Respiratory Care Technology
Mississippi Curriculum Framework

Program CIP: 51.0908– Respiratory Care Therapist/Therapy

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The Office of Curriculum and Instruction (OCI) was founded in 2013 under the Division of Workforce, Career, and Technical Education at the Mississippi Community College Board (MCCB). The office is funded through a partnership with The Mississippi Department of Education (MDE), who serves as Mississippi's fiscal agent for state and federal Career and Technical Education (CTE) Funds. The OCI is tasked with developing statewide CTE curriculum, programming, and professional development designed to meet the local and statewide economic demand.

For information, please contact curriculum@mccb.edu.

CONTENTS

ADOPTION OF NATIONAL CERTIFICATION STANDARDS

The National Board for Respiratory Care, Inc. (NBRC) is a voluntary health certifying board which was created in 1960 to evaluate the professional competence of respiratory therapists. The primary purposes of the NBRC and its 31-member Board of Trustees are to provide high quality voluntary credentialing examinations for practitioners of respiratory care; establish standards to credential practitioners to work under medical direction; issue certificates to and prepare a directory of credentialed individuals; advance medicine by promoting use of respiratory care in treating human ailments; support ethical and educational standards of respiratory care; and cooperate with accrediting agencies to support respiratory care education. Since its inception, the NBRC has issued over 350,000 professional credentials to more than 209,000 individuals, and currently tests nearly 40,000 candidates annually. One of the respiratory therapy examinations is the standard for licensure in the 49 states that regulate the profession.

The NBRC is a member of the Institute for Credentialing Excellence (ICE), and the following examination programs are accredited by the National Commission for Certifying Agencies (NCCA): CRT, RRT, CPFT, RPFT, Neonatal/Pediatric Specialty Examination, Adult Critical Care Specialty Examination, and the Sleep Disorders Specialty Examination. Accreditation by the NCCA signifies unconditional compliance with stringent testing and measurement standards among national health testing organizations. This recognition attests to the NBRC's past and continued efforts to maintain the quality and integrity of examination programs on behalf of the respiratory care profession. (http://www.nbrc.org)

Colleges can obtain contact information for a state licensure in Mississippi by contacting:
MS State Department of Health
Professional Licensure – Respiratory Care
PO Box 1700
Jackson, MS 39215
Phone: 601-364-7360
Fax: 601-364-5057

For more information related to the state license in Mississippi, please visit
http://www.msdh.state.ms.us/msdhsite/_static/resources/560.pdf.

INDUSTRY JOB PROJECTION DATA

Respiratory Therapists require an education level of an Associate Degree. There is a projected 19% increase in occupational demand at the national level. Median annual income for Respiratory Therapists is $55,870 at the national level. A summary of occupational data from the Bureau of Labor Statistics is displayed below:

Table 1: Education Level

Program Occupations	**Education Level**
Certified Respiratory Therapist	Associate Degree
Registered Respiratory Therapist	Associate Degree

Table 2: Occupational Overview

	United States (National)
2012 Occupational Jobs	119,300
2020 Occupational Jobs	141,974
Total Change	22,674
Total % Change	19%
2012 Median Hourly Earnings	$26.86
2012 Median Annual Earnings	$55,870
Annual Openings	2,267

INDUSTRY JOB PROJECTION DATA

Respiratory Therapists require an education level of an Associate Degree. There is a 17.47% increase in occupational demand at the regional level and a 21.20% increase at the state level. Median annual income for Respiratory Therapists is $42,107.52 at the state level and $41, 107.52 at the regional level. A summary of occupational data from the State Workforce Investment Board Data Center is displayed below:

Table 1: Education Level

Program Occupations	Education Level
Respiratory Therapists	Associate Degree

Table 2: Occupational Overview

	Region	State	United States
2010 Occupational Jobs	893	1420	122,450
2020 Occupational Jobs	1,049	1,721	145,124
Total Change	156	301	22,674
Total % Change	17.47%	21.20%	18.52%
2010 Median Hourly Earnings	$19.78	$20.24	$24.28
2010 Median Annual Earnings	$41,142.40	$42,107.52	$50,509.33
Annual Openings	15	30	2,267

Table 3: Occupational Breakdown

Description	2010 Jobs	2020 Jobs	Annual Openings	2010 Hourly Earnings	2010 Annual Earnings 2,080 Work Hours
Respiratory Therapists	799	955	15	$22.10	$45,968.00
TOTAL	799	955	15	$22.10	$45,968.00

Table 4: Occupational Change

Description	Regional Change	Regional % Change	State % Change	National % Change
Respiratory Therapists	156	19.52%	23.73%	20.93%

ARTICULATION

Secondary curriculum does not cover content to the depth as the postsecondary curriculum; therefore, the there is no statewide articulation agreement. Local agreements and dual credit partnerships are encouraged.

TECHNICAL SKILLS ASSESSMENT

Colleges should report the following for students who complete the program with a career certificate, technical certificate, or an Associate of Applied Science Degrees for technical skills attainment:

Therapist Multiple Choice Examination ($190.00) *subject to change based on testing agency
Clinical Simulation Examination ($200.00) *subject to change based on testing agency

ONLINE AND BLENDED LEARNING OPPORTUNITIES

Course content included lecture and laboratory semester credit hours. Faculty members are encouraged to present lecture related content to students in an online or blended learning environment. Training related to online and blended learning will be available to faculty members through the MS Community College Board.

