

**UNIVERSITY OF SOUTH ALABAMA
COLLEGE OF ALLIED HEALTH PROFESSIONS
DEPARTMENT OF CARDIORESPIRATORY CARE**

CRC 440 – Advanced Clinical I (W)
Fall Semester

6 semester hours
Course Format: Web-enhanced

COURSEMASTERS: Jenny McDaniel, Bill Pruitt, Bill Wojciechowski
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OFFICE HOURS: Wednesday and Friday 1:00-3:00 P.M.; Thursday 8:00 A.M.-3:00 P.M. Students are advised to call the office to set up appointments that might require a lengthy time.

COURSE DESCRIPTION: Section 101: Clinical experiences will involve the care of neonatal and pediatric patients who receive intermittent and intensive cardiorespiratory care, as discussed in the cases in CRC 430. Students will prepare and present case studies relevant to this patient population.
Section 102: Clinical experiences will involve patients who receive intensive cardiovascular procedures and pulmonary function testing, and bronchoscopy as discussed in CRC 431. Students will prepare and present case studies relevant to this patient population.
Section 103: Clinical experiences involve the care of patients who are placed in subacute settings and in the sleep laboratory as discussed in CRC 431.

COURSE CONTENT: Section I – Neonatal/Pediatric Respiratory Care
Section II – Cardiopulmonary Diagnostics
Section III – Subacute Care

ATTENDANCE FOR CLINICAL ROTATIONS:

Punctuality and regular, uninterrupted attendance is expected for each rotation at every clinical site. Additionally, you are expected to be present for the entire scheduled time for a rotation with no early departures. If you anticipate being tardy or absent, you must call the clinical site and the CRC department (445-9284) within 15 minutes of the starting time of the clinical rotation. An excused absence or tardiness requires that you must have a legitimate reason for the occurrence. When you call the office to report being tardy or absent you need to give a reason with your message. Early departure from a rotation must have authorization from the director of clinical education (DCE).

The penalties for unexcused absences and for early departures from a clinical site are (1) reduction of one letter grade from the final course grade for each occurrence, and (2) the addition of two clinical make-up days scheduled at the discretion of the DCE.

The penalty for unexcused tardiness is (1) a reduction of the final course grade by 5.0% for each occurrence, and (2) the addition of two clinical make-up days. (No one at the clinical site has authority to approve early dismissal of a student, unless an emergency or an extenuating circumstance arises at the clinical site.) Excused absences will also require make-up days (one for one). In the event of any absence, the student must discuss the issue in person with the DCE within three business days of returning to class to arrange for the make-up days. See Definition of Terms and Penalties for Attendance Violations in Attachment A.

EVALUATION:

Students will be assessed according to their abilities to perform various tests and procedures, operate equipment, and interpret data. Evaluations will occur via a written comprehensive final examination, performance checklists, affective assessments, case studies, and the score on the NBRC CPFT Self Assessment Exam (SAE). Successful completion of this course is defined as achieving a minimum average of 70% on all assessments. The comprehensive final examination will be comprised of multiple choice questions. Final grades will be determined as follows: A: 90 to 100%; B: 80 to 89%; C: 70 to 79%; D: 60 to 69%; F: 0.0 to 59%. The final course grade will be determined as follows:

I. Typhon system (appropriate usage)	5%
II. Checklists	20%
II. Affective assessments	20%
III. Comprehensive final exam	35%
IV. CPFT SAE	<u>20%</u>
Total	100%

STUDENTS WITH DISABILITIES:

In accordance with the Americans with Disabilities Act, students with bona fide disabilities will be afforded reasonable accommodations. The Office of Special Student Services (OSSS) will certify a disability and advise faculty members of reasonable accommodations. If you have a specific disability that qualifies you for academic accommodations, please notify the instructor/professor and provide certification from the Office of Special Student Services. OSSS is located at 5828 Old Shell Road at Jaguar Drive, (251-460-7212).

STUDENT ACADEMIC CONDUCT POLICY

The University of South Alabama's policy regarding Student Academic Conduct Policy is found in The Lowdown <http://www.southalabama.edu/lowdown/academicconductpolicy.shtml>: The University of South Alabama is a community of scholars in which the ideals of freedom of inquiry, freedom of thought, freedom of expression, and freedom of the individual are sustained. The University is committed to supporting the exercise of any right guaranteed to individuals by the Constitution and the Code of Alabama and to educating students relative to their responsibilities.

Policy on plagiarism software. Students may learn about the meaning of plagiarism and how to avoid it at the following link:

<http://www.southalabama.edu/univlib/instruction/plagiarismforstudents.html>.

