

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

12-60d  
R-11/13/12  
Senate: App-12/4/12 AP-11/27/12

Contact Person(s) Dr. Madeline Paternostro Bayles	Email Address mpbayles@iup.edu
Proposing Department/Unit Health and Physical Education	Phone 357 7835

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

- New Course                       Course Prefix Change                       Course Deletion  
 Course Revision                       Course Number and/or Title Change                       Catalog Description Change

Current course prefix, number and full title: HPED 414 Exercise Electrocardiography

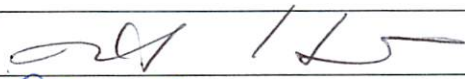


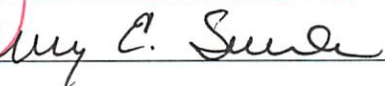

Proposed course prefix, number and full title, if changing:

4. Program Proposals

- Catalog Description Change                       Program Revision                       Program Title Change                       New Track  
 New Degree Program                       New Minor Program                       Liberal Studies Requirement Changes                       Other

Current program name: Physical Education and Sport - Exercise Science Track

Proposed program name, if changing:

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)		9-17-12
Department Chairperson(s)		9-17-12
College Curriculum Committee Chair		10-16-12
College Dean		10/19/12
Director of Liberal Studies (as needed)		
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate		
UWUCC Co-Chairs		11/28/12

Received  
NOV 28 2012  
Liberal Studies

Received  
NOV 16 2012  
Liberal Studies

Received  
OCT 24 2012  
Liberal Studies

## **Part II. Description of Curriculum Change**

### **1. New Syllabus of Record**

#### **HPED 414 Exercise Electrocardiography**

**2 class hours  
1 lab hour  
3 credits  
(2c-11-3cr)**

**Prerequisites:** PESP-EXSC majors and HPED 343 with a grade of C or better  
An introduction to the basic concepts of electrocardiography (ECG), including an understanding of electrophysiology, electrode lead placement, both rhythm strips and 12-lead interpretation. Utilizing electrocardiograms students will be able to recognize normal and abnormal rhythms including ECG abnormalities brought about by exercise. ECG changes resulting from Graded Exercise Testing will also be evaluated.

### **II. Course Outcomes**

Students will be able to:

1. Interpret cardiac electrophysiology.
2. Interpret electrode placement and lead systems for a single monitoring and 12-Lead ECG.
3. Interpret components of the normal resting 12-lead electrocardiogram.
4. Recognize abnormal rhythms including those due to chamber enlargement, conduction abnormalities, myocardial ischemia and patterns of infarction.
5. Perform and interpret ECG changes associated with incremental exercise testing for both normal and those with CAD.

### **III. Course Outline**

#### **A. Basic Electrocardiography and lead placement (6 hrs)**

1. Coronary artery disease
2. Scheme for ECG interpretation
3. Components of the ECG

#### **B. Dysrhythmias (8 hrs)**

1. SA node and atrial arrhythmias
2. Junctional arrhythmias
3. Ventricular arrhythmias

#### **C. Blocks (6 hrs)**

1. Normal electrical conduction
2. 1<sup>st</sup>- 3<sup>rd</sup> degree block

D. Patterns of Myocardial Ischemia, Injury and Infarction (8 hrs)

1. Myocardial Infarction
2. Myocardial Ischemia
3. Myocardial Injury

E. Laboratory (14 hrs)

1. Resting ECG
2. IWORX labs abnormal ECG's
3. Practice graded exercise testing

Final Exam (2 hours)

#### IV. Evaluation Methods

The final grade will be determined as follows:

**35%** Perform and Evaluate 12-Lead ECGs - Students will be required to perform a series of resting and exercise ECG's and provide interpretation.

**10%** Homework Assignments - There will be weekly homework worksheets to practice ECG interpretation.

**35%** Quizzes - There will be a series of quizzes throughout the semester.

**20%** Final Exam - There will be one written final exam.

#### V. Grading Scale

**Grading Scale:** A:  $\geq 90\%$  B: 80-89% C: 70-79% D: 60-69% F:  $< 60\%$

#### VI. Attendance Policy

The course attendance policy will be consistent with the university undergraduate attendance policy included in the undergraduate catalog.

#### VII. Required textbooks, supplemental books and readings

Dunbar, C., & Saul, B. (2009). *ECG Interpretation for the Clinical Exercise Physiologist* Lippincott Williams & Wilkins, 3rd Edition.

Recommended Text & Internet Sites:

Conover, M.S. *Understanding Electrocardiography* 8th Edition, Mosby, St. Louis, MO 2003.

