to develop appropriate workout programs in the area of aquatics. Students learn choreography of water exercise programs in aquatic aerobics, swimming fitness, and adaptive water exercise. Students participate in individual fitness performance and develop programs for specific population demographics, specific ages, and those with special needs. Prerequisite: Intermediate-level proficiency in the crawl stroke and breast stroke. Odd years.

ESTH 267 2 F
Theory and Practice of Officiating I, II, III
Theory of and practice in officiating at team sports, interpretation of rules, officiating techniques, examinations, and ratings. Consists of a combination of lectures and practice. Prerequisite: Previous experience in playing football, volleyball, basketball, and softball.

ESTH 287 2 S
Theory and Technique of Individual Sports
Development of fundamental skills and strategies in various individual activities such as handball, golf, racquetball, and archery. Emphasis on teaching techniques, officiating, rules, and organization of materials for school programs. Additional fees apply. For current rates, inquire at the ESHN Department. Odd years.

Upper-Division Courses:

ESTH 365 3 S
Outdoor Experience
Theory and practice in camping, hiking, backpacking, and canoeing techniques. Ecological considerations, equipment and food selection, outdoor cooking, and orienteering. One credit may apply to the Fitness general education requirement. Additional fees apply. For current rates, inquire at the ESHN Department.

ESTH 371 4 F
Kinesiology
A study of joints and muscular structure and their relation to physical exercise. Three lectures and one laboratory per week. Prerequisites: BIOL 101, 102. Odd years.

ESTH 372 4 F
Physiology of Exercise
Physiological effects of muscular exercise, physical conditioning, and training. Significance of these effects for health and for performance in activity programs. Three lectures and one laboratory per week. Prerequisites: BIOL 101, 102. Even years.

ESTH 373 3 S
Introduction to Adapted Physical Activity
Common deviations of posture and feet; functional disturbances and crippling conditions found in school children. Survey of source material needed to plan and conduct individual, developmental, and special courses in physical education in schools. Odd years.
ESTH 374  4 W  
**Motor Learning**  
Physiological and psychological instructional considerations for learning, skill acquisition, and performance as applied to motor skills. Three lectures and one laboratory per week. Prerequisites: BIOL 101, 102, and two lower-division ESTH Theory and Technique courses. Even years.

ESTH 378  3 W  
**Fitness Assessment and Exercise Prescription**  
Introduction to the theoretical and practical aspects of exercise assessment, exercise interpretations, and exercise prescription. Covers principles of exercise prescription with hands-on experiences using various clinical and field methods to evaluate cardiorespiratory fitness, muscular strength and endurance, flexibility and body composition. Prerequisite: ESTH 372. Odd years.

ESTH 381  2 F  
**Theory and Technique of Racquet Sports**  
Analysis of and practice in strokes and tactics; rules, history and skill progression for various levels of instruction. Odd years.

ESTH 384  2 W  
**Theory and Technique of Rhythmic Activities**  
Development of personal and teaching skills for theoretical and practical application of rhythms: the leadership of aerobic exercise, dramatic and creative play, folk rounds, and other activities. Development of skills for personal combative activities and techniques for teaching such skills. Odd years.

ESTH 461  2 W  
**Coaching I**  
Designed to develop skills for coaching athletic teams. Development of philosophies in harmony with Seventh-day Adventist principles concerning athletic events. Skills in team building and strategies. Practical experience included. Prerequisites: At least 3 of the following courses- ESTH 260, 261, 262, 263, 264. Even years.

ESTH 470  3 F  
**Management of Physical Education Programs**  
Relationship of physical education to modern education theory. The organization of physical education activities, organization and classification of pupils; emphasis on the arrangement and construction of equipment and planning of school programs suitable to denominational schools. Odd years.

ESTH 471  3 W  
**Evaluation in Physical Education**  
Scientific testing in physical education: analysis and study of tests, diagnosis of physical efficiency, and physiological reactions to exercise. Evaluation of programs and student achievement through measurement technique. Odd years.

ESTH 476  3 F  
**Physical Education for Children**  
Activity interests of children and appropriate materials for different age levels; selection of materials and methods of presentation. Consists of a combination of lectures and practice. Applies as one course for the Fitness general education requirement.

ESTH 483  2 S  
**Theory and Technique of Weight Training and Developmental Physical Education**  
An analysis of the physiological and biomechanical application of resistant training, cross training and sports nutrition for athletes participating in team and individual sports. Principles of program design, supervision, and technique assessment for pre-season, season and post season development. Prerequisite: ESTH 371. Even years.

ESTH 490  2 W  
**Ethics in Physical Education**  
The power of religion in developing Christian professionals in health, physical education and recreation. Concepts of the way God, man and Spirit relate to one another; development of Christlike leadership qualities in both instructors and students. Even years.

ESTH 492  3 S  
**Practicum in Sports Science**  
Combines classroom work with practical hands-on experience to prepare students to continue their education in the fields of athletic training, personal training, sports physical therapy, or sports medicine. Skills developed in the program are taken from the following areas: anatomy and physiology, athletic injury care, prevention and rehabilitation, physical therapy, fitness programs for individuals and groups, health and wellness, nutrition, and strength training. Should be taken during the student's last year at Pacific Union College before graduation.
ESTH 495  1-3 Arranged
Independent Study
Open by permission of the department chair to advanced students with adequate background and experience. Repeatable to a maximum of 3 credits.

HLED 495  1-3 Arranged
Independent Study
Open by permission of the department chair to advanced students with adequate background and experience. Repeatable to a maximum of 3 credits.

Health Education

Lower-Division Courses:

HLED 162  2 W, S
Fitness for Life
Introduces the philosophy of health, aimed at lasting nutritional and physical conditioning that promotes a high level of well-being. Emphasis on the prevention of heart disease, obesity, and stress. Laboratory evaluation in body composition, blood analysis, stress testing, and the treadmill.

HLED 166  2 F, W
Health Education
Encourages the development of self-awareness and promotes “wellness” as a life-long personal investment. Advocates protection and effective use of human and ecological resources and acquiring skills for individual responsibility. Emphasis on Seventh-day Adventist health principles. Treats substance abuse and nutrition as required for SDA and California teaching credentials.

HLED 169  2 Arranged
Current Health Concerns
Explores the background and cause of common health problems of the adult as well as prevention and treatment. Designed to promote physical vitality and a sense of well-being.