



# **INSTRUCTIONAL PACKAGE**

RES 204

Neonatal and Pediatric Care

Effective Term

Fall 2024/Spring 2025/Summer 2025

# INSTRUCTIONAL PACKAGE

## Part I: Course Information

Effective Term: Fall 2024/Spring 2025/Summer 2025

COURSE PREFIX: RES 204

COURSE TITLE: Neonatal and Pediatric Care

CONTACT HOURS: 2 Lecture/3 hour Lab

CREDIT HOURS: 3

### **RATIONALE FOR THE COURSE:**

RES 204 will allow students to identify the anatomical structures and physiological functions related to the fetal and neonatal growth and development. Students will learn about fetal cardiac anomalies and pathologies. As a student you will learn how to manage newborn and pediatric patient's during cardiac arrest emergencies.

### **COURSE DESCRIPTION:**

This course focuses on cardiopulmonary physiology, pathology, and management of the newborn and pediatric patient.

### **PREREQUISITES/CO-REQUISITES:**

Respiratory Care Program third semester courses RES 141. Required prerequisite courses must be completed with a grade of "C" or better.

### **REQUIRED MATERIALS:**

Walsh, Brian K. Neonatal and Pediatric Respiratory Care, 5th Ed. ISBN# 9780323545945.

American Academy of Pediatrics American Heart Association. (2020). *PALS Heart Code Online PreCourse*. [PALS Heartcode](#).

Neonatal Resuscitation (NRP), 7th Ed 978-1-61002-024-4 (paper) or 978-1-61002-025-1 (electronic). Pediatric and Neonatal American Heart Association.

Please visit the [BOOKSTORE](#) online site for most current textbook information.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

### **TECHNICAL REQUIREMENTS:**

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials. Access to myHGTC portal for student self-services.

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College email access – this is the college’s primary official form of communication.

### **CLASSROOM ETIQUETTE:**

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

### **PLAGIARISM & CHEATING:**

Refer to the College catalog & Student handbook HGTC Handbook. The student may be assigned a failing grade for the course or may be required by the professor to withdraw from the course and/or the respiratory care program. Such actions are deemed to be unprofessional behavior within this program and will not be tolerated.

## **Part II: Student Learning Outcomes**

### **COURSE LEARNING OUTCOMES and ASSESSMENTS\*:**

#### Module I

Material Covered: Fetal and Neonatal Growth and Development

Fetal Lung Development Chapter 1

Antenatal Assessment and High-Risk Delivery Chapter 3

Examination and Monitoring of the Neonatal and Pediatric Patient Chapter 4

Radiographic Assessment Chapter 6

Noninvasive Monitoring in Neonatal and Pediatric Care Chapter 9

Capnography Monitoring

Transcutaneous Monitoring

Assessments:

- Homework/Quizzes/Projects/Skills
- Exam

Learning Outcomes:

1. Learn the five stages of fetal lung development and the gestational age at which they occur.
2. Explain the key steps of each stage of fetal development.
3. Identify the gestational age during which extrauterine viability occurs and explain why it cannot occur earlier.
4. Identify several conditions that lead to abnormal lung development and injury.
5. Discuss the role of the type II pneumocyte in the surfactant production.
6. Discuss the various physiological functions of surfactant.
7. Explain how fetal lung liquid differs from amniotic fluid and describe how it is cleared during and after birth.
8. Identify various high-risk conditions that may adversely affect pregnancy outcome.
9. Explain preterm labor and post-term pregnancy evaluation and management.
10. Describe the current recommendations for assisting the newborn from intrauterine to extrauterine life.

11. List steps for initial stabilization of the newborn.
12. Describe the Apgar scoring system and how and when it is performed on the newborn.
13. List criteria for determining whether an infant is large for gestational age, appropriate for gestational age, or small for gestational age.
14. List critical vital signs to be evaluated as part of the newborn's initial physical examination.
15. Describe signs of apnea.
16. Identify signs and symptoms of respiratory distress in the newborn.
17. Describe the technique for rapid identification of a pneumothorax in a newborn.
18. List the elements of a basic neurological examination in the newborn.
19. Identify and use historical and physical findings to develop a differential diagnosis of a child's respiratory condition.
20. Communicate important historical and physical findings concerning a child's respiratory condition to the health care team in a timely manner.
21. Recognize differences in radiographic positions/projections that affect the appearance of the visualized anatomy.
22. Identify normal chest structures.
23. Examine the chest radiograph for proper placement of endotracheal tubes and vascular catheters.
24. Identify the pathologies most visualized on soft tissue images of the neck.
25. List the most common causes that lead to radiographic evaluation of the newborn chest.
26. Describe how atelectasis affects the individual lobes of each lung.
27. Describe the radiographic appearance of cystic fibrosis.
28. List the complications of chest trauma and identify the placement of support devices.