The Alan E. Lindsay ECG Learning Center: <http://medstat.med.utah.edu/kw/ecg>

ECG Library: [www.ecglibrary.com](http://www.ecglibrary.com)

## **IX. Bibliography**

American College of Sports Medicine. (2009). *ACSM Resource manual for guidelines for exercise testing and prescription* (6th ed.). Philadelphia, PA: Lippincott, Williams & Wilkins.

Atwood, S., Stanton, C, & Storey-Davenport, J. (2011). *Introduction to basic dysrhythmias*. (4<sup>th</sup> ed). St. Louis: Mosby.

Dubin D. (2006). *Rapid interpretation of EKGs: An interactive course*. Tampa, FL: Cover Publishing Company.

Ellenbogen, K.A., Kay, G.N., Lau, C., & Wilkoff, B.L. (2007). *Clinical cardiac pacing, defibrillation and resynchronization therapy*. Philadelphia, PA: Saunders-Elsevier Pub.

Labus, D., and Thompson, G. (2011). *ECG Interpretation: An incredibly easy! pocket guide* (5th ed.). Philadelphia: Lippincott/Springhouse Nursing Collection.

Huff J. (2012). *ECG Workout: Exercises in arrhythmia interpretation*. (6th ed.). Philadelphia: JB Lippincott.

Huzar RJ. (2002). *Basic Dysrhythmias: Interpretation and management*, (3<sup>rd</sup> ed). St. Louis: Mosby.

Lip, G.H., and Godtfredsen, J.(2005). *Cardiac arrhythmias*. St. Louis: Mosby.

Thaler, M.S. (2009). *The only EKG book you'll ever need* (6<sup>th</sup> ed.). Philadelphia: Lippincott Williams & Wilkins.

Wagner, G. S. (2007). *Marriott's practical electrocardiography* (11th ed.). Philadelphia: Lippincott Williams & Wilkins.

## **VIII. Special Resource Requirements**

**None required.**

## **2. Summary of Proposed Changes**

Credit hours changed from 2cr to 3cr.

### **Current Description:**

**HPED 414 Exercise Electrocardiography**

**1c-1l-2cr**

### **Proposed Description:**

**HPED 414 Exercise Electrocardiography**

**2c-1l-3cr**

## **3. Justification/Rationale**

We have elected to use 1 credit available from the LS curriculum revision to increase the total number of credit hours from 2 cr to 3 cr. After teaching this course twice, it was apparent that more class time was necessary to cover all topics related to resting ECG's as well as in graded exercise testing. Additionally increasing the credit hours from 2 cr to 3 cr will enable this course to become dual-listed. Competencies in electrocardiography are necessary in both the undergraduate as well as graduate curriculum required to sit for national certification exams in clinical exercise physiology (i.e., ACSM Clinical Exercise Specialist certification, ACSM's Registered Clinical Exercise Physiologist Certification) (see Appendix I).

**APPENDIX I**

**ACSM CERTIFIED HEALTH FITNESS SPECIALIST<sup>SM</sup> JOB TASK ANALYSIS**

The job task analysis is intended to serve as a blueprint of the job of an ACSM Certified Health Fitness Specialist<sup>SM</sup>. As you prepare for the exam, it is important to remember that all examination questions are based on this outline.

**Job Definition**

The ACSM Certified Health Fitness Specialist<sup>SM</sup> (HFS) is a health/fitness professional with a minimum of a Bachelor's degree in exercise science. The HFS performs pre-exercise health risk assessments, conducts physical fitness assessments, interprets results, develops Ex Rx, and applies behavioral and motivational strategies to apparently healthy individuals and individuals with medically controlled diseases and health conditions to support clients in adopting and maintaining healthy lifestyle behaviors. The academic preparation of the HFS also includes fitness management, administration, and supervision. The HFS is typically employed or self-employed in commercial, community, studio, corporate, university, and hospital settings.

**Performance Domains and Associated Job Tasks**

The Job Task Analysis (JTA) for the ACSM Certified Health Fitness Specialist (HFS) describes what the professional does on a day-to-day basis. The JTA is divided into domains and associated tasks performed on the job. The percentages listed below indicate the number of questions representing each domain on the 150-question HFS examination.

Domain III: Exercise Counseling and Behavioral Strategies - 20%

**Domain III: Exercise Counseling and Behavioral Strategies**

**Associated Job Tasks**

A. Optimize adoption and adherence to exercise programs and other healthy behaviors by applying effective communication techniques.

**1) Knowledge of:**

- a. The effective and timely uses of communication modes (e.g., email, telephone, web site, newsletters).
- b. Verbal and non-verbal behaviors that communicate positive reinforcement and encouragement (e.g., eye contact, targeted praise, empathy).