ONLINE WRITING SUPPORT

The University of South Alabama provides online writing tutoring services through SMARTHINKING, an on-line tutoring service. SMARTHINKING is available at <http://services.smarthinking.com>. Students may enter the site by logging on with their Jag number and using the last four digits of the social security number as the password. For log-on problems, technical questions and/or on-campus writing assistance, contact the USA Writing Center at 251-460-6480 or e-mail csaint-paul@usouthal.edu.

Information about the University Writing Center and Online Writing Lab can be found on-line at <http://www.southalabama.edu/univlib/instruction/antiplagiarism/writinghelp.html>.

ACADEMIC DISRUPTION POLICY

The University of South Alabama's policy regarding Academic Disruption is found in The Lowdown, the student handbook.

<http://www.southalabama.edu/lowdown/academicdisruption.shtml> :

Disruptive academic behavior is defined as individual or group conduct that interrupts or interferes with any educational activity or environment, infringes upon the rights and privileges of others, results in or threatens the destruction of property and/or is otherwise prejudicial to the maintenance of order in an academic environment.

The faculty expects students to be cordial, courteous and respectful of faculty members and fellow students.

TEXTBOOKS AND RESOURCES:

Section 101: Neonatal/Pediatrics - Whitaker's Comprehensive Perinatal & Pediatric Respiratory Care, 3rd ed.

Section 102: Cardiopulmonary Diagnostics - *White's Clinical Lab Competencies*, 5th ed., *Egan's Fundamentals of Respiratory Care*, 10th ed.

Section 103: Subacute Care – *Egan's Fundamentals of Respiratory Care*, 10th ed.

CHANGES IN COURSE REQUIREMENTS:

Not all classes progress at the same rate thus course requirements might have to be modified as circumstances dictate. You will be given written notice by email if the course requirements need to be changed.

CLINICAL SCHEDULES:

Each of the 3 sections has its own clinical schedule.

CRC 440- Advanced Clinical I

GOALS and OBJECTIVES: Upon successful completion of the course, students will gain clinical skills in subacute care, cardiopulmonary diagnostics, and neonatal/pediatric respiratory care.

Section 101 Neonatal/Pediatric Respiratory Care

Unit I: The Normal Birth and Assessment of the Newborn

Through oral, written, and performance assessment, the student will be able to:

- Describe the normal birth process including circulatory adaptation and first breath.
- Assess an infant following birth including:
 - A. Normal vital signs
 - B. Apgar score
 - C. Blood gas value
- Recognize anatomic and physiologic differences between the newborn and adult including:
 - A. Thermal control
 - B. Nose breathing
 - C. Compliance/Resistance
 - D. Lung structure

Unit II: Anticipating the High Risk Infant

Through oral, written, performance assessment, the student will be able to:

- Identify maternal and fetal high-risk factors
- Understand various methods of fetal assessment and monitoring including:
 - A. Heart rate monitoring
 - B. Amniocentesis (L/S ratio)
 - C. Ultrasound

Unit III: Stabilization of the High-Risk Infant

Through oral, written, and performance assessment, the student will be able to:

- Demonstrate proficiency in resuscitation and intubation
- Recognize important points of stabilization and evaluation
- Recognize and treat special respiratory problems

Unit IV: Evaluation of the High-Risk Infant

Through oral, written, and performance assessment, the student will be able to:

- Perform early assessment of a high risk infant to include:
 - A. Dubowitz scoring for prematurity
 - B. Assessing size vs. gestational age
- Perform proper blood gas evaluations including:
 - A. Sampling techniques
 - B. Blood gas analysis and interpretation
- Evaluate the newborn chest x-ray
- Use the transcutaneous monitors

- Recognize the potential value of capnography to the NICU

Unit V: Diseases that Cause Respiratory Distress

Through oral, written, and performance assessment the student will demonstrate an understanding of the following diseases.

- Respiratory distress syndrome (RDS)
- Meconium aspiration syndrome (MAS)
- Persistent pulmonary hypertension of the newborn (PPHN)
- Pneumonia, sepsis
- Transient tachypnea of the newborn (TTN)
- Choanal atresia
- Diaphragmatic hernia
- Congenital cardiac anomalies
- Tracheo-esophageal fistula, esophageal atresia, abdominal wall defects
- Apnea of prematurity
- Bronchopulmonary dysplasia, retinopathy of prematurity
- Pneumothorax, pneumomediastinum, pulmonary interstitial emphysema (PIE)
- Neuromuscular disease

Unit VI: Respiratory Care Management and Techniques

Through oral, written, and performance assessment, the student will be able to:

- Provide supportive therapies for sick neonates including:
 - A. Oxygen
 - B. CPAP
 - C. Mechanical ventilation
 - D. Surfactant administration
 - E. Nitric Oxide
- Perform appropriate modes of bronchial hygiene including:
 - A. Suctioning
 - B. Chest Physiotherapy
 - C. Aerosol Therapy

Unit VII: Infant and Pediatric Transport

Through oral, written, and performance assessment the student will be able to:

- Set up the transport ventilator and incubator
- Recognize the basic organization and roles of the transport team and transport van

Section 102 Cardiopulmonary Diagnostics

Unit I - Cardiovascular Procedures

Through written evaluation and performance checklists, the student will be able to:

- Inter-relate the three basic components of a biomedical recording instrument.
- Describe the electrical hazards associated with monitoring equipment.
- Discuss the insertion procedures of a central venous pressure (CVP) line and arterial line.
- Describe venous blood sampling.
- Explain pulmonary artery and pulmonary artery wedge pressure monitoring.
- Identify right and left pressures and waveforms.
- Describe the various types of catheters used for left heart catheterization.
- Describe the procedure for diagnosing coronary artery disease and for PTCA and stent placement
- Describe the procedure for obtaining electrophysiology information and ablation techniques
- Describe the insertion procedure of a PA (Swan-Ganz) catheter.
- State the problems associated with balloon-tipped catheters.
- Apply hemodynamic monitoring to cardiac and lung disease
- Discuss the following aspects of intra-arterial pressure monitoring:
 - normal waveforms and values
 - monitoring sites
 - method
 - arterial blood sampling
 - disinfection

Unit II - Pulmonary Function Testing

Through written evaluation and performance checklists, the student will be able to:

- Describe the procedure, technique, and significance of the following lung volume tests:
 - vital capacity (VC)
 - inspiratory capacity (IC)
 - expiratory reserve volume (ERV)
 - functional residual capacity (FRC)
 - 1. open-circuit method – nitrogen washout
 - 2. close-circuit method – helium dilution
 - body plethysmography (thoracic gas volume)
 - total lung capacity (TLC)
 - residual volume/total lung capacity ratio (RV/TLC)
- Perform the following tests/procedures
 - Calibrate the spirometer, nitrogen analyzer, plethysmography, carbon monoxide analyzer, methane analyzer.
 - FVC determination, flow/volume loops, volume/time curves
 - FRC determination
 - Body plethysmography
 - Nitrogen washout

Diffusion (DLCO)

- Perform a pulmonary history on a patient.
- Perform before and after bronchodilator studies.
- Interpret the data obtained from before and after bronchodilator studies.
- Describe the procedure, technique and significance of exercise testing.
- Describe the procedure, technique and significance of bronchial challenge testing

Unit III - Bronchoscopy

Through written evaluation and performance checklists, the student will be able to:

- Demonstrate the preparation of medications used before, during and after bronchoscopy to include:
 - A. local anesthetics
 - B. bronchodilators
 - C. mucolytics
 - D. vasoconstrictors
- Understand the indications for fiberoptic bronchoscopy. Include rigid and flexible bronchoscopes.
- Understand/describe the following procedures:
 - A. Bronchoalveolar lavage
 - B. Brushing and washing
 - C. Protected brush (Wimberly)
 - D. Wang needle biopsy sampling
 - E. Biopsy procedures - forceps and needle
 - F. Therapeutic bronchoscopy
- Demonstrate the assistant's roles in the bronchoscopy procedure.
- Demonstrate the processing of specimens as a result of diagnostic procedures for:
 - A. Microbiology
 - B. Cytology
 - C. Virology
 - D. Surgical pathology
- Describe proper bronchoscope cleaning technique.
- Demonstrate patient monitoring procedures.
 - A. Vital signs
 - B. Pulse oximetry
 - C. Blood gas sampling
 - D. Physical observations
- Calibrate the following equipment:
 - A. spirometers
 - B. gas analyzers
 - C. plethysmographs
 - D. blood gas analyzers
- Apply quality control measures to the following equipment:
 - A. spirometers
 - B. gas analyzers
 - C. plethysmographs
 - D. blood gas analyzers

Section 103 – Subacute Care

Unit I - Pulmonary Rehabilitation

Unit #1 - Mode

Unit #2 - Frequency

Unit #3 - Duration

Unit #4 - Intensity

Through written and performance evaluation, the student will be able to:

- Monitor the client's
 - progress
 - performance
 - on the various equipment.
- Advise the client concerning the frequency of each exercise modality.
- Prescribe the appropriate duration for each form of exercise.
- Determine the appropriate degree of exercise intensity for each client.
- Auscultate patient to assess efficacy of intervention.
- Institute oxygen therapy.
- Obtain SpO₂ measurements.
- Refill portable O₂ canisters.
- Provide 15 minute lecture to pulmonary rehab patients.
- Describe the correct technique for performing pursed-lip breathing, and list three common errors.
- Describe appropriate responses to the following situations: acute SOB and expiratory wheezing.
- List three drugs from each of the following medication classes, and describe the principle action of each drug listed:
 - bronchodilators
 - corticosteroids
 - antihistamines
- Describe what is meant by the expressions “pink puffer” and “blue bloater.”
- List the affects of extended bed rest on cardiopulmonary and musculoskeletal function.
- List the clinical termination criteria for an exercise session for a COPD patient.
- Describe the effects of aging on the respiratory system (i.e., oxygen saturation, response to exercise).
- Explain the anatomical pathway of airflow through the respiratory system.
- Explain the anatomical pathway of blood flow through the cardiovascular system.
- Define maximal oxygen uptake and discuss the HR/ $\dot{V}O_2$ correlation.
- Discuss the role of the respiratory muscles during exercise, include the rest/recovery requirements.