## Module II

Material Covered: Neonatal Pathology

Fetal Gas Exchange and Circulation Chapter 2

Neonatal Pulmonary Disorders Chapter 22

Acute Respiratory Distress Syndrome Chapter 29

Disorders of the Pleura Chapter 32

Assessments:

- Homework/Quizzes/Projects/Skills
- Exam

Learning Outcomes:

1. Discuss the identifiable stages of heart development and explain the development of the heart chambers.
2. Name the three fetal shunts and discuss their role during fetal circulation.
3. Explain the direction of blood flow and relative vascular pressures in the placenta, umbilical vein, three fetal shunts, right-side heart chambers, left-side heart chambers, pulmonary artery, lungs, aorta, and umbilical arteries.
4. Describe the cardiac and pulmonary sequences of events that occur when transitioning from fetal to extrauterine life, including the changes in fetal shunts.
5. Identify and differentiate the causes of neonatal respiratory distress and understand the

underlying pathophysiology of each one.

9. Describe normal cardiac anatomy and blood flow in newborns.
10. Describe the normal transition from intrauterine to extrauterine blood flow.
11. Define shunt and understand the different types of shunts seen with congenital heart disease.
12. Understand the basic classification schemes for congenital cardiac defects.
13. Explain the most common congenital cardiac defects.
14. Recognize the various causes of changes in pulmonary vascular resistance.
15. Describe the importance of balancing pulmonary and systemic blood flow associated with various defects.
16. Recommend ventilator strategies commonly used with various congenital cardiac defects.
17. Recommend and understand the limitations of various types of physiological monitoring necessary for the care of patients with congenital cardiac defects.
18. Define the criteria to diagnose acute respiratory distress syndrome (ARDS).
19. Describe the pathological stages of acute respiratory distress syndrome.
20. Describe the pathophysiology of acute respiratory distress syndrome.
21. Explain the clinical approach to the management of the patient with acute respiratory distress syndrome.
23. Outline adjunct therapies in the management of ARDS.
24. Describe the normal function of the pleural space in healthy children.
26. List the causes of pneumothorax in neonates and children.
27. Recognize the causes of pleural effusions and empyema in children of all ages.
28. Discuss the principles of managing abnormal air or fluid in the pleural space in children.

### Module III

Material Covered: Pediatric Pathology

Surgical Disorders in Childhood that Affect Respiratory Care Chapter 23

Pediatric Airway Disorders and Parenchymal Lung Disease Chapter 26

Asthma Chapter 27

Assessments:

- Homework/Quizzes/Projects/Skills
- Exam

Learning Outcomes:

1. Identify and use historical and physical findings to develop a differential diagnosis of a child's respiratory condition
2. Determine the severity of a child's respiratory condition.
3. Discuss the anatomy and pathophysiology of the various congenital anomalies and surgical conditions in newborns and infants.
5. Recognize and manage an infant in distress resulting from choanal atresia or other upper airway anomalies.
6. Recognize and manage the potential sequelae of upper airway obstruction from upper airway anomalies.
7. Discuss the anatomy and pathophysiology of esophageal atresia with or without a tracheal fistula.

8. Recognize and manage the signs and symptoms of esophageal atresia with or without a tracheal fistula.
9. Discuss the development, anatomy, and pathophysiology of congenital diaphragmatic hernia.
10. Recognize and perform the steps related to emergency management of an infant in distress resulting from congenital diaphragmatic hernia.
11. Discuss the development, anatomy, and management of the problems associated with chest wall malformations.
12. Discuss the anatomy, diagnosis, and management of the infant with lung bud anomalies and pulmonary cystic malformations.
18. Identify and name upper and lower airway disorders.
19. Recognize the signs of severe or complete airway obstructions that require interventions.
20. Describe the basic intervention and recommended therapy for each of the airway disorders and parenchymal lung diseases.
21. Discuss the different types, and therefore the etiology of pneumonia.
22. Explain the pathophysiology of asthma.
23. Treat asthma from an evidence-based approach.
24. Identify the five components of asthma.
25. Explain how to improve the efficacy of the medications we use to treat asthma.

