City College of San Francisco
Course Outline of Record

I. GENERAL DESCRIPTION

A.	Approval Date	October 2013
B.	Department	Health Care Technology
C.	Course Number	EMTP 125
D.	Course Title	Cardiorespiratory Emergencies
E.	Course Outline Preparer(s)	Megan Corry
F.	Department Chairperson	Peggy Guichard
G.	Dean	Terrance Hall Terry Hall, Dean John Adams Campus/ School of Health & P.E.

II. COURSE SPECIFICS

A.	Hours	Lecture – 64 total Conference – 20 total
B.	Units	4.5
C.	Prerequisites	Acceptance into Paramedic Program
	Corequisites	None
	Advisories	None
D.	Course Justification	The course content reflects the material outlined in the National EMS Education Standards. This course also includes clinical contact hours in the hospital.
E.	Field Trips	No
F.	Method of Grading	Letter
G.	Repeatability	0

III. CATALOG DESCRIPTION

Assessment and management principles in EMS advanced life support care of patients with respiratory and cardiovascular emergencies in the prehospital and in-hospital setting. Includes ECG interpretation of dysrhythmias and 12-Lead ECG. Advanced cardiac life support guidelines and preparation for certification.

IV. MAJOR LEARNING OUTCOMES

Upon completion of this course a student will be able to:

A. Interpret an ECG rhythm and identify dysrhythmias that originate from the sinus node, atria, AV junction and ventricles.
B. Interpret an ECG rhythm and identify disorders of conduction in the Sinus node, AV node and bundle branches.
C. Correlate ECG changes to imbalances in electrolytes, body temperature and toxins.
D. Identify common home medications prescribed for patients with pulmonary and cardiovascular disease histories.
E. Identify the prehospital medications used to treat pulmonary and cardiovascular emergencies including indications, contraindications, mechanism of action, dosages, route/rate, and precautions.

F. Demonstrate proper basic and advanced life support management of critical and stable cardiorespiratory patients within the scope of practice of a paramedic.
G. Demonstrate the systematic patient assessment used for patients with respiratory distress, chest pain and other cardiorespiratory complaints.
H. Given a patient scenario, identify the most likely etiology using information obtained from patient history, clinical findings and foundational knowledge of pathophysiology.
I. Given a patient scenario, use critical thinking skills to determine the preferred method of treatment for patients with pulmonary and cardiovascular complaints.
J. Demonstrate proper technique when performing basic and advanced airway and ventilatory skills on live patients in the operating room rotation.
K. Demonstrate correct placement of the 12-Lead ECG on simulated patients in class and on live patients in hospital rotations.
L. Demonstrate accurate ECG rhythm identification on patient during hospital rotations.
M. Demonstrate safe and proper use of the portable ECG monitor/defibrillator when performing ECG interpretation, sychronized cardioversion, transcutaneous cardiac pacing and defibrillation on simulated patients in class and on live patients in hospital rotations.

V. CONTENTS

A. Pulmonary physiology and pathophysiology
    1. Ventilation, diffusion and perfusion: normal and abnormal
    2. Assessment principles for patients with respiratory distress
    3. Diagnostic tests
        a. Pulse oximetry
        b. Capnography
        c. Spirometry
B. Specific disorders of the pulmonary system
    1. Airway obstruction
    2. Obstructive airway disease
        a. Emphysema
        b. Chronic bronchitis
        c. Asthma and status asthmaticus
    3. Pneumonia
    4. Acute (or Adult) respiratory distress syndrome (ARDS)
    5. Pulmonary embolism
    6. Spontaneous pneumothorax and tension pneumothorax
    7. Lung cancer
    8. Hyperventilation syndrome
C. Differential Diagnosis of pulmonary disorders
    1. Chief complaint and history of present illness (PASTE)
    2. Associated symptoms and pertinent negatives
    3. Significant past medical history and common home medications
    4. Physical exam findings
D. Pharmacological management of pulmonary emergencies in prehospital care

1. Bronchodilators
    a. Beta agonists
    b. Anticholinergics
    c. Methylxanthines
2. Anti-inflammatories
    a. Steroids
    b. Leukotriene antagonists

E. Ventilatory management in patients with respiratory distress
1. Oxygen delivery
2. Bag valve mask ventilation assistance
3. Continuous positive airway pressure (CPAP) and bilevel positive airway pressure (BiPAP)
4. Ventilating with an advanced airway

F. Cardiovascular physiology and pathophysiology
1. Risk factors and prevention strategies
2. Anatomy and physiology of heart: review

G. Electrophysiology and ECG fundamentals
1. Electrophysiology of the heart
    a. Electrical conduction system
    b. Autonomic nervous system effects on the heart and conduction system
    c. Membrane potentials and propagation of an impulse
2. Mechanisms of ectopic electrical impulse formation
3. 12-Lead placement
4. 12-Lead ECG interpretation
    a. Axis determination
    b. ST segment elevation and location of myocardial injury
    c. Differentiating ventricular tachycardia from supraventricular tachycardia
5. Artifact
6. my new item