INSTRUCTIONAL STRATEGIES

The NBRC standards were adopted and provide instructional strategies to faculty member implementing the curriculum.

ASSESSMENT STRATEGIES

The NBRC Standards were adopted and provide assessment strategies to faculty member implementing the curriculum. Additionally, performance tasks were included in course content when appropriate.

PROGRAM DESCRIPTION

The Respiratory Care Technology program prepares individuals to become respiratory therapists. Respiratory therapists, as members of a team of health-care professionals, work to evaluate, treat, and manage patients of all ages with respiratory, cardiac, and other systemic illnesses. Respiratory therapists are responsible for airway management and the setup and monitoring of life support systems. They provide treatment for heart and lung disorders by administering treatments, oxygen, drugs, and other therapeutic modalities.

The goal is to prepare graduates with demonstrated competence in cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains of respiratory care practice as performed by the registered respiratory therapists (RRTs). The graduate will be well prepared to become a successful and productive part of the work force of the community.

In addition to performing respiratory care procedures, respiratory therapists are involved in clinical decision making (such as patient evaluation, treatment selection, and assessment of treatment efficacy) and patient education. The scope of practice for respiratory care includes, but is not limited to, the following:

- Acquiring and evaluating clinical data
- Assessing the cardiopulmonary status of patients
- Performing and assisting in the performance of prescribed diagnostic studies such as drawing blood samples, performing blood gas analysis, and pulmonary function testing
- Utilizing data to assess the appropriateness of prescribed respiratory care
- Establishing therapeutic goals for patients with cardiopulmonary disease
- Participating in the development and modification of respiratory care plans
- Case management of patients with cardiopulmonary and related diseases
- Initiating ordered respiratory care, evaluating and monitoring patients' responses to such care, modifying the prescribed respiratory therapy and cardiopulmonary procedures, and life support endeavors to achieve desired therapeutic objectives
- Initiating and conducting prescribed pulmonary rehabilitation
- Providing patient, family, and community education
- Promoting cardiopulmonary wellness, disease prevention, and disease management
- Participating in life support activities as required
- Promoting evidence-based medicine, research, and clinical practice guidelines
- Promoting inter-professional skills

Respiratory therapists carry out these duties in a wide variety of clinical settings and are expected to act in a professional manner and conform to the standards and ethics of all health-care professionals. Professional standards integrated into this curriculum include the Commission on Accreditation for Respiratory Care (CoARC) and standards for the National Board for Respiratory Care (NBRC).

Graduates of the Respiratory Care Technology program are eligible to sit for the NBRC Board Exams.

SUGGESTED COURSE SEQUENCE

REQUIRED RESPIRATORY CARE TECHNOLOGY COURSES

Course Number	Course Name	Lecture Hours	Lab Hours	Clinical Hours	Total SCH Hours	Contact Hour
RCT 1213	Respiratory Care Science	3			3	45
RCT 1223	Patient Assessment and Planning	2	2		3	60
RCT 1313	Cardiopulmonary Anatomy and Physiology	3			3	45
RCT 1322	Pulmonary Function Testing	1	2		2	45
RCT 1416	Respiratory Care Technology I	3	6		6	135
RCT 1424	Respiratory Care Technology II	3	2		4	75
RCT 1515	Clinical Practice I			15	5	225
RCT 1523	Clinical Practice II			9	3	135
RCT 1613	Respiratory Care Pharmacology *	3			3	45
RCT 2333	Cardiopulmonary Pathology	3			3	45
RCT 2434	Respiratory Care Technology III	3	2		4	75
RCT 2533	Clinical Practice III			9	3	135
RCT 2545	Clinical Practice IV			15	5	225
RCT 2613	Neonatal/Pediatrics Management	3			3	45
RCT 2713	Respiratory Care Seminar	2	2		3	60

* RCT 1613 can be taught as RCT 1611 and RCT 2622

APPROVED CTE ELECTIVES FOR RESPIRATORY CARE TECHNOLOGY COURSES

Course Number	Course Name	Lecture Hours	Lab Hours	Clinical Hours	Total SCH Hours	Contact Hour
CSC 1113	Computer Concepts	3			3	45
MET 1113	Medical Terminology	3			3	45
MET 1613	Medical Office Terminology I	3			3	45
RCT 1011	Seminar I	1			1	15
RCT 1021	Seminar II	1			1	15
RCT 111 (1–3)	Respiratory Care Practicum	1			3	15
RCT 2031	Seminar III	1			1	15
Other instructor approved electives that are listed in the MCCB approved CTE Uniform Course Numbering system.						

APPROVED ACADEMIC ELECTIVES FOR RESPIRATORY CARE TECHNOLOGY COURSES

Course Number	Course Name	Lecture Hours	Lab Hours	Clinical Hours	Total SCH Hours	Contact Hour
BIO 1514 or 2514	Prerequisites - Anatomy and Physiology I				4	
BIO 1524 or	Pre/Corequisites - Anatomy and				4	

2524	Physiology II					
CPT 1113	Fundamentals of Microcomputer Applications				3	
CHE 1314	Principles of Chemistry I				4	
CHE 1324	Principles of Chemistry II				4	
CHE 1214	General Chemistry I				4	
BIO 2924	Microbiology				4	
PHY 1214	Physics				4	

General Education Core Courses

To receive the Associate of Applied Science Degree, a student must complete all of the required coursework found in the Career Certificate option, Technical Certificate option and a minimum of 15 semester hours of General Education Core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college. The Southern Association of Colleges and Schools (SACS) Commission on Colleges Standard 2.7.3 from the Principles of Accreditation: Foundations for Quality Enhancement1 describes the general education core.

