PREREQUISITES: Admission to the Respiratory Therapy Program, or permission of the instructor.

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckccbookstore.com, for the required texts for your particular class.

COURSE DESCRIPTION: Topically, the class includes Gas Physics, Oxygen Therapy, Microbiology applications and Pulmonary Hygiene. Students identify clinical applications of technical data, and review physiology effects of Respiratory Therapy. Students focus on therapeutic indications, contraindications, and hazards in this Lecture/Lab course.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, learning experiences, and performances outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:
1. Patient Positioning
   A. mobilization of secretions
   B. gas distribution by position
   C. perfusion distribution by position
   D. relief of dyspnea by position
II. Vital Signs
   A. pulse oximetry
   B. breathing pattern
   C. respiratory rate
   D. blood pressure
   E. heart rate, rhythm, and force

III. Identify Cardiopulmonary Status
   A. Inspection to identify:
      1. muscle wasting
      2. general appearance
      3. diaphoresis
      4. digital clubbing
      5. cyanosis
      6. chest configuration
      7. evidence of diaphragmatic movement
      8. accessory muscle activity
      9. asymmetrical chest movement
     10. intercostal and/or sternal retractions
     11. character of cough
   B. Palpation to identify:
      1. tactile fremitus
      2. tenderness
      3. heart rate, rhythm, and force
      4. secretions in the airway
      5. tracheal deviation
   C. Percussion to identify:
      1. diaphragmatic excursion
      2. areas of altered resonance
   D. Auscultation to identify:
      1. friction rubs
      2. increased/decreased/absent breath sounds
      3. dysrhythmias
      4. stridor
      5. bilateral normal breath sounds
      6. rhonchi
      7. rales
      8. wheeze
   E. Interview patient to identify:
      1. sputum production
      2. exercise tolerance and ADL’s
      3. physical environment, social support
      4. systems, nutritional status
   F. Inspect chest x-ray to identify:
      1. consolidation
      2. atelectasis
      3. blunting of costophrenic angles
      4. flattening of diaphragm
      5. patency and size of major airways
      6. mediastinal shift
G. Perform procedures to identify:
   1. ECG status
   2. apnea events/apnea monitoring
   3. tidal volume
   4. minute volume
   5. peak expiratory flow rate
   6. Inspiratory capacity

IV. Gas Physics
   A. Boyle’s law
   B. Charles’ law
   C. Gay-Lussac’s law
   D. Dalton’s law
   E. Universal gas law
   F. Poiselle’s law
   G. Hooke’s law

V. Regulation of Gas Flow
   A. regulator stages
   B. thorpe tubes
   C. bourbon gauge
   D. reducing valves
   E. flow rates
   F. compensated versus uncompensated
   G. tank time factors
   H. safety

VI. Medical Gas Therapy – Oxygen Therapy and Devices
   A. external respiration
   B. blood oxygen transport
   C. internal respiration
   D. nasal cannula
   E. venti mask
   F. continuous high humidity
   G. non rebreather
   H. oxygen analyzer
   I. oxygen blenders
   J. He/02
   K. CO2/02
   L. hazards of oxygen

VII. Compress Gases
   A. tank markings
   B. air compressors
   C. bulk oxygen
   D. color codes
   E. cylinder safety and transport

VIII. Aerosol and Humidity Therapy and Devices
   A. relative humidity
   B. absolute humidity
   C. partial pressure
D. nebulizers
E. sidestream
F. mainstream
G. babbington
H. ultrasonic
I. jet
J. underwater jet
K. MDI
L. atomizer
M. all-purpose nebulizer
N. humidifiers
O. bubbler
P. passover
Q. cascade
R. wick
S. HME

IX. Hyperinflation Therapy
   A. coughing and deep breathing
   B. incentive breathing devices

X. Infection Control
   A. microbiology specimen collection
   B. microbiology lab results
   C. sputum culture, sensitivity, gram stain
   D. acid fast bacillus
   E. microorganism transmission
   F. contact
   G. airborne
   H. vehicle
   I. vector
   J. equipment processing
   K. decontamination
   L. disinfection
   M. sterilization
   N. isolation techniques
   O. universal precautions
   P. respiratory isolation
   Q. body substance isolation
   R. personal protective equipment
   S. nosocomial infections
   T. prevention
   U. identification
   V. handwashing techniques
   W. differentiation of viral/bacterial infections
   X. normal flora of upper/lower airway and of the GI tract
   Y. effects and characteristics of gram negative pneumonia
   Z. introduction to antibiotic therapy

XI. Clinical Knowledge Base
A. medical gas therapy and oxygen devices
B. oxygen supply systems
C. oxygen administration
D. manual resuscitation
E. pulse oximetry monitoring
F. aerosol enclosures
G. patient assessment
H. vital signs
I. breath signs
J. ECG’s
K. physical assessment
L. patient positioning
M. incentive spirometry
N. infection control
O. handwashing
P. isolation procedures
Q. asepsis monitoring
R. equipment processing
S. body mechanics
T. patient transport

EXPECTED LEARNER OUTCOMES:
A. The student will be able to review equipment used in medical gas and aerosol therapy.
B. The student will be able to express indications for medical gas and aerosol therapy.
C. The student will be able to apply algebraic and scientific principles to medical gas and aerosol therapy.
D. The student will be able to discuss medical device safety.
E. The student will be able to distinguish infection control practices.

COURSE COMPETENCIES:
The student will be able to review equipment used in medical gas and aerosol therapy.
1. The student will be able to identify safety considerations, and therapeutic objectives of oxygen therapy and delivery devices.
2. The student will be able to identify safety considerations, and therapeutic objectives of aerosol/humidity therapy and devices.
3. The student will be able to describe characteristics of various gas regulation devices.

The student will be able to express indications for medical gas and aerosol therapy.
4. The student will be able to select aerosol therapy to match patient acuity.
5. The student will be able to select humidity therapy to match patient acuity.
6. The student will be able to select oxygen therapy to match patient acuity.
7. The student will be able to select hyperinflation therapy to match patient acuity.
8. The student will be able to identify, differentiate, and describe normal and abnormal characteristics for heart rate, respirations, blood pressure, and breath sounds.
9. The student will be able to describe chest auscultation.
10. The student will be able to explain chest palpation.
11. The student will be able to define adventitious breath sounds.
12. The student will be able to describe normal and abnormal breathing patterns.
13. The student will be able to define the four lung capacities.
14. The student will be able to define the four lung volumes.
The student will be able to apply algebraic and scientific principles to medical gas and aerosol therapy.

15. The student will be able to define and perform algebraic application of the gas laws and physics.
16. The student will be able to discuss relative humidity.
17. The student will be able to calculate humidity deficit.

The student will be able to discuss medical device safety.

18. The student will be able to identify safety considerations of medical gas therapy.
19. The student will be able to identify safety considerations for compressed gases, and the effects on human physiology.
20. The student will be able to identify safety considerations, and therapeutic objectives of hyper-inflation therapies.
21. The student will be able to identify safety considerations of patient positioning.
22. The student will be able to identify safety considerations of body mechanics.
23. The student will be able to apply BLS in a patient scenario.

The student will be able to distinguish infection control practices.

24. The student will be able to identify safety considerations of infection control, microbiology, define universal precautions, and describe methods and limitations of decontamination, disinfection, and sterilization.

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exam, written assignments, and class participation

SPECIAL NOTE:

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact Director of the Academic Resource Center at 913-288-7670.