#### Module IV

Material Covered: Adolescent Populations

Oxygen Administration Chapter 10

Airway Management Chapter 13

Surfactant Replacement Therapy Chapter 14

Continuous Positive Airway Pressure Chapter 15

Administration of Gas Mixtures Chapter 18

Pharmacology Chapter 20

Assessments:

- Homework/Quizzes/Projects/Skills
- Exam

Learning Outcomes:

1. Discuss causes, clinical signs and symptoms, and evidence of hypoxemia.
2. Identify adverse physiological effects and equipment-related complications associated with oxygen administration to neonates, infants, and children.
3. Discuss the indications and contraindications for use of oxygen delivery devices in the neonatal and pediatric populations.
4. Describe the methods used to apply devices to deliver oxygen to neonates, infants, and children.
5. Identify four general indications for intubation.
6. Explain how to perform orotracheal intubation.
7. Explain how to perform nasotracheal intubation.
8. Select the correctly sized endotracheal tube for patients of different ages.
9. Describe the complications of intubation.
10. Explain how surfactant affects surface tension and improves lung function.

11. Identify disease processes associated with surfactant deficiency, dysfunction, or inactivation.
12. Discuss the delivery, benefits, and adverse effects of surfactant replacement.
13. Identify patients and disease processes that may benefit from surfactant replacement therapy.
14. Provide a brief history of the various methods used to generate CPAP in infants.
15. Describe the various physiological effects of CPAP.
16. Describe the indications/contraindications for CPAP.
17. Identify commonly used delivery systems and nasal interfaces for delivering CPAP.
18. Determine various strategies used to manage patients receiving CPAP and how these may impact outcomes.
19. Identify common complications and how they can be avoided when using CPAP.
20. Describe various weaning strategies that have been used for withdrawing CPAP in infants.
21. Describe the effects of Non-invasive Positive airway Pressure (NPPV) from CPAP on respiratory function.
22. Identify pediatric respiratory disorders responsive to a trial of NPPV.
23. Identify clinical scenarios in children not responsive to a trial of NPPV.
24. Explain the inspiratory pressure support feature of commercial bilevel pressure ventilators.
25. Discuss how adjustments in inspiratory and expiratory positive airway pressures affect respiratory function.
26. Recall the principles of interface selection to optimize the effectiveness and comfort to NPPV.
27. Discuss common complications and contraindications to NPPV.
28. Identify the basic chemical properties of nitric oxide.
29. Describe the process of smooth muscle contraction and relaxation.
30. Differentiate between intravenous vasodilators and inhaled nitric oxide regarding ventilation-perfusion matching and shunt.
31. Identify the potential side effects of inhaled nitric oxide.
32. Describe the beneficial properties of helium when used medically.
33. Describe how Heliox affects nebulizers, flow meters, and mechanical ventilators.
34. List the inhaled anesthetic agents that are commonly used to treat status asthmaticus.
35. Identify which inhaled anesthetic agents are best tolerated by mask.
36. List the physiological effects of inhaled anesthetic agents.
37. Identify the pharmacokinetic parameters that differ between pediatric and adult patients.
38. Identify any potential adverse events observed with the use of inhaled short-acting medications.
39. Explain the place in therapy of inhaled long-acting medications.
40. Explain administration issues after inhalation of corticosteroids.
41. Discuss the place in therapy of aerosolized antimicrobials used in the treatment of infectious respiratory diseases.

## Module V

Material Covered: Neonatal Resuscitation Provider and Pediatric Advanced Life Support

Assessment:

- Homework
- Skills Check
- Quiz/Test

## Learning Objectives:

1. Review Pharmacologic drugs used during Neonatal Resuscitation.
2. Recall Oxygen delivery for neonatal and newborn infants.
3. List the Neonatal Resuscitation Algorithm.
4. Perform Neonatal Resuscitation for neonatal and newborn infants.

