

**CENTRAL TEXAS COLLEGE
SYLLABUS FOR EMSP 1273 ADVANCED AIRWAY MANAGEMENT**

Semester Hours Credit: 2

INSTRUCTOR:

OFFICE HOURS:

I. INTRODUCTION

- A. A thirty-two contact hour course for the pre-hospital care provider emphasizing advanced airway management. The course is designed to introduce pre-hospital care providers to the procedures of advanced airway care used in dealing with acute airway problems. To this aim the course covers anatomy and physiology of the airway, the signs and symptoms of respiratory problems, and the procedures and devices used to manage the airway in the pre-hospital setting.**
- B. The course is meant to advance the capability of pre-hospital care providers at the EMT-B level to understand and deal with conditions leading to acute respiratory distress. This will enable them to better assist paramedics and other medical care providers during advanced airway care procedures. Specifically, the course teaches the theory and practice of the use of devices not usually covered in an EMT-B certification course. Those devices are: endotracheal tube, Combitube, and the Laryngeal Mask Airway.**
- C. This course is occupationally related and it may be used for continuing education credit to maintain certification in the field of Emergency Medical Technology at the Basic level.**
- D. Prerequisite: EMSP 1401/1160, or EMT-B licensure, or other training in pre-hospital medical care.**

II. LEARNING OUTCOMES

Upon successful completion of this course, EMSP 1291 Special Topics in EMT/Advanced Airway Management, the student will:

- A. Identify on a diagram and on a mannequin the structures of the upper and lower airway. (F1)**

- B. Given a set of arterial blood gas results explain their physiological clinical significance. (C7,F1,F10, F12)**
- C. Relate pulse oxymetry readings to a patient's clinical condition. (C7, F1, F10, F12)**
- D. Relate spirometry reading to a patient's clinical condition. (C7, F1, F10, F12)**
- D. Given recorded samples of various respiratory sounds, identify the sounds and their clinical significance. (C7, F5, F10, F12)**
- E. Given a specific respiratory emergency, describe its treatment in the pre-hospital setting. (C5, C7, F9, F10, F12)**
- F. Perform an endotracheal intubation on an adult mannequin. (C3, C15, C18, C19, F9, F10)**
- G. Perform an endotracheal intubation on an infant mannequin. (C3, C15, C18, C19, F9, F10)**
- H. Perform an airway intubation on an adult mannequin using a multilumen airway. (C3, C15, C18, C19, F9, F10)**
- I. Perform an airway intubation on an adult mannequin using a Laryngeal Mask Airway. (C3, C15, C18, C19, F9, F10)**
- J. Assist in endotracheal intubation of adult and infant mannequins. (C3, C9,C15, C18, C19, F9, F10)**

III. INSTRUCTIONAL MATERIALS

- A. Required Text: Gregg S. Margolis, MS, NREMT-P Airway Management Paramedic, Jones and Bartlett, First Edition (ISBN 0-7637-1327-9)**

IV. COURSE REQUIREMENTS:

- A. This course follows the lesson plans of the manual *Airway Management Paramedic*. For organizational purposes the course is divided into three sections. The introductory section includes an overview of emergency airway management and ventilation, relates airway anatomy to clinical findings, and covers respiratory physiology. The second section focuses on the evaluation of airway patency and ventilatory efficiency. The third section covers the management of respiratory problems including supplemental oxygen therapy, review of BLS techniques, positive pressure ventilation, endotracheal intubation, and nonsurgical alternatives to endotracheal intubation. At the end of the course the students must pass a written test and a practical test. During the practical exam the student must demonstrate the steps of endotracheal intubation on a mannequin, show proficiency in aiding a higher medical professional during endotracheal intubation, and correctly identify normal and abnormal respiratory sounds.
- B. The course will be taught through lecture, demonstrations, and practice on adult and infant mannequins.

NOTE: CTC Attendance Policy

The following statements are from the Central Texas College Student Handbook: "Students are required to attend regularly, all classes in which they enrolled. Students are required to be in class on time."

"Absences from classes, for any reason, must not exceed College standards. Students may be administratively withdrawn from any class when their absences exceed a total of four class meetings in a long semester, three class meetings for an eleven-week, eight-week semester, or for a six-week semester, and in the opinion of the instructor, they cannot satisfactorily complete the course. The final decision rest solely with the instructor."