Section 2.7.3 In each undergraduate degree program, the institution requires the successful completion of a general education component at the collegiate level that (1) is substantial component of each undergraduate degree, (2) ensures breadth of knowledge, and (3) is based on a coherent rationale. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours or the equivalent. These credit hours are to be drawn from and include at least one course from the following areas: English composition, humanities/fine arts, social/behavioral sciences, and natural science/mathematics. The courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

1 Southern Association of Colleges and Schools Commission on Colleges. (2012). *The principles of accreditation: Foundations for quality enhancement*. Retrieved from http://www.sacscoc.org/pdf/2012PrinciplesOfAcreditation.pdf

ASSOCIATE OF APPLIED SCIENCE REQUIRED COURSES

Course Number and Name: **RCT 1213 Respiratory Care Science**

Classification: Associate of Applied Science Degree Requirement

Description: This course is designed to introduce the student respiratory care therapist to fundamental elements important to the delivery of health care in a safe, efficient, and professional manner.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
3	3	0	45

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Discuss aspects of patient safety.
   a. Demonstrate basic life support.
   b. Discuss disaster planning and bioterrorism responses.
   c. Demonstrate understanding of OSHA regulations and standard precautions.
   d. Demonstrate proper use of body mechanics.
   e. Discuss fire and electrical safety.
   f. Discuss principles of accident prevention.

2. Discuss aspects of patient comfort.
   a. Discuss cultural diversity.
   b. Apply effective communication skills in the various health-care settings.
   c. Discuss patient management in regard to death and dying.

3. Discuss various aspects of the health-care delivery system.
   a. Discuss the role of various health-care providers, including respiratory therapists.
   b. Discuss the organization and functions of a respiratory care department.
   c. Discuss the legal aspects of respiratory care, including licensure and credentialing.
   d. Discuss the history of respiratory care.
   e. Discuss ethical considerations in respiratory care.
   f. Discuss professional considerations in respiratory care.
   g. Discuss medical billing and reimbursement.

4. Discuss related medical terminology.
   a. Discuss terms related to anatomy and physiology.
   b. Discuss terms related to human disease.
   c. Discuss terms related to patient assessment and diagnosis.
   d. Discuss terms related to the treatment of disease.

5. Describe the role microbiology and infection control play in health care.
   a. Describe the major classifications of microorganisms and the pathological role of each in human disease.
   b. Describe how microorganisms are identified and the role identification plays in treatment.
   c. Describe sputum sampling, gram-stain, culture, and sensitivities.
   d. Describe infection control methods used in respiratory care.
   e. Describe the elimination of infectious sources.
      (1) Describe proper methods of equipment decontamination.

(2) Describe various methods of sterilization and disinfection.
(3) Describe methods of monitoring infection control practices.
(4) Apply isolation procedures.
(5) Describe the spread of infection and how to break the chain of contamination.

6. Demonstrate mathematics as applied to respiratory care.
   a. Perform metric conversions.
   b. Perform decimal and percent conversions.
   c. Calculate ratio and proportion.
   d. Solve for linear equations.
   e. Apply order of operations.
   f. Plot a graph using rules of X-Y coordinates.
   g. Perform temperature conversions.

7. Discuss chemistry and physics as related to respiratory care.
   a. Discuss states of matter and how each state changes.
   b. Discuss gas laws.
   c. Discuss fluid dynamics.
   d. Discuss atomic structure.
   e. Discuss acids, bases, and the pH scale.
   f. Discuss solutions, body fluids, and electrolyte balance.
   g. Discuss temperature scales, and solve conversion problems.
   h. Discuss absolute and relative humidity.
   i. Discuss and calculate compliance and resistance changes in the pulmonary system.

8. Discuss methods of data management in respiratory care.
   a. Discuss computer applications in respiratory care.
   b. Apply various aspects, methods, and formats of record keeping.

Course Number and Name: **RCT 1223 Patient Assessment and Planning**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a fundamental approach to subjective and objective evaluation, assessment, and care plan formation for the individual needs of the patient. It is an introduction to cardiopulmonary diseases including etiology, pathophysiology, complications, occurrences, clinical manifestations, treatment, and prevention.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Utilize Subjective Objective Assessment Plan (SOAP) principles to develop and modify care plans for patients with cardiopulmonary disorders.
   a. Review pertinent existing data in the patient record.
   b. Evaluate additional pertinent clinical information to implement, evaluate, and modify existing patient care plan.
   c. Recommend modifications in the Respiratory Care Plan based on the patient's response.
   d. Assess patient's overall cardiopulmonary status by palpation, inspection, and auscultation.
   e. Differentiate between obstructive and restrictive lung disorders.