Unit II - Home Respiratory Care

Through written and performance evaluation, the student will be able to:

- Discuss the development of respiratory therapy in the home environment.
- Distinguish between durable medical equipment (DME) and home health services.
- Identify the significance of discharge planning.
- Identify the personnel and their functions of the discharge planning team.
- Identify outside health or social services available for patient needs.
- Describe an appropriate home environment for a home care patient.
- Describe a patient assessment with home respiratory care.
- State the type of patient or clinical situations requiring home oxygen.
- Describe the use of a transtracheal catheter for oxygen delivery.
- List the three forms of home oxygen systems.
- Differentiate among these three forms of home oxygen systems.
- Evaluate the proper function of a home oxygen concentrator.
- Differentiate between a nasal CPAP unit and a BIPAP unit.
- Identify the various forms of headgear and masks for use with non-invasive respiratory assistance.
- State example of clinical situations utilizing nasal CPAP and BIPAP in a home care environment.
- State the type of patient or clinical situations requiring home apnea monitoring.
- Define a three or four channel study.
- Describe the home equipment necessary for a humidified tracheostomy collar.
- State the type of patient or clinical situations for home ventilatory support.
- Describe the function and usage of the Puritan-Bennett LP-6 ventilator.
- Describe the circuit for a home ventilator.
- Evaluate the proper function for the LP-6 ventilator.
- Identify the general characteristics of home respiratory equipment.
- Discuss different ethical aspects of home respiratory care.
- Differentiate between the three general forms of reimbursement.
- Identify criteria for Medicare reimbursement of home oxygen.

Unit III - Sleep Disorders

Through written and performance evaluation, the student will be able to:

- Gain an understanding of various sleep disorders including: sleep apnea (central, obstructive, and mixed sleep apnea), narcolepsy, and nocturnal myoclonus.
- Identify the various parameters monitored during a sleep study and the equipment used.
- Recognize the various stages of sleep by examining a polysomnogram.
- Understand the application of mask CPAP in the treatment of obstructive sleep apnea.

Unit IV – Long-Term Care

Through written and performance evaluation, the student will be able to:

- Evaluate/modify respiratory care plans for long term care patients.
- Perform respiratory therapy procedures based on established respiratory care protocols.
- Perform airway management procedures.
- Conduct mechanical ventilation on long-term care patients.
- Participate in interdisciplinary team meetings.

Attachment A

Definition of Terms

An **unexcused absence** is either:

- failure of a student to arrive at the appointed time to a scheduled clinical site without providing advanced notification by telephone to both the clinical site and to the Department of Cardiorespiratory Care regarding an anticipated absence, and failure to provide documentation concerning that absence to the director of clinical education (DCE) within three business days following that absence. (“Advanced notification” must be as early as possible, but at least 15 minutes before the scheduled starting time for the clinical rotation.)

OR

- arrival at a clinical site either 30 minutes or more after the scheduled time of arrival, or absence from an entire clinical day, without providing advanced notification by telephone to the Department of Cardiorespiratory Care and to the clinical site, and failure to provide documentation concerning that occurrence to the DCE within three business days following that absence.

An **unexcused tardiness** is both:

- failure of a student to provide advanced notification by telephone to a clinical site and to the Department of Cardiorespiratory Care regarding an anticipated tardiness

AND

- arrival at a clinical site 30 minutes or less after the scheduled time of arrival

An **early departure from a clinical site** is defined as a student vacating a clinical site before the scheduled time of dismissal without authorization from the director of clinical education.

The DCE may declare an absence **excused** if (1) circumstances justify the absence, (2) advanced notification is provided, and (3) appropriate documentation is presented to the DCE. Clinical time missed because of an excused absence will be subject to rescheduling at the discretion of the DCE.

Penalties for Attendance Violations

The penalties for **unexcused absences** and for **early departures from a clinical site** are (1) reduction of one letter grade from the final course grade for each occurrence, and (2) the addition of two clinical make-up days scheduled at the discretion of the DCE.

The penalty for **unexcused tardiness** is (1) a reduction of the final course grade by 5.0% for each occurrence, and (2) the addition of two clinical make-up days. (No one at the clinical site has authority to approve early dismissal of a student, unless an emergency or an extenuating circumstance arises at the clinical site.)