V. EXAMINATIONS

There will be one practical exam and one written exam. The practical exam will be graded on a pass-fail basis and must be passed for the student to pass the course. The written exam will be the final exam and will determine the letter grade the student obtains for the course.

VI. SEMESTER GRADE COMPUTATIONS

The grading scale is as follows:

A 90-100

B 80-89.9

C 70-79.9

D 60-69.9
F 0-59.9

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

- A. **Course Withdrawal:** It is the student's responsibility to officially withdraw from a course if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file a Central Texas College Application for Withdrawal (CTC Form 59). The withdrawal form must be signed by the student.

CTC Form 59 will be accepted at any time prior to Friday of the 12th week of classes during the 16-week fall and spring semesters. The deadline for sessions of other lengths is:

10-week session Friday of the 8th week
8-week session Friday of the 6th week
5-week session Friday of the 4th week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

A student who officially withdraws will be awarded the grade of "W" provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the College before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

- B. **Administrative Withdrawal:** An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on CTC Form 59 for submission to the registrar.
- C. **Incomplete Grade:** The College catalog states, "An incomplete grade may be given in those cases where the student has completed the majority of the coursework but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course." Prior approval from the instructor is required before the grade of "I" for Incomplete is

recorded. A student who merely fails to show for the final examination will receive a zero for the final and an “F” for the course.

- D. **Cellular Phones and Beepers:** Cellular phones and beepers will be turned off while the student is in the classroom or laboratory.
- E. **American’s With Disabilities Act (ADA):** Students requiring accommodations for disabilities are responsible for notifying the instructor. Reasonable accommodations will be granted in full compliance with federal and state law and Central Texas College policy.
- F. **Instructor Discretion:** The instructor reserves the right of final decision in course requirements.
- G. **Civility:** Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

VIII. COURSE OUTLINE

- A. **Lesson One: Introduction**
 - 1. **Learning Outcomes:** Upon successful completion of this lesson, the student will:
 - a. Explain the primary objective of airway maintenance.
 - b. Identify commonly neglected prehospital skills related to airway.
 - c. Explain the risk of infection to EMS providers associated with ventilation.
 - d. Identify the anatomy of the upper and lower airway.
 - e. Describe the functions of the upper and lower airway.
 - f. Explain the relationships between pulmonary circulation and respiration.
 - g. List the concentration of gases that comprise atmospheric air.
 - h. Describe the measurement of carbon dioxide in the blood.
 - i. List the factors that cause decreased oxygen concentrations in the blood.
 - j. List the factors that increase and decrease carbon dioxide production in the body.
 - k. Define FiO₂.
 - l. Define and differentiate between hypoxia and hypoxemia.
 - m. Describe the voluntary and involuntary regulation of respiration.

- n. Describe the modified forms of respiration.
- o. Define normal respiratory rates and tidal volumes for the adult, child, and infant.
- p. List the factors that affect respiratory rate and depth.

2. **Learning Activities:**

- a. View audio-visual aids and synthetic replicas of the respiratory system. (C5, F1, F10)

3. **Equipment and Materials:**

- a. Computer-projector set-up.
- b. Instructor-prepared handouts
- c. Adult airway management mannequin
- d. Pediatric airway management mannequin
- e. Vital-Sim mannequin

4. **Audio-Visual Aids:**

- a. Instructor's Tool Kit CD ISBN: 0763731269
- b. Wilkins, Hodgkin, Lopez Fundamentals of Heart and Lung Sounds CD Mosby ISBN: 0-323-02528-5

5. **Lesson Outline:**

- a. Introduction to emergency airway management and ventilation
- b. Clinical airway anatomy
- c. Physiology of the respiratory system

B. Lesson Two: Evaluation of airway patency and ventilatory efficiency.

1. **Learning outcomes:** Upon successful completion of this lesson, the student will:

- a. Define the gag reflex.
- b. Describe the measurement of oxygen in the blood.
- c. Describe the measurement of carbon dioxide in the blood.
- d. Describe peak expiratory flow.
- e. Define pulsus paradoxus.
- f. Define and explain the implications of partial airway obstruction with good and poor air exchange.
- g. Define complete airway obstruction.
- h. Describe causes of complete airway obstruction.
- i. Describe causes of respiratory distress.
- j. Describe complete airway obstruction maneuvers.
- k. Perform pulse oximetry.
- l. Perform peak expiratory flow testing.
- m. Perform complete airway obstruction maneuvers.
- n. Perform retrieval of foreign bodies from the upper airway.