2. Explain the etiology, pathophysiology, clinical manifestations, diagnosis, and treatment of cardiopulmonary diseases and conditions.
   a. Evaluate pertinent laboratory values.
   b. Evaluate and interpret radiological studies.
   c. Perform basic patient assessment skills as related to respiratory care.
   d. Evaluate a patient's learning needs as related to age and language appropriateness, education level, prior disease and medication knowledge, and other factors.
   e. Develop a quality improvement program.
   f. Review an interdisciplinary patient and family care plan.

3. Simulate arterial puncture for blood gases with interpretation.

Course Number and Name: **RCT 1313 Cardiopulmonary Anatomy and Physiology**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a study of cardiopulmonary anatomy and physiology in relation to the practice of respiratory care.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
3	3	0	45

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Explain the anatomy of the respiratory system.
   a. Explain the structures that comprise the upper airway.
   b. Explain the structures that comprise the lower airway.
   c. Explain the primary functions of the upper airway.
   d. Describe the structures and functions of the external lung and thorax.

2. Describe the physiology of the respiratory system.
   a. Describe oxygen transport.
   b. Describe carbon dioxide transport.
   c. Describe the physiology of the upper and lower airway.
   d. Define the functional unit of the lung.
   e. Define internal and external respiration.
   f. Describe the mechanics of ventilation.
   g. Explain acid base balance.
   h. Describe neurological control of ventilation.
   i. Describe the role of the renal system in relation to the cardiopulmonary system.

3. Describe the anatomy and physiology of the cardiovascular system.
   a. Identify the structures and functions of the heart.
   b. Describe the major components of the blood.
   c. Identify the structures and functions of the major blood vessels.
   d. Explain the hemodynamic role of the cardiovascular systems.

Course Number and Name: **RCT 1322 Pulmonary Function Testing (PFT)**

Classification: Associate of Applied Science Degree Requirement

Description: This course is an introduction to pulmonary function techniques and testing equipment with patient data evaluation and recommendation based on pulmonary function results.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
3	1	2	45

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Determine the basis for the use of cardiopulmonary tests.
   a. Discuss the indications for pulmonary function testing.
   b. Demonstrate procedures for selected pulmonary function tests.
   c. Explain the significance of pulmonary function test findings.
   d. Discuss stress testing.
   e. Discuss apnea monitoring
   f. Discuss overnight pulse oximetry.

2. Apply principles of pulmonary function tests.
   a. Describe the principles of operation of cardiopulmonary testing equipment.
   b. Describe the principles of operation of pulmonary function equipment.

3. Recognize functions of blood gas and pulmonary function and other equipment utilized in cardiopulmonary testing.
   a. Maintain blood gas instrumentation, calibration, infection control, and quality assurance.
   b. Maintain pulmonary function equipment, calibration, infection control, quality assurance, and other cardiopulmonary monitoring equipment.
   c. Correct malfunctions of pulmonary function, blood gas, and other cardiopulmonary monitoring equipment.

4. Discuss the relationship of disease processes to pulmonary function interpretations.
   a. Evaluate pulmonary function test results and make recommendations for patient care.

Course Number and Name: **RCT 1416 Respiratory Care Technology I**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a study of respiratory treatments, equipment design and operation related to acute care procedures.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
6	3	6	135

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Apply principles of medical gas therapy to respiratory care.
   a. Describe the manufacture, transport, and storage of medical gases.
   b. Demonstrate the operation of medical gas controlling devices to include hyperbaric therapy.
   c. Select appropriate oxygen delivery devices.
   d. Explain the safety procedures, indications, and hazards of medical gas administration.
   e. Demonstrate the assembly and operation of various patient monitors and analyzers.

2. Apply the principles of aerosol/humidity therapy to respiratory care.
   a. Define humidity and aerosol.
   b. Contrast a nebulizer and humidifier.
   c. State the factors that affect humidity output.
   d. Describe factors that affect aerosol penetration and deposition.
   e. Demonstrate the principles of assembly and operation, efficiency, and application of the various types of humidifiers and nebulizers.
   f. Explain the indications and hazards of aerosol and humidity therapy.

3. Apply principles of hyperinflation to respiratory care.
   a. Compare and contrast the major lung expansion techniques.
   b. Compare and contrast the goals, indications, and adverse effects of lung expansion techniques.
   c. Describe the principles of assembly and operation of lung expansion techniques.
   d. Demonstrate the assembly and operation of lung expansion techniques.

4. Apply principles of airway clearance techniques.
   a. Identify the airway clearance segments.
   b. Describe the positions required to drain designated lung segments.
   c. Describe the indications and hazards of airway clearance hygiene techniques.
   d. Perform airway clearance techniques to include coughing technique, autogenic drainage, positive expiratory pressure device (PEP), intrapulmonary percussive ventilation (IPV), Flutter, and High Frequency Chest Wall Oscillation (HFCWO).

5. Apply principles of airway care and manual resuscitation.
   a. Summarize the etiology of upper airway obstruction.
   b. Discuss the indications, hazards, and selection of artificial airways.
   c. Demonstrate the placement of artificial airways.
   d. Demonstrate techniques to monitor, and insure a safe and effective airway.

e. Compare and contrast characteristics of various manual resuscitators.

f. Demonstrate the use of various manual resuscitators.

g. Apply principles of disease management.

(1) Monitor treatment outcomes.

(2) Initiate and modify therapy based on respiratory care protocol.

h. Demonstrate appropriate techniques for removal of bronchopulmonary secretions.