H. Dysrhythmia recognition
1. Steps in rhythm analysis
2. Classification, clinical significance and management of dysrhythmias
3. Sinus rhythms
    a. Normal sinus rhythm
    b. Sinus bradycardia
    c. Sinus tachycardia
    d. Sick sinus syndrome (or Tachy-brady syndrome)
    e. Sinus dysrhythmia
    f. Sinus arrest and block
4. Atrial rhythms
    a. Premature atrial complexes
    b. Wandering atrial pacemaker
    c. Multifocal atrial tachycardia
    d. Atrial flutter
    e. Atrial fibrillation
    f. Atrial tachycardia

5. Junctional rhythms
    a. Premature junctional complexes
    b. Junctional escape rhythm
    c. Accelerated junctional rhythm and junctional tachycardia
    d. Supraventricular tachycardia
6. AV blocks
    a. First degree
    b. Second degree: Wenckebach and Mobitz II
    c. Third degree
    d. Artificial pacemaker rhythms
7. Ventricular rhythms
    a. Premature ventricular complexes
    b. Ventricular escape beats and rhythm
    c. Ventricular tachycardia
    d. Ventricular fibrillation

I. Pre-excitation syndromes, conduction problems and other ECG abnormalities
1. Wolff-Parkinson-White syndrome (WPW)
2. Bundle branch blocks
3. Hypothermia
4. Electrolyte abnormalities: potassium, calcium and pH
5. Digitalis toxicity
6. Repolarization and ST segment changes

J. Specific disorders of the cardiovascular system
1. Acute coronary syndromes
    a. Angina: stable and unstable
    b. Acute myocardial infarction
    c. S-T elevation myocardial infarction (STEMI)
2. Pericardial tamponade
3. Dissecting thoracic aortic aneurysm
4. Abdominal aortic aneurysm (AAA)
5. Hypertensive emergencies
6. Other vascular abnormalities

K. Differential diagnosis of chest pain
1. Chief complaint and history of present illness (OPQRST)
2. Associated symptoms and pertinent negatives
3. Significant past medical history and common home medications
4. Physical exam findings

L. Pharmacological management of cardiovascular emergencies in prehospital care
1. Antidysrhythmic agents: Class I, II, III, IV and miscellaneous
    a. ACLS algorithm: Bradycardias and AV blocks
    b. ACLS algorithm: Tachycardias
2. Drugs used to treat acute coronary syndromes
    a. Nitrate vasodilators
    b. Analgesics
    c. Antiplatelets and anticoagulants
    d. Fibrinolytics and glycoprotein antagonists

3. Antihypertensive agents
4. Drugs used to improve cardiac output
   a. ACLS algorithm: Shock
   b. Cardiogenic shock
5. Drugs used in cardiac arrest
   a. ACLS algorithm: Pulseless arrest
   b. PEA/asystole
   c. Pulseless ventricular tachycardia and Ventricular fibrillation
   d. Return of spontaneous circulation: ACLS algorithm on ROSC

M. Procedures used to treat cardiovascular emergencies
1. Vagal maneuvers
2. Synchronized cardioversion
3. Trancutaneous cardiac pacing
4. Unsynchronized cardioversion (defibrillation)
5. Therapeutic hypothermia

N. Clinical hospital rotations as assigned

VI. INSTRUCTIONAL METHODOLOGY

A. Assignments
1. In-class Assignments
   a. Pathophysiology worksheets: students may work in small groups to review pathophysiology and complete worksheets designed to encourage transfer of learning.
   b. ECG rhythm worksheets: students work in small groups to practice using the stepwise method of rhythm analysis and interpret sinus, atrial, junctional, AV blocks and ventricular rhythms.
2. Out-of-class Assignments
   a. Chapter reading from the textbooks as assigned on the course syllabus to be completed before the class session.
   b. Online assignments:
      1. Review of posted slides and outlines.
      2. Take online multiple-choice quizzes associated with each Chapter before coming to class.
      3. Forum discussion: participate in message board discussion related to topics discussed in class as method of continuous study and peer-guided learning.

B. Evaluation
1. In class assignments (ECG rhythm worksheets, pathophysiology worksheets) will be awarded points based upon completion and accuracy of content.
2. Written examinations including multiple-choice, true/false, short answer critical thinking questions within each topic area, designed to assess foundational knowledge, application and analytical skills in the cognitive domain.
   a. In class quizzes: Weekly quizzes to assess the cognitive skills on subject matter discussed in previous week of class.

b. Comprehensive final examination covering all assigned chapters and additional materials provided by the instructor.

3. Online participation will be graded for quality of posted discussion items and completion of quizzes by deadline.
4. Clinical rotations as assigned with emphasis on clinical assessment and treatment associated with cardiorespiratory patients.

C. Textbooks and other instructional materials

1. Rapid Interpretaton of EKG's 6th Edition by Dubin. Cover Publishing Company, Tampa, Florida, 2000.
2. Mosby's Paramedic Textbook, revised 3rd edition. Mosby/Elsevier Publishing, St. Louis, Missouri, 2007.
3. 2010 Advanced Life Support Provider Textbook and companion CD. American Heart Association Publisher, 2010.
4. 2010 Handbook of Emergency Cardiovascular Care for Healthcare Providers. American Heart Association Publisher, 2010.
5. Insight Learning Management System (Moodle), City College of San Francisco, 2011.
6. Handouts provided by the instructor of case studies and updated materials from EMS standards and guidelines on emergency cardiovascular and respiratory care.

VII. TITLE 5 CLASSIFICATION

CREDIT/DEGREE APPLICABLE (meets all standards of Title 5. Section 55002(a)).