

Bergen Community College
Division of Health Professions
Respiratory Care Program

RSP-220 Fundamentals of Respiratory Critical Care

Course Information

Semester and Year:

Course and Section Number: RSP-210-001

Meeting Times and Locations:

Instructor:

Office Location:

Departmental Secretary:

Office Hours:

Contact information:

Course Description

This is a course of study of the respiratory therapists' role as a member of the critical care team. Students will be introduced to advanced management devices utilized to maintain patent airways. Students will learn interpretation of blood gases and sampling techniques. Introductory preparation to conduct therapeutic procedures needed to achieve adequate artificial ventilation with emphasis on non-invasive support and invasive support is part of this course. Students will learn procedures needed to assist a physician.

Credits: 3 (3 lectures hours)

Prerequisites: RSP-110, RSP-119, and RSP 121

Corequisites: RSP-220, RSP-222, and RSP-225

Student Learning Outcomes: As a result of meeting the requirements in this course, the student will:

1. Select artificial airways to manage a patent airway and provide positive pressure ventilation.
2. Collect and interpret arterial blood gas samples.
3. Choose an appropriate non-invasive or invasive ventilation therapy to treat respiratory failure.
4. Demonstrate procedures to assist a physician.

Means of Assessment

A student in this course is assessed through:

- Five (5) exams that contain multiple choice or calculation questions that will be used to assess competency.

- A project used to assess writing skills.

Course Content

Clinical Interpretation of Blood Gases and Sampling

1. Discuss the indications, contraindications and procedure for obtaining an arterial blood gas samples from various sites.
2. Discuss safety precautions that are necessary when obtaining an arterial sample.
3. Discuss the procedure for analyzing an arterial sample, and the interpretation of the results from the arterial blood gas sample.
4. Describe the pH/ PaCO₂/ HCO₃⁻ relationship.
5. Interpret the results from the arterial sample according to acceptable medical standards.
 - a. Respiratory acidosis
 - b. Respiratory alkalosis
 - c. Metabolic acidosis
 - d. Metabolic alkalosis
 - e. Compensated
6. Describe the potential common errors in the sampling, analysis, and interpretation of arterial blood gas assessments.

Airway Management

1. Describe how to perform endotracheal and nasotracheal suctioning.
2. Describe how to properly obtain sputum samples via artificial airways, and expectoration.
3. Describe and discuss the oropharyngeal airway, nasopharyngeal airway, and list the indications and contraindications for these devices.
4. Identify the need for and select an artificial airway:
 - a. Endotracheal airway
 - b. Nasotracheal airway
 - c. Tracheal airways
5. Identify the complications and hazards associated with insertion of artificial airways.
6. Describe how to perform orotracheal and nasotracheal intubation of an adult.
7. Discuss the significance of cuff pressure and demonstrate the procedure for obtaining cuff pressure.
8. Assess and confirm proper endotracheal tube placement.
9. Describe the rationale and the methods for performing a tracheotomy.
10. Identify the types of damage that artificial airways can cause
 - a. Laryngeal lesions
 - b. Tracheal lesions
 - c. Tracheomalacia
 - d. Tracheoesophageal fistula
11. Describe how to maintain and troubleshoot artificial airways properly.
12. Evaluate the patient for extubation readiness.
13. Discuss when and how to decannulate a patient.
14. Describe how to use alternative airway devices:
 - a. Laryngeal Mask Airway
 - b. Double-Lumen Airway

- c. Surgical Emergency Airways
- 15. Describe the process for performing a bronchoscopy and the different types of bronchoscopes.
 - a. Rigid Tube Bronchoscopy
 - b. Flexible Fiberoptic Bronchoscopy
 - c. Disposable Bronchoscope
- 16. Describe how to perform capnometry and interpret capnography.
 - a. Methods/Devices
 - b. Interpretation
 - c. Procedure
 - d. Problem-Solving and Troubleshooting

Lung Expansion Therapy/Airway Clearance Therapy (ACT)