- c. Group leadership techniques for working with participants of all ages.
- d. Active listening techniques.
- e. Learning modes (auditory, visual, and kinesthetic).
- f. Types of feedback (e.g., evaluative, supportive, descriptive).

**2) Skill in:**

- a. Using active listening techniques.
- b. Applying teaching and training techniques to optimize participant training sessions.
- c. Using feedback to optimize participant training sessions.
- d. Applying verbal and non-verbal communications with diverse participant populations.

**B. Optimize adoption of and adherence to exercise programs and other healthy behaviors by applying effective behavioral and motivational strategies.**

**1) Knowledge of:**

- a. Behavior change models and theories (e.g., health belief model, theory of planned behavior, socio-ecological model, Transtheoretical model, social cognitive theory, and cognitive evaluation theory).
- b. The basic principles involved in Motivational Interviewing.
- c. Intervention strategies and stress management techniques.
- d. The stages of motivational readiness (e.g., Transtheoretical model).
- e. Behavioral strategies for enhancing exercise and health behavior change (e.g., reinforcement, S.M.A.R.T. goal setting, social support).
- f. Behavior modification terminology including, but not limited to, self-esteem, self-efficacy, antecedents, cues to action, behavioral beliefs, behavioral intentions, and reinforcing factors.
- g. Behavioral strategies (e.g., exercise, diet, behavioral modification strategies) for weight management.
- h. The role that affect, mood and emotion play in exercise adherence.
- i. Common barriers to exercise initiation and compliance (e.g., time management, injury, fear, lack of knowledge, weather).

- j. Techniques that facilitate motivation (e.g., goal setting, incentive programs, achievement recognition, social support).
- k. The role extrinsic and intrinsic motivation plays in the adoption and maintenance of behavior change.
- l. Relapse prevention strategies and plans of action.
- m. Applying health coaching principles and lifestyle management techniques related to behavior change.
- n. Strategies that increase non-structured physical activity levels (e.g., stair walking, parking farther away, bike to work).

**2) Skill in:**

- a. Explaining the purpose and value of understanding perceived exertion.
- b. Using imagery as a motivational tool.
- c. Evaluating behavioral readiness to optimize exercise adherence.
- d. Applying the theories related to behavior change to diverse populations.
- e. Developing intervention strategies to increase self-efficacy and self-confidence.
- f. Developing reward systems that support and maintain program adherence.
- g. Setting effective behavioral goals.

**C. Provide educational resources to support clients in the adoption and maintenance of healthy lifestyle behaviors.**

**1) Knowledge of:**

- a. The relationship between physical inactivity and common chronic diseases (e.g., Atherosclerosis, type II diabetes, obesity, dyslipidemia, arthritis, low back pain, hypertension).
- b. The dynamic inter-relationship between fitness level, body composition, stress and overall health.
- c. Modifications necessary to promote healthy lifestyle behaviors for diverse populations.



- d. Stress management techniques and relaxation techniques (e.g., progressive relaxation, guided imagery, massage therapy).
- e. The activities of daily living (ADLs) and how they relate to overall health.
- f. In accessing and disseminating scientifically-based, relevant health, exercise, nutrition, and wellness-related resources and information.
- g. Specific, age-appropriate leadership techniques and educational methods to increase client engagement.
- h. Community-based exercise programs that provide social support and structured activities (e.g., walking clubs, intramural sports, golf leagues, cycling clubs).

**2) Skill in:**

- a. Accessing and delivering health, exercise, and wellness-related information.
- b. Educating clients about benefits and risks of exercise and the risks of sedentary behavior.

**D. Provide support within the scope of practice of a Health Fitness Specialist and refer to other health professionals as indicated.**

**1) Knowledge of:**

- a. The side effects of common over-the-counter and prescription drugs that may impact a client's ability to exercise.
- b. Signs and symptoms of mental health states (e.g., anxiety, depression, eating disorders) that may necessitate referral to a medical or mental health professional.
- c. Symptoms and causal factors of test anxiety (i.e., performance, appraisal threat during exercise testing) and how they may affect physiological responses to testing.
- d. Client needs and learning styles that may impact exercise sessions and exercise testing procedures.
- e. Conflict resolution techniques that facilitate communication among exercise cohorts.

**2) Skill in:**

- a. Communicating the need for medical, nutritional, or mental health intervention.

# ACSM CERTIFIED CLINICAL EXERCISE SPECIALIST<sup>SM</sup> JOB TASK ANALYSIS

The job task analysis is intended to serve as a blueprint of the job of an ACSM Certified Clinical Exercise Specialist<sup>SM</sup>. As you prepare for the exam, it is important to remember that all examination questions are based on this outline.