## Part III: Grading and Assessment

### EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS\*:

Students' performance will be assessed, and the weight associated with the various measures/artifacts are listed below.

## Competency:

PALS Certification

Oxyhood Setup

Vapotherm Setup Pediatric

CPAP Setup Infant

Optiflow Junior/Hiflo setup Infant

### EVALUATION\*

Homework/Quizzes/Projects/Skills	15%
Test	60%
Final Exam	25%
	100%

## LATE ASSIGNMENTS:

1. All exams are mandatory and must be completed on date of exam. Exams cannot be made up unless for extenuating circumstances or doctors excuse is provided. Any subsequently missed exams will receive a grade of 0.
2. Makeup examinations will be taken in the [testing center](#) on campus, or a location designated by the instructor.
3. A 10 Point overall deduction will be applied to the makeup examination score for missed examinations unless faculty are notified in advance (more than 12 hours), or medical documentation is provided.
4. Final exams cannot be made up. Missing a final exam will result in a failure for the course an "F" will be given for the final grade and removal from the program.
5. The discretion of the professor will decide if an absence is excused only under this circumstance will a makeup exam be allowed.

## Lab Competency and Skill Check Assessment:

The student is required to successfully complete each skill check assessment for the course prior to the final laboratory competency practical examination or per the instructor's schedule. Two attempts can be made to pass the lab competencies and skill check. The course instructor will announce the due date of

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the skill check assessments in the course calendar informational sheet.

### Summary Performance Evaluation

The following will be used to evaluate the clinical/lab performance:

Satisfactory – Completion of first attempt (85-100%) Performed procedure accurately or was able to correct performance without injury to the patient or decreasing effect of therapy being given.

Each competency and skill check are considered a pass/fail. If a student makes less than 85% on the first attempt. The student may repeat the competency/skill check an additional time after the first attempt.

Unsatisfactory performance – Completion of first attempt (less than <85%). Requires remediation under the following categories.

- The psychomotor portion of the performance evaluation is a pass/fail grading criterion. After a student's second attempt, if the student does not pass the physical portion with an 85% or greater. Failure of the physical portion of the course will result in failure of the course.
- Failure to complete a critical skill after the second attempt within the psychomotor evaluation will also result as a failure of the course.

### **GRADING SYSTEM:**

A grade of "C" or better must be achieved in all required respiratory care program courses for a student to progress through the program. A final grade of less than 75 is not passing in the Respiratory Care Program and does not meet the requirements for progression within the program. This policy is different than the Horry Georgetown Technical College Grading Policy.

#### GRADING SCALE:

100 - 90 =	A
89 - 80 =	B
79 - 75 =	C
74 - 69 =	D
68 - 0 =	F

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

## Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student and a student may not be permitted to reenroll.

Attendance for Face-to-Face Courses:

For a 15-week course (fall and spring) the allowed number of absences for a M only class is as follows: 2 absences are allowed regardless of reason. After the allowed number of misses, the student will be dropped from the course with a W or a WF.

## Part V: Student Resources



### THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. **Academic tutors** for most subject areas, **Writing Center support**, and **college success skills**.
2. Online **tutoring** and academic support resources.
3. Professional and interpersonal communication **coaching** in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring, contact the SSTC at [sstc@hgtc.edu](mailto:sstc@hgtc.edu) or self-schedule in the Penji iOS/Android app or at [www.penjiapp.com](http://www.penjiapp.com). Email [sstc@hgtc.edu](mailto:sstc@hgtc.edu) or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the [Online Resource Center](#) to access on-demand resources.



### STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following **free** resources:

1. **Getting around HGTC:** General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. Use the [Online Resource Center \(ORC\)](#) including Office 365 support, password resets, and username information.
3. **In-person workshops, online tutorials and more services** are available in Desire2Learn, Student Portal, Degree Works, and Office 365.
4. **Chat with our staff on TECH Talk**, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552.



## **HGTC LIBRARY:**

Each campus location has a library where HGTC students, faculty, and staff may check out materials with their HGTC ID. All three HGTC campus libraries are equipped with computers to support academic research and related schoolwork; printing is available as well. Visit the [Library](#) website for more information or call (843) 349-5268.