Course Number and Name: **RCT 1424 Respiratory Care Technology II**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a continuation of Respiratory Care Technology I. It is a study of the management of respiratory failure, including mechanical ventilation, pulmonary rehabilitation, and home care.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
4	3	2	90

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Apply concepts related to rehabilitation and home care.
   a. Discuss the goals and techniques of cardiopulmonary rehabilitation.
   b. Discuss the equipment and techniques of respiratory care in the home.

2. Apply concepts related to mechanical ventilation in all patient populations.
   a. Classify mechanical ventilators.
   b. Discuss patient synchrony and physiologic effects of mechanical ventilation.
   c. Discuss indications and hazards of mechanical ventilation.
   d. Demonstrate the setup, monitoring, modification, and discontinuation of mechanical ventilation.
   e. Demonstrate airway management in relation to mechanical ventilation including noninvasive interfaces.
   f. Select, analyze, and adjust ventilator settings according to ventilator graphics.

Course Number and Name: **RCT 1515 Clinical Practice I**

Classification: Associate of Applied Science Degree Requirement

Description: Patient assessment, performance of respiratory care procedures, and care plan formation are practiced in the hospital environment. A procedural guide is utilized to evaluate student competencies and performance of respiratory care procedures.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab/Clinical	Clock Hours
5	0	15	225

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Evaluate patient data, and formulate a care plan.
   a. Review patient record data.
   b. Perform basic patient assessment.
   c. Evaluate pertinent clinical data.
   d. Recommend procedures to obtain additional data.
   e. Write a care plan for a given patient.

2. Perform respiratory care procedures.
   a. Apply medical gas therapy concepts.
   b. Apply aerosol humidity therapy concepts.
   c. Perform lung expansion techniques.
   d. Demonstrate cardiopulmonary resuscitation (CPR).
   e. Perform airway clearance techniques.
   f. Perform basic airway management techniques.
   g. Perform aerosolized drug administration.
   h. Apply methods of infection control.
   i. Troubleshoot equipment.
   j. Demonstrate isolation techniques.
   k. Demonstrate quality control procedures.
   l. Communicate information of patient status to appropriate health-care team members.
   m. Explain planned therapy and goals to patients in understandable terms to achieve optimal therapeutic outcomes.
   n. Communicate results of therapy, and alter therapy per protocols.
   o. Demonstrate techniques in analysis and performance of arterial blood gases.
   p. Demonstrate techniques in performing electrocardiograms.
   q. Participate in physician interaction, inter-professional skills and communication.

Course Number and Name: **RCT 1523 Clinical Practice II**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a continuation of Clinical Practice I. Students rotate through various respiratory care subspecialty areas for evaluation of competency and performance of respiratory care procedures.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab/Clinical	Clock Hours
3	0	9	135

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Perform various basic pulmonary functions tests (PFT).
   a. Demonstrate performance of basic procedures for selected PFT.
   b. Demonstrate knowledge of predicted normal values of PFT.
   c. Observe the regimens for various PFT studies.
   d. Demonstrate quality assurance in use of PFT.
   e. Demonstrate use of equipment used in pulmonary functions testing.

2. Explain the role respiratory care plays in cardiopulmonary rehabilitation.
   a. Discuss the indications and contraindications.
   b. Evaluate, monitor and make recommendations for patients during the rehabilitation process.
   c. Evaluate the issues involved in implementation of a rehabilitation program.
   d. Demonstrate patient education.
   e. Participate in the inter-professional approach to the rehabilitation patient.

3. Demonstrate basic procedures related to invasive and noninvasive ventilation
   a. Adjust ventilator settings according to patient data evaluation.
   b. Evaluate ventilatory flow, volume, and pressure waveforms.
   c. Apply computer technology to patient management such as ventilator waveform analysis, electronic charting, and patient care algorithms.
   d. Maintain records of results of therapy.
   e. Measure auto-PEEP.
   f. Participate in intra-hospital ventilator transport.
   g. Troubleshoot equipment as related to respiratory care.
   h. Participate in physician interaction, inter-professional skills and communication.

Course Number and Name: **RCT 1613 Respiratory Care Pharmacology**

Classification: Associate of Applied Science Degree Requirement

Description: This course is designed to introduce the student to the pharmacology related to cardiopulmonary disorders.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
3	3	0	45

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Apply the principles of pharmacology to respiratory care.
    a. Understand drug utilization related to drugs' names, indications, contraindications, reactions, and interactions, as well as responses to adverse effects.
    b. Explain the routes of administration, discussing aerosol delivery methods, advantages, and disadvantages.
    c. Describe pharmacokinetics of drugs to include absorption, distribution, metabolism, and elimination.
    d. Describe the pharmacodynamics of drugs to include selectivity and specificity; agonists vs. antagonists; and, potency, toxicity, tolerance, and half life.
    e. Discuss the use and administration of specific drug categories related to cardiopulmonary medicine including the following: bronchodilators; mucokinetic and surfactants; anti-inflammatories and anti-asthmatics; anti-infective agents; cardiac agents; blood pressure and anti-thrombotic agents; and neuromuscular, sedative, anesthetic, analgesic agents and smoking cessation drugs.