2. **Learning activities**

- a. View audio-visual aids or material of patients in respiratory distress. (C5, F5, F10)

- b. Listen to recorded normal and abnormal respiratory sounds. (C5, F5, F10)
 - c. Review and perform BLS obstructed airway maneuvers on mannequins. (C5, C18, C19, F5, F10, F12)
 - d. Carry out pulse oxymeter readings. (C5, C18, C19, F5, F10, F12)
 - e. Carry out spirometry readings. (C5, C18, C19, F5, F10, F12)
 - f. Using a stethoscope listen to breath sounds on other students. (C5, F5, F10, F12)
3. **Equipment and Materials:**
- a. Computer-projector set-up.
 - b. Instructor-prepared handouts.
 - c. Adult airway management mannequin
 - d. Pediatric airway management mannequin
 - e. Vital-Sim mannequin
 - f. BLS mannequin
 - g. Pulse oxymeter
 - h. Spirometer
 - i. stethoscope
4. **Audio-Visual Aids:**
- a. Instructor's Tool Kit CD ISBN: 0763731269
 - b. Wilkins, Hodgkin, Lopez Fundamentals of Heart and Lung Sounds CD Mosby ISBN: 0-323-02528-5
5. **Lesson Outline:**
- a. Airway patency
 - b. Ventilatory efficiency
 - c. Clinical decision making

C. Lesson Three: Management of respiratory problems

1. Learning outcomes

- I. Supplemental Oxygen Therapy. Upon successful completion of this lesson, the student will:**
- a. Define atelectasis.
 - b. Explain safety considerations of oxygen storage and delivery.
 - c. Identify types of oxygen cylinders and pressure regulators.
 - d. List the steps for delivering oxygen from a cylinder and regulator.
 - e. Describe the use advantages, and disadvantages of an oxygen humidifier.
 - f. Describe the indications, contraindications, advantages, disadvantages, complications, liter flow range, and concentration of delivered oxygen for supplemental oxygen delivery devices.

- g. Define, identify, and describe a tracheostomy, stoma, and tracheostomy tube.
 - h. Perform oxygen delivery from a cylinder and regulator with an oxygen delivery device.
 - i. Perform oxygen delivery with an oxygen humidifier
 - j. Deliver supplemental oxygen to a breathing patient using the following devices: nasal cannula, nonrebreathing mask, partial rebreathing mask.
- II. Basic Airway Management.** Upon successful completion of this lesson, the student will:
- a. Describe manual airway maneuvers.
 - b. Explain the purpose for suctioning the upper airway.
 - c. Identify types of suction equipment.
 - d. Describe the indications for suctioning the upper airway.
 - e. Identify types of suction catheters, including hard or rigid catheters and soft catheters.
 - f. Identify techniques of suctioning the upper airway.
 - g. Identify special considerations of suctioning the upper airway.
 - h. Describe the use of an oral and nasal airway.
 - i. Describe the indications, contraindications, advantages, disadvantages, complications, and technique for inserting an oropharyngeal and nasopharyngeal airway.
 - j. Perform manual airway maneuvers.
 - k. Demonstrate suctioning the upper airway by selecting a suction device, catheter, and technique.
 - l. Demonstrate insertion of an oropharyngeal airway.
 - m. Demonstrate insertion of a nasopharyngeal airway.
- III. Positive Pressure Ventilation.** Upon successful completion of this lesson, the student will:
- a. Describe the Sellick maneuver.
 - b. Define gastric distention.
 - c. Describe the indications, contraindications, advantages, disadvantages, complications, equipment, and technique for inserting a nasogastric tube and orogastric tube.
 - d. Identify special considerations of gastric decompression.
 - e. Perform the Sellick maneuver.
 - f. Demonstrate insertion of the nasogastric tube.
 - h. Demonstrate insertion of the orogastric tube.
 - i. Perform gastric decompression by selecting a suction device, catheter, and technique.
 - j. Describe the indications, contraindications, advantages, disadvantages, complications, and techniques for ventilating a patient by: mouth-to-mouth, mouth-to-nose, one-person bag-valve-mask, two-person bag-valve-mask,

three-person bag-valve-mask, flow-restricted, oxygen powered ventilation device.

k. Explain the advantage of the two-person method when ventilating with the bag-valve-mask.

l. Describe indications, contraindications, advantages, disadvantages, complications, and technique for ventilating a patient with a FROPVD.

m. Define, identify, and describe a laryngectomy.

n. Define how to ventilate a patient with a stoma, including mouth-to-stoma ventilation.

o. Describe the special considerations in airway management and ventilation in patients with facial injuries.

p. Demonstrate ventilating a patient by the following techniques: mouth-to-mouth ventilation, mouth-to-mask ventilation; one-person bag-valve-mask, two-person bag-valve-mask, three-person bag-valve-mask, flow-restricted, oxygen-powered ventilation device; mouth-to-stoma; bag-valve-mask-to-stoma ventilation.

