**Las Positas College**
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**Course Outline for EMS 51**

**EMT-P HUMAN SYSTEMS**

**Effective: Fall 2010**

I. CATALOG DESCRIPTION:
EMS 51 — EMT-P HUMAN SYSTEMS — 4.00 units

Overview of the structure and function of the major body systems, organization of the body, immunologigial, and homeostatic mechanisms. Discussion of the underlying pathophysiological principles of emergent conditions. Prerequisite: Emergency Medical Services 50 (completed with a grade of "C" or higher). 4 hours lecture.

4.00 Units Lecture

**Prerequisite**
EMS 50 - EMT-P Preparatory Theory
with a minimum grade of C

**Grading Methods:**
Letter Grade

**Discipline:**

| | MIN |
|---|---|
| **Lecture Hours:** | 72.00 |
| **Total Hours:** | 72.00 |

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

**Before entering the course a student should be able to:**

A. EMS50
1. compare and contrast EMS systems, the safety/well-being of the paramedic, and medical/legal and ethical issues which are intended to improve the health of EMS personnel, patients, and the community
2. describe the history of EMS, demonstrates an understanding of EMS systems, roles/responsibilities/professionalism of EMS personnel, principles of quality improvement and patient safety with a complex depth, and comprehensive breadth of knowledge
3. analyze research principles to interpret literature and advocate for evidence-based practice
4. assess and implement provider safety techniques, understand standard safety precautions, personal protective equipment, lifting and moving patients and preventing disease transmission
5. practice wellness principles including stress management, coping with death and dying, and preventing workplace injuries
6. produce a comprehensive and in depth report that lists and describes the components of a prehospital medical record and produce a comprehensive report from data provided
7. demonstrate an understanding of, EMS communication systems, interpersonal communications with other health care professionals, and paramedic team communication processes
8. demonstrate an understanding of principles of communicating with patients in a calm and professional manner that achieves a positive patient care giver relationship. Compare and contrast factors that affect communication between members of the EMS health care team
9. identify interviewing techniques designed for dealing with difficult patients. Compare and contrast methods of adjusting communication strategies for patients with different ages, stages of development, and patients with special needs
10. demonstrate an understanding and knowledge of medical legal topics such as: Consent/refusal of care , Confidentiality of medical records, Advance health care directives, Tort and criminal actions, Statutory responsibilities, Mandatory reporting for the health care provider, Health care regulation
11. summarize the relevant issues regarding the following topics in medical ethics facing the paramedic: Patient rights/advocacy, End-of-life Issues, Ethical principles/moral obligations, Ethical tests and decision making
12. apply fundamental knowledge of principles of public health and epidemiology including public health emergencies, health promotion, and illness and injury prevention

IV. MEASURABLE OBJECTIVES:

**Upon completion of this course, the student should be able to:**

A. recognize the anatomy and function of the upper airway, heart, vessels, blood, lungs, skin, muscles, and bones as the foundation of emergency care and compare and contrast the how constituent systems' injury or failure contributes to an emergency disease process
B. apply fundamental knowledge of the anatomy and function of all human systems to the practice of EMS
C. interpret knowledge of the anatomy and physiology of the airway, respiratory and circulatory systems to the practice of EMS and management of respiratory and cardiac emergencies

D. categorize the anatomy and physiology of all human systems that can produce an emergent medical condition
E. use foundational anatomical and medical terms and abbreviations in written and oral communication with colleagues and other health care professionals
F. demonstrate an understanding of the principles of pathophysiology by developing a written report on each of the emergent medical conditions presented in a case study

V. CONTENT:
A. Introduction to Pathophysiology and Immunology
    1. Correlation of Pathophysiology with Disease Process
B. Basic Cellular Review
    1. Major classes of cells
    2. Chief cellular functions
    3. Cellular components
    4. Tissue types
C. Alterations in cells and tissues
    1. Cellular adaptation
    2. Cellular injury
    3. Manifestation of cellular injury
    4. Cellular death/ncrosis
D. The Cellular Environment
    1. Distribution of body fluids
    2. Aging and distribution of body fluids
    3. Water movement between ICF and ECF
    4. Water movement between plasma and interstitial fluid
    5. Alterations in water movement – Edema
    6. Water balance and the role of electrolytes
    7. Acid-base balances
E. Genetics and Familial Diseases
    1. Factors causing disease
    2. Analyzing disease fisk
    3. Combined effects and interaction among risk factors
    4. Common familial disease and associated risk factors
F. Hypoperfusion
    1. Pathogenesis
    2. Types of shock
    3. Multiple Organ Dysfunction Syndrome (MODS)
    4. Cellular metabolism impairment
G. Self-Defense Mechanisms
    1. Introduction—lines of defense
    2. Characteristics of the immune response
    3. Introduction of the immune response
    4. Humoral immune response
    5. Cell-mediated immune response
    6. Cellular interactions in the immune response
    7. Fetal and neonatal immune function
    8. Aging and the immune response in elderly
H. Inflammation
    1. The acute inflammatory response
    2. Mast cells
    3. Plasma protein systems
    4. Cellular components of inflammation
    5. Cellular products
    6. Systemic responses of acute inflammation
    7. Chronic inflammation responses
    8. Local inflammation responses
    9. Phases of resolution and repair
    10. Aging and self-defense mechanisms
I. Variances in Immunity and Inflammation
    1. Hypersensitivity: allergy, autoimmunity, and isoimmunity
    2. Immunity and inflammation deficiencies
J. Stress and Disease
    1. Concepts of stress
    2. Stress responses
    3. Stress, coping, and illness interrelationships
K. Lifespan Development
    1. Infancy (birth to 1 year)
        a. Physiological
        b. Psychosocial development
    2. Toddler (12 to 36 months) and pre-school age (3 to 5 years)
        a. Physiological
        b. Psychosocial
    3. School age children (6 to 12 years)
        a. Physiological
        b. Psychosocial
    4. Adolescence - (13 to 18 years)
        a. Physiological
        b. Psychosocial
    5. Early adulthood (20 to 40 years)
        a. Physiological
        b. Psychosocial
    6. Middle adulthood (41 to 60 years)
        a. Physiological
        b. Psychosocial
    7. Late adulthood (61 years and older)
        a. Physiological
        b. Psychosocial

VI. METHODS OF INSTRUCTION:
A. **Lecture** -

B. **Discussion** - Group Discussion
C. **Audio-visual Activity** - Selected Video and AV Aids
D. Learning Resource Center use
E. Oral and written reports
F. Reading Assignments
G. Simulated problem solving

VII. TYPICAL ASSIGNMENTS:
A. Complete workbook exercises after completing lecture readings.
B. Prepare simulated patient case history reports.
C. Prepare a class presentation on assigned lecture topics related to course.

VIII. EVALUATION:
A. **Methods**

1. Other:
   a. Multiple Choice Examinations
   b. Midterm Examination
   c. Final Examination
   d. Short Essay Examinations
   e. Oral Presentations

B. **Frequency**

1. Recommend weekly examinations
2. Homework assigned for each topic completed
3. Midterm and Final Exam

IX. TYPICAL TEXTS:
1. Bryan E. Bledsoe et. al. *Paramedic Care; Principles & Practice, Vol. 1-5.* 3rd ed., Brady-Prentice Hall Health, 2008.
2. Bryan E. Bledsoe et. al. *Student Workbook for Paramedic Care; Principles & Practice, Vol. 1-5.* 3rd ed., Brady-Prentice Hall Health, 2008.

X. OTHER MATERIALS REQUIRED OF STUDENTS:
A. Stethoscope
B. Penlight