2. Perform medication calculations for adult, pediatric, and neonatal patients.
    a. Proportionately calculate drug dilution and equivalent dose.
    b. Calculate strength of solutions in percentage and ratio forms.
    c. Calculate weight to weight conversions.
    d. Calculate volume and weight conversions.
    e. Perform conversion of units of measurement within the metric system and between the metric and common household system of measurement (English System).
    f. Modify dosages for age, weight, and body mass index.

Course Number and Name: **RCT 2333 Cardiopulmonary Pathology**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a study of cardiopulmonary pathophysiology. It includes etiology, clinical manifestations, diagnostics and treatment of various cardiopulmonary diseases incorporating clinical practice guidelines, and therapist driven protocols. Case studies and/or clinical simulations will be utilized to enforce learning and evaluate progress.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
3	3	0	45

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Explain the etiology, pathophysiology, and management plan for diseases or patient scenarios affecting the cardiopulmonary system.
   a. Discuss the pathophysiology of diseases.
   b. Enumerate patient and family counseling concerning smoking cessation and disease management education.

2. Apply clinical practice guidelines and therapist driven protocols using Subjective Objective Assessment Plan (SOAP) principles.
   a. Review patient records, and recommend diagnostic procedures to obtain additional data.
   b. Evaluate patient data and make recommendations based on pertinent clinical information.
   c. Interpret results of diagnostic procedures.
   d. Determine appropriateness of the patient's care plan.
   e. Recommend modification of the patient's care plan.

3. Apply the principles of polysomnography as related to diagnostic testing, assessment, and treatment.

Course Number and Name: **RCT 2434 Respiratory Care Technology III**

Classification: Associate of Applied Science Degree Requirement

Description: This course is an advanced study of respiratory care in the critical care setting. Topics include non-conventional modes of mechanical ventilation, hemodynamics, special procedures, and advanced cardiac life support.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
4	3	2	75

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Apply concepts of non-conventional mechanical ventilation.
   a. Recommend non-conventional modes of mechanical ventilation.
   b. Describe the use of non-conventional modes of mechanical ventilation.
   c. Monitor the use of non-conventional modes of mechanical ventilation.
   d. Monitor patient response to non-conventional modes of mechanical ventilation.
   e. Recommend modifications to non-conventional modes of mechanical ventilation.

2. Apply concepts to hemodynamics.
   a. Recommend diagnostic procedures to obtain additional data.
   b. Evaluate additional pertinent clinical information.
   c. Interpret the results of diagnostic procedures.
   d. Recommend modification based on appropriateness of care plans.
   e. Describe assembly, initiation, monitoring, and troubleshooting of hemodynamic monitoring systems.
   f. Review chest X-rays to assure proper placement of central venous and/or pulmonary artery catheters.
   g. Demonstrate arterial line therapy to include insertion, sampling, and maintenance.

3. Apply concepts related to special procedures.
   a. Explain special procedures as described by the National Board for Respiratory Care matrix.
   b. Recommend diagnostic procedures to obtain additional data.
   c. Evaluate additional pertinent clinical information.
   d. Assist the physician performing special procedures.
   e. Describe moderate conscious sedation.
   f. Describe assembly, initiation, monitoring, and troubleshooting of chest tube drainage systems.

4. Apply concepts related to advanced cardiac life support.
   a. Recognize basic arrhythmias.
   b. Recognize stable vs. unstable arrhythmias.
   c. Implement the appropriate algorithm.
   d. Recommend the common cardiopulmonary life support drugs.
   e. Demonstrate operation of defibrillation equipment, including synchronized cardioversion.
   f. Demonstrate emergency airway care procedures, including LMA and Combitube insertion, maintenance, and troubleshooting.

g. Describe assembly, initiation, monitoring, and troubleshooting of transcutaneous and transvenous pacemakers.

Course Number and Name: **RCT 2533 Clinical Practice III**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a continuation of Clinical Practice I and II. Students will rotate through various clinical areas for evaluation of competency, performance and/or observation of respiratory care procedures.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab/Clinical	Clock Hours
3	0	9	135

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe and/or perform advanced diagnostic testing.

2. Perform advanced respiratory care procedures.
   a. Observe and assist in special procedures related to respiratory care.
   b. Evaluate hemodynamic data.
   c. Expand on both conventional and non-conventional modes of mechanical ventilation.
   d. Modify results of therapy, and recommend changes based on protocol(s).
   e. Evaluate arterial blood gases for modification of treatment as related to ventilator management.
   f. Participate in physician interaction, inter-professional skills and communication.

Course Number and Name: **RCT 2545 Clinical Practice IV**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a continuation of Clinical Practice III. Students will rotate through respiratory care areas. A procedural guide is utilized to evaluate student competency and performance.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab/Clinical	Clock Hours
5		15	225

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Perform advanced respiratory care procedures independently.
   a. Analyze hemodynamic data.
   b. Perform selected conventional and non-conventional modes of mechanical ventilation.
   c. Perform critical care procedures.
   d. Evaluate ventilator graphics and recommend changes based on analysis.
   e. Observe or assist in the performance of special procedures related to respiratory care.
   f. Assist in advanced cardiopulmonary life support techniques.

2. Perform neonatal/pediatric respiratory care procedures.
   a. Observe or assist in neonatal/pediatrics management.
   b. Observe or assist in neonatal/pediatric resuscitation techniques.
   c. Participate in physician interaction, inter-professional skills and communication.