!V. Endotracheal Intubation. Upon successful completion of this lesson, the student will:

a. Differentiate endotracheal intubation from other methods of advanced airway management.

b. Describe the indications, contraindications, advantages, disadvantages, and complications of endotracheal intubation.

c. Describe laryngoscopy for the removal of a foreign body airway obstruction.

d. Describe the indications, contraindications, advantages, disadvantages, complications, equipment, and technique for digital endotracheal intubation.

e. Describe the indications, contraindications, advantages, disadvantages, complications, equipment, and technique for nasotracheal intubations.

f. Describe methods of assessment for confirming correct placement of an endotracheal tube.

g. Describe methods for securing an endotracheal tube.

h. Perform BSI procedures during airway management.

i. Intubate the trachea on a mannequin by the following methods: orotracheal intubation, nasotracheal intubation, digital intubation, transillumination.

j. adequately secure and endotracheal tube.

k. Describe the indications, contraindications, advantages, disadvantages, complications, equipment, and technique of tracheobronchial suctioning in the intubated patient.

l. Identify special considerations of tracheobronchial suctioning in the intubated patient.

- m. Describe methods of assessment for confirming correct placement of an endotracheal tube.
 - n. Describe the indications, contraindications, advantages, disadvantages, complications, equipment, and technique for extubation.
 - o. Perform tracheobronchial suctioning in an intubated mannequin by selecting a suction device, catheter and technique.
 - p. Perform extubation on a mannequin.
 - q. Describe the indications, contraindications, advantages, disadvantages, complications, equipment, and technique for using a dual-lumen airway.
 - r. Intubate the trachea of a mannequin using multi-lumen airways.
 - s. Intubate the trachea of a mannequin using the laryngeal mask airway.
2. **Learning activities**
- a. Review and perform assembling an oxygen tank and a regulator and administer oxygen to a patient using various oxygen delivery devices. (C18, C19, F8, F10, F12)
 - b. Practice basic airway management techniques and suctioning on a mannequin. (C18, C19, F8, F10, F12)
 - c. Practice positive pressure ventilation with a pocket mask, a bag-valve-mask, and a flow restricted, oxygen-powered ventilation device on a mannequin. (C18, C19, F8, F10, F12)
 - d. Practice endotracheal intubation on adult and infant mannequins. (C18, C19, F8, F10, F12)
 - e. Practice extubating adult and infant mannequins. (C18, C19, F8, F10, F12)
 - f. Practice insertion of multilumen and laryngeal mask airway. (C18, C19, F8, F10, F12)
3. **Equipment and Materials:**
- a. Computer-projector set-up.
 - b. Instructor-prepared handouts
 - c. Adult airway management mannequin
 - d. Pediatric airway management mannequin
 - e. Vital-Sim mannequin
 - f. Oxygen tank and regulator
 - g. Oropharyngeal and nasopharyngeal airways of varying sizes.
 - h. Suction devices, electrical and manual.
 - i. Oxygen delivery devices: simple face mask, nonrebreather mask, and nasal cannula.
 - j. Laryngoscopes, curved and straight blades, pediatric and adult sizes.

- k. Endotracheal tubes, pediatric and adult sizes**
- l. colorimetric capnometer**
- m. Multilumen airways**
- n. Laryngeal Mask Airways.**

4. Audio-Visual Aids:

- a. Instructor's Tool Kit CD ISBN: 0763731269**

5. Lesson Outline:

- a. Supplemental oxygen therapy**
- b. Basic Airway Management techniques**
- c. Positive Pressure Ventilation**
- d. Techniques of positive pressure ventilation.**
- e. Endotracheal intubation**
- f. Techniques of endotracheal intubation**
- h. Postintubation Procedures**
- i. Nonsurgical Alternatives to Intubation.**