## **Job Definition**

The ACSM Certified Clinical Exercise Specialist<sup>SM</sup> (CES) is an allied health professional with a minimum of a Bachelor's degree in exercise science. The CES works with patients and clients challenged with cardiovascular, pulmonary, and metabolic diseases and disorders, as well as with apparently healthy populations in cooperation with other healthcare professionals to enhance quality of life, manage health risk, and promote lasting health behavior change. The CES conducts pre-participation health screening, maximal and submaximal graded exercise tests, and performs strength, flexibility and body composition tests. The CES develops and administer programs designed to enhance aerobic endurance, cardiovascular function, muscular strength and endurance, balance, and range of motion. The CES educates their clients about testing, exercise program components, and clinical and lifestyle self- are for control of chronic disease and health conditions.

## **Performance Domains and Associated Job Tasks**

The Job Task Analysis (JTA) for the CES describes what the professional does on a day-to-day basis. The JTA is divided into domains and associated tasks performed on the job. he percentages listed below indicate the number of questions representing each domain on the 100-question CES examination.

- Domain IV: Leadership and Counseling - 20%

## **Domain IV: Leadership & Counseling**

### **Associated Job Tasks**

A. Educate the participant about performance and progression of cardiovascular, strength and flexibility exercise programs.

#### **1) Knowledge of:**

- a. physiological responses, signs, and symptoms to exercise associated with different pathologies (i.e., cardiovascular, pulmonary, metabolic).
- b. exercise (as written above) principles (prescription, progression/maintenance and supervision) for apparently healthy participants and participants with cardiovascular, pulmonary, and/or

metabolic diseases.

- c. exercise progression, maintenance and supervision for apparently healthy participants and participants with cardiovascular, pulmonary, and/or metabolic diseases.
- d. tools for measuring clinical exercise tolerance (e.g., heart rate, glucometry, subjective rating scales).
- e. the application and instruction of muscle strength/endurance and flexibility modalities.
- f. exercise modalities and the operation of associated equipment.
- g. proper biomechanical techniques (e.g., gait assessment, resistance training form).
- h. methods to educate participant in proper exercise programming and progression.
- i. the timing of daily activities with exercise (e.g., medications, meals, insulin/ glucose monitoring).
- j. disease-specific strategies and tools to improve exercise tolerance (e.g., breathing techniques, insulin pump use, prophylactic nitroglycerin).
- k. behavioral strategies for improving exercise adoption and maintenance.
- l. barriers to exercise compliance and associated strategies (e.g., physical, psychological, environmental).

**2) Skill in:**

- a. communication of exercise techniques, prescription and progression.
- b. the assessment of participant symptoms, biomechanics and exercise effort.

**B. Provide disease management and risk factor reduction education based on the participant's medical history, needs and goals.**

**1) Knowledge of:**

- a. education program development based on participant's medical history, needs and goals.
- b. methods to educate participant in risk factor reduction.

- c. published national standards on risk factors for cardiovascular, pulmonary and metabolic disease.
- d. risk factor reduction programs and alternative community resources (e.g., dietary counseling/Weight Watchers<sup>®</sup>, smoking cessation, physical therapy/back care).
- e. strategies to improve participant compliance to risk factor reduction.
- f. goal development strategies.
- g. counseling techniques.
- h. validated tools for measurement of psychosocial health status (e.g., SF-36, trait-trait anxiety, Beck depression).
- i. psychological issues associated with acute and chronic illness (e.g., anxiety, depression, social isolation, suicidal ideation).
- j. outcome evaluation methods (e.g., AACVPR outcomes model).

**2) Skill in:**

- a. communicating with participants from a wide variety of backgrounds.
- b. selection of participant outcome parameters.

C. Create a positive environment for participant adherence and outcomes by incorporating effective motivational skills, communication techniques and behavioral strategies.

**1) Knowledge of:**

- a. current behavior facilitation theories (e.g., health-belief model, Transtheoretical model).
- b. behavioral strategies and coaching methods for improving exercise adoption and maintenance.
- c. communication strategies that foster a positive environment.
- d. methods to educate participant in motivational skills and behavioral strategies.
- e. barriers to exercise compliance (e.g., physical, psychological, environmental).
- f. community resources available for participant use following discharge from the program.

D. Collaborate and consult with health care professionals to address clinical issues and provide referrals to optimize participant outcomes.