## **STUDENT TESTING:**

Testing in an **online/hybrid** course and in **make-up exam** situations may be accomplished in a variety of ways:

- Test administered within D2L.
- Test administered in writing on paper.
- Test administered through Publisher Platforms (which may have a fee associated with the usage)

Furthermore, tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through our online proctoring service. To find out more about proctoring services, please visit the [Online Testing](#) section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

## **DISABILITY SERVICES:**

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to HGTC's [Accessibility and Disability Service webpage](#). The Accessibility and Disability Services staff will review documentation of the student's disability and, in a confidential setting with the student, engage in an interactive process to develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided. Students will need to reach out to the Accessibility and Disability Services staff each semester to renew their accommodations.

## **COUNSELING SERVICES:**

HGTC Counseling Services strives to optimize student success through managing personal and academic concerns that may interfere with achieving educational goals. Staff are available to every student for assistance and guidance on personal matters, academic concerns and other areas of concern. HGTC offers free in-person and telehealth counseling services to students. For more

information about counseling services, please reach out to [counseling@hgtc.edu](mailto:counseling@hgtc.edu) or visit the website the [Counseling Services webpage](#).

### **STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:**

Horry-Georgetown Technical College shall not discriminate in employment or personnel decisions or in student admissions or in student decisions, or in all other segments of the College community on the basis of race, color, sex, national or ethnic origin, age, religion, disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation, in the educational programs and activities which it operates, and the college is prohibited from discrimination in such manner by applicable laws. Practices and requirements for nondiscrimination extend to the enrollment of students in programs and activities of the College and employment by the College.

All inquiries regarding the federal laws as they relate to discrimination on the basis of sex may be directed to Tamatha Sells, Title IX Coordinator, Horry-Georgetown Technical College, Building 1100C, Room 107B, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5218, [tamatha.sells@hgtc.edu](mailto:tamatha.sells@hgtc.edu) or to the US Department of Education Office of Civil Rights. (Telephone: 800-421-3481/Email: [OCR@ed.gov](mailto:OCR@ed.gov)).

Other employee and applicant inquiries concerning the federal laws and their application to the College may be directed to Jacquelyne Snyder, Vice President, Human Resources and Employee Relations & the College's Affirmative Action/Equal Opportunity Officer, Horry-Georgetown Technical College, Building 200C, Room 205B, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5212, [jacquelyne.snyder@hgtc.edu](mailto:jacquelyne.snyder@hgtc.edu).

Other student and prospective student inquiries concerning the federal laws and their application to the College or any student decision may be directed to Dr. Melissa Batten, Vice President, Student Affairs, Section 504 & Title II Coordinator Horry-Georgetown Technical College, Building 1100C, Room 107A, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5228, [melissa.batten@hgtc.edu](mailto:melissa.batten@hgtc.edu).

### **TITLE IX REQUIREMENTS:**

Title IX of the Education Amendments of 1972 protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination.

HGTC prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking and will provide students, faculty, and staff with necessary information regarding prevention, policies, procedures, and resources.

Any student, or other member of the college community, who believes that they have been a victim of sexual harassment, domestic violence, dating violence, sexual assault, or stalking may file a report with the college's Title IX Coordinator or campus law enforcement\*.

\*Faculty and Staff are required to report these incidents to the Title IX Coordinator when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

For more information, contact Tamatha Sells, Title IX Coordinator, Conway Campus, Building 1100C, Room 107B, 843-349-5218, [tamatha.sells@hgtc.edu](mailto:tamatha.sells@hgtc.edu).

## **PREGNANCY ACCOMMODATIONS**

Under Title IX, colleges must not exclude a pregnant student from participating in any part of an educational program. Horry-Georgetown Technical College is committed to ensuring that pregnant students receive reasonable accommodations to ensure access to our educational programs.

Students should advise the Title IX Coordinator of a potential need for accommodations as soon as they know they are pregnant. It is extremely important that communication between student, instructors, and the Title IX Coordinator begin as soon as possible. Each situation is unique and will be addressed individually.

Title IX accommodations DO NOT apply to Financial Aid. Financial Aid regulations do not give the College any discretion in terms of Financial Aid eligibility.

Certain educational programs may have strict certification requirements or requirements mandated by outside regulatory agencies. Therefore, in some programs, the application of Title IX accommodations may be limited.

To request pregnancy accommodations, please complete the [Pregnancy Intake Form](#).