3. Present a critical care case presentation.
   a. Collect patient data.
   b. Develop a care plan.
   c. Deliver an oral presentation.

4. Participate in professional development to include temporary licensure, resume building, interview techniques, appropriate attire and social media guidelines.

Course Number and Name: **RCT 2613 Neonatal/Pediatrics Management**

Classification: Associate of Applied Science Degree Requirement

Description: This course is a study of fetal development and the transition to extrauterine environment. It includes the most common cardiopulmonary disorders, neonatal and pediatric disease processes, and the modes of treatment.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
3	3		45

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Apply concepts related to neonatal management.
   a. Discuss the process of fetal lung development.
   b. Describe factors contributing to cardiopulmonary transition between fetal and neonatal life.
   c. Describe techniques of physical assessment of the neonate.
   d. Describe etiology, pathophysiology, clinical manifestations, diagnosis, and treatment of neonatal cardiopulmonary diseases.
   e. Discuss the indications, the hazards, and equipment related to the treatment of neonatal disorders.
   f. Discuss appropriate techniques of treatment of neonatal cardiopulmonary failure according to the Neonatal Resuscitation Program.

2. Apply concepts related to pediatric management.
   a. Describe etiology, pathophysiology, clinical manifestations, diagnosis, and treatment of pediatric cardiopulmonary diseases.
   b. Discuss the indications, hazards, and equipment related to the treatment of pediatric disorders.
   c. Discuss appropriate techniques of treatment of pediatric cardiopulmonary failure according to PALS Resuscitation Guidelines.
   d. Discuss sedation and comfort techniques for pediatric patients as they apply to general floor and ICU care.

Course Number and Name: **RCT 2713 Respiratory Care Seminar**

Classification: Associate of Applied Science Degree Requirement

Description: This course is designed to integrate the essential elements of respiratory care practice through the use of care plans, case studies, and clinical simulations in a laboratory environment. Students will develop an analytical approach to problem solving. Critical thinking is emphasized. (Delivery techniques may include traditional face-to-face or online.)

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Clock Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Review NBRC Detailed Content Outline for the Therapist Multiple Choice Examination.
   a. Complete mock exams.
   b. Discuss NBRC exam content.
   c. Discuss test taking strategies.
   d. Discuss cognitive levels to include recall, application, and analysis.

2. Review NBRC Detailed Content Outline for the Clinical Simulation Examination.
   a. Complete mock exams.
   b. Discuss NBRC exam content.
   c. Discuss test taking strategies.
   d. Discuss cognitive levels to include recall, application, and analysis.

RECOMMENDED TOOLS AND EQUIPMENT

Capitalized Items

Access to some tools and equipment may be provided by Respiratory Care Technology Program facilities.

1. Air compressor, 10–20 PSIG (1 per program)
2. Air compressor, high pressure (50 PSIG) (1 per program)
3. Airways, adult tracheostomy care simulator (2 per program)
4. Airways, fiber optic intubation laryngoscope (1 per 5 students)
5. Analogs, adult, mechanical test lungs (1 per program)
6. Analogs, infant, mechanical test lungs (1 per program)
7. Analytical equipment, assorted aneroid (1 per program)
8. Analytical equipment, spirometer (1 per program)
9. Analytical equipment, calibrated laboratory type (1 per program)
10. Bulk delivery system outlets (1 per 3 students)
11. Cardiac monitor with oscilloscope (1 per program)
12. Chest percussor (1 per 5 students)
13. Defibrillator, with monitor (teaching model)
14. Electrocardiograph, 12 channel (1 per program)
15. Hospital bed, electric (1–5 per program)
16. Humidifiers, ventilator (5 per program)
17. Manikins, adult arterial puncture arm (1 per 5 students)
18. Manikins, infant, arterial arm (1 per 5 students)
19. Manikins, infant intubation (1 per 5 students)
20. Manikins, adult intubation (1 per 5 students)
21. Manikin, ACLS advanced cardiac life support (1 per program)
22. Manikins, patient care with breath and heart sounds (1 per program)
23. Manikins, adult CPR (1 per 5 students)
24. Manikins, infant resuscitation (1 per 5 students)
25. Manikins, pediatric resuscitation (1 per 5 students)
26. Monitor, apnea (1 per program)
27. Nebulizers, aerosol, croup tent (1 per 10 students)
28. Nebulizers, aerosol, ultrasonic (1 per program)
29. Oscillator, high frequency chest wall (HFCWO) (1 per program)
30. Oxygen blender (1 per 10 students)
31. Oxygen concentrator (1 per program)
32. Oxygen Analyzer (1 per 4 students)
33. Analyzer, end tidal carbon dioxide (1 per program)
34. Analyzer, end tidal carbon monoxide (1 per program)
35. Pulse oximeter (2 per program)
36. Respirometer (1 per 5 students)
37. Suction source, piped vacuum (1 per program)
38. Suction source, portable (1 per program)
39. Therapy unit, intrapulmonary percussive (1 per program)
40. Oxygen flow meter (20 per program)
41. Air flow meter (20 per program)