**1) Knowledge of:**

- a. cardiovascular, pulmonary and metabolic pathologies, clinical progression, diagnostic testing, medical regimens and treatment procedures.
- b. techniques to determine participant's medical history through available documentation.
- c. commonly used medication for cardiovascular, pulmonary and metabolic diseases.
- d. tools for measuring clinical exercise tolerance (e.g., heart rate, glucometry, subjective rating scales).
- e. risk factor reduction programs and alternative community resources (e.g., dietary counseling/Weight Watchers<sup>®</sup>, smoking cessation, physical therapy/back care).
- f. psychological issues associated with acute and chronic illness (e.g., anxiety, depression, suicidal ideation).
- g. assessment tools to measure psychosocial health status.
- h. accepted methods of referral.
- i. community resources available for participant use following program discharge.

**2) Skill in:**

- a. collaborative decision making.
- b. interpretation of psychosocial assessment tools.

# 1. Old Syllabus of Record

## SYLLABUS OF RECORD

HPED 414 Exercise Electrocardiography

2c-01-1cr

### I. Course Description

Provides an introduction to the basic concepts of electrocardiography, including an understanding of electrophysiology, electrode lead placement, both rhythm strips and 12-lead interpretation. Utilizing electrocardiograms students will also be able to recognize normal and abnormal rhythms including those ECG abnormalities brought about by exercise. ECG changes resulting from Graded Exercise Testing will also be evaluated.

Corequisites/Prerequisite: HPED 343, Physiology of Exercise

### II. Course Outcomes

Students completing this course will be able to:

1. Interpret cardiac electrophysiology.
2. Interpret electrode placement and lead systems for a single monitoring and 12-Lead ECG.
3. Interpret components of the normal resting 12-lead electrocardiogram.
4. Recognize abnormal rhythms including those due to chamber enlargement, conduction abnormalities, myocardial ischemia and patterns of infarction.
5. Interpret ECG changes associated with incremental exercise testing for both normal and those with CAD.

### III. Detailed Course Outline

- |   |       |
|---|-------|
| A. Basic Electrocardiography and lead placement           | (15%) |
| 1. Coronary artery disease                                |       |
| 2. Scheme for ECG interpretation                          |       |
| 3. Components of the ECG                                  |       |
| B. Dysrhythmias   | (20%) |
| 1. SA node and atrial arrhythmias                         |       |
| 2. Junctional arrhythmias                                 |       |
| 3. Ventricular arrhythmias                                |       |
| C. Blocks   | (15%) |
| 1. Normal electrical conduction                           |       |
| 2. 1 <sup>st</sup> -3 <sup>rd</sup> degree blocks         |       |
| D. Patterns of Myocardial Ischemia, Injury and Infarction | (25%) |
| 1. Myocardial Infarction                                  |       |
| 2. Myocardial Ischemia                                    |       |
| 3. Myocardial Injury                                      |       |

- E. Graded Exercise Testing (25%)
1. Normal exercise ECG
  2. Abnormal exercise ECG
  3. Practice graded exercise testing

**IV. Evaluation Methods**

*Evaluation of the student will consist of:*

Perform and Evaluate 12-Lead ECG	20%
Homework Assignments	20%
Mid-term – written exam	20%
Graded Exercise Test	20%
Final Exam – written	20%

**V. Example Grading Scale**

90% to 100%	= A
80% to 89%	= B
70% to 79%	= C
60 % to 69%	= D
Below 60%	= F

**VI. Undergraduate Course Attendance Policy**

Attendance will be taken every class. Any material missed due to an unexcused absence cannot be made up after the class. Each student is allowed 3 unexcused absences. For every additional unexcused absence there will be a deduction of 1 LETTER GRADE from the final grade.

*To qualify as an excused absence, students must provide appropriate documentation on the day you return to class. Excused absences only include personal illness as documented by MD note or documented funeral of immediate family. Written notification from the University Health Center is not accepted as an excused absence. Only students with an appropriate excused absence will have the opportunity to make up any missed work. Unexcused absences on exam days will result in a zero score for exam or quiz. Students with excused absences will be given a separate essay exam.*

**VII. Required Text**

*Huszur, R.J. Basic dysrhythmias: interpretation and management, 3<sup>rd</sup> Edition. Mosby, Philadelphia, PA 2001*

**Recommended Text & Internet Sites**

*Conover, M.B. Understanding Electrocardiography 8th Edition, Mosby, St. Louis, MO 2003.*

**ECG Practice Diagnostic Websites:**

<http://www.unm.edu/lkravitz/EKG/ekgwebsites.html>

<http://www.unm.edu/lkravitz/EKG/ekg.html>

**VIII. Special Resource Requirements**

None required