42. Ventilator, bi-pap unit with alarm (1 per program)
43. Ventilator, intrapulmonary percussive
44. Ventilator, volume (1 per program)
45. Ventilator, neonatal mechanical (1 per 5 students)
46. Ventilator, microprocessor controlled with graphics (5 per program)
47. Ventilator, pressure cycled with stand (1 per 3 students)
48. Ventilator, neonatal, high frequency jet ventilator (1 per program)
49 Ventilator, neonatal, oscillator ventilator (1 per program)
50. Wheelchair, standard adult (1 per program)
51. Airway pressure disconnect alarm (1 per program)
52. X-ray view box, large (1 per program)
53. Pulmonary function machine, portable with spirometry and flow volume loop (1 per program)
54. Monitor, transcutaneous oxygen and carbon dioxide monitor (1 per program)
55. Portable liquid oxygen system (1 per program)
56. Computer (1 per 2 students)
57. Model, anatomical, segmental lung (1 per 5 students)
58. Model, anatomical, skeleton (1 per program)
59. Model, anatomical, upper airway (1 per program)
60. Printer, with cable, to be network compatible (1 per 2 computers)
61. Computer carts on wheels (1 per each computer)
62. TV (1 per program)
63. VCR/DVD (1 per program)
64. Video camera, DVD (1 per program)
65. Data video projector (1 per program)
66. Smart board (1 per program)
67. Inhaled nitric oxide delivery system (1 per program)

Non-Capitalized Items

1. Airway, laryngeal mask (1 per program)
2. Blankets (bed) (1 per bed)
3. Blood pressure monitors (1 per 2 students)
4. Pillows (2 per bed)
5. Sheets (3 per bed)
6. Nebulizers, aerosol, all purpose (1 per 5 students)
7. Flutter (1 per 5 students)
8. PEP - Positive Expiratory Pressure device (1 per program)
9. Suction regulator (1 per 5 students)
10. Airways, double lumen (1 per program)
11. Airways, esophageal, tracheal Combitube ETC (1 per program)
12. Airways, assorted sizes and types
13. Airways, cuff pressure manometer (1 per 5 students)
14. Airways, negative inspiratory force meter (1 per 5 students)
15. Analogs, simple test lungs (1 per student)
16. Analytical equipment, calibrated super syringe (1 per program)
17. Analytical equipment, PCO2 electrode (1per program)
18. Analytical equipment, PH electrode (1 per program)
19. Analytical equipment, PO2 electrode (1 per program)
20. Analytical equipment, stopwatches, fast sweep (1 per program)
21. Cart, E cylinder (3 per program)

22. Cart, H cylinder (1 per program)
23. Gauges, bourdon (1 per 5 students)
24. Generator, Downs Flow (1 per program)
25. High pressure delivery tubing (10 air and 10 oxygen per program)
26. Humidifiers, heaters (5 per program)
27. Humidifiers, heaters (wrap-around) (2 per program)
28. Kinetic flow tubes (1 per program)
29. Model, anatomical, heart (1 per 10 students)
30. Resuscitator, adult self-inflating (1 per 5 students)
31. Resuscitator, gas powered (1 per program)
32. Resuscitator, pediatric (1 per 5 students)
33. Resuscitator, neonatal (1 per 5 students)
34. Stethoscope, Doppler (1 per program)
35. Thermometer, electronic, tympanic (1 per program)

Recommended Instructional Aids

It is recommended that instructors have access to the following items:

1. Cart, AV (2 per program)
2. Tool kit (1 per program)
3. Video screen (1 per program)
4. TV (1 per program)
5. VCR/DVD (1 per program)
6. Video camera, DVD (1 per program)
7. Destination presentation system (1 per program)
8. Data video projector (1 per program)
9. Smart board (1 per program)

CURRICULUM DEFINITIONS AND TERMS

- Course Name – A common name that will be used by all community colleges in reporting students

- Course Abbreviation – A common abbreviation that will be used by all community and junior colleges in reporting students

- Classification – Courses may be classified as the following:
    - Career Certificate Required Course – A required course for all students completing a career certificate.
    - Technical Certificate Required Course – A required course for all students completing a technical certificate.
    - Technical Elective – Elective courses that are available for colleges to offer to students.

- Description – A short narrative that includes the major purpose(s) of the course

- Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course

- Corequisites – A listing of courses that may be taken while enrolled in the course

- Student Learning Outcomes – A listing of the student outcomes (major concepts and performances) that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:

- The content of the courses in this document reflects approximately 75% of the time allocated to each course. The remaining 25% of each course should be developed at the local district level and may reflect the following:
    - Additional competencies and objectives within the course related to topics not found in the state framework, including activities related to specific needs of industries in the community college district
    - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
    - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed or revised
    - Activities that include integration of academic and career–technical skills and course work, school-to-work transition activities, and articulation of secondary and postsecondary career–technical programs
    - Individualized learning activities, including work-site learning activities, to better prepare individuals in the courses for their chosen occupational areas

- Sequencing of the course within a program is left to the discretion of the local college. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors. Programs that offer an Associate of Applied Science Degree must include all of the required Career Certificate courses, Technical Certificate courses **AND** a minimum of 15 semester hours of General Education Core Courses. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester. Each community college specifies the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college.

- In order to provide flexibility within the districts, individual courses within a framework may be customized by doing the following:

- Adding new student learning outcomes to complement the existing competencies and suggested objectives in the program framework.
- Revising or extending the student learning outcomes
- Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the Mississippi Community College Board [MCCB] of the change)