1. Describe the various causes and factors associated with atelectasis.
2. Identify which patients need lung expansion therapy.
3. Identify the different types of lung expansion therapy.
 - a. Incentive Spirometer
 - b. Noninvasive ventilation
 - c. Intermittent Positive Airway Pressure Breathing (IPPB)
 - d. Positive Airway Pressure Therapy
4. Describe how lung expansion therapy works
5. List the indications, hazards, and complications associated with the various modes of lung expansion therapy.
6. Describe the primary responsibilities of the respiratory therapist in planning, implementing, and evaluating lung expansion therapy.
7. State the clinical indications for airway clearance therapy.
8. Describe the technique and potential benefit of each of the following:
 - a. Chest Physical Therapy
 - b. Directed Coughing and Related Expulsion Techniques
 - c. Mechanical Insufflation-Exsufflation
 - d. Positive Airway Pressure Adjuncts
 - e. High-Frequency Chest Wall Oscillation (HFCWO)
 - f. High-Frequency Positive Airway Pressure Devices
 - g. Intrapulmonary Percussive Ventilation (MetaNeb)
9. Evaluate a patient's response to airway clearance therapy.
10. Modify airway clearance therapies based on patient response.

Assisting the Physician

1. Identify the indications for thoracentesis.
2. Explain the procedure for performing and assisting the physician during thoracentesis.
3. Describe the use for ultrasound.
4. Identify the indications and contraindications for chest tube placement.
5. List the medications used for moderate sedation.
6. Explain the procedure for administration of sedative medications and reversal agents.

Non-Invasive Positive Pressure Ventilation (NIV or NIPPV)

1. List the goals and benefits of noninvasive positive pressure ventilation (NIPPV).
2. Describe the principles of operation of negative pressure ventilators
3. Discuss indications for NIPPV.
4. Discuss the types of mechanical ventilators and ventilation modes used to provide NIPPV.
5. Establish the initial settings for non-invasive ventilation.
6. Identify the types of patient interfaces available for NIPPV; selecting an appropriate interface for the patient.
7. Discuss the role of the respiratory therapist during the initial application of NIV.
8. Discuss the ongoing management of the patient on a noninvasive ventilator in the acute care setting.
9. Identify potential complications associated with NIPPV.

Invasive Positive Pressure Mechanical Ventilation

1. Discuss the goals of ventilatory support.
2. Describe how to choose an appropriate ventilator to begin ventilatory support.
3. Explain how to choose an appropriate mode of ventilation given a patient's specific condition and ventilatory requirements.
 - a. Patients with normal lungs
 - b. Patients with restrictive disorders
 - c. Patients with obstructive disorders
4. Modes:
 - a. Assist control – pressure control
 - b. Assist control – volume control
 - c. Pressure Regulated Volume Control
 - d. Synchronized intermittent mechanical ventilation
5. Identify appropriate initial ventilator settings based on patient assessment.
6. Discuss the assessment process of a patient who is on mechanical ventilation.
7. Discuss how to adjust ventilatory support based on oxygenation and ventilation status.
8. Discuss how to adjust the ventilator based on the patient's response.
9. Discuss the importance of ventilator alarms and how to adjust the alarm parameters.
10. Discuss respiratory care ventilator flow sheets for documentation of patient assessment, ventilator settings, alarms, and patient progress/weaning.

Course Texts

Required

- Kacmarek R. Egan's Fundamentals of Respiratory Care, 12th ed. Elsevier, 2021. ISBN: 9780323811217

Exam and Project Requirements

The course will consist of (5) multiple choice computerized examinations, and a written project.

The computerized exams are typically fifty questions, timed for an hour.

Grading Policy

Assessments	
Exams (5)	90%
Written Project	10%
Total points	100%

Grade Scheme

Letter	Description	% Range
A	The student must show superior theoretical knowledge.	93 – 100
B+	The student must merit high-quality classroom work and theoretical knowledge.	88 – 92.9
B	The student must show above-average knowledge.	83 – 87.9
C+	The student meets the standard of achievement with reasonable knowledge.	78 – 82.9
F	The student fails to meet minimum course standards.	<78

Missed Exams and Late Work

Late work and make-up examinations will be penalized with a grade being no greater than 78%. Late work must be submitted as soon as possible. 10% will be deducted from the total grade for every day assignment is not turned in.

Make-up examinations will be completed during the last week of the semester, or at the discretion of the professor.

Academic Integrity Policy and Attendance Policy

Academic Integrity

Academic dishonesty is a serious violation of BCC policy and personal ethics and will be treated as such if the reason for suspicion should arise. Students should be careful to avoid plagiarism, falsification, and compliance. Academic integrity is vital to an academic community and for fair evaluation of student assessments. All assessments submitted must be your own, completed in accordance with the college's academic policies and the student code of conduct. You may not engage in unauthorized collaboration or make use of any artificial intelligence (AI) composition systems. Academic dishonesty also includes cheating on examinations. Refer to the BCC student code of conduct, student handbook for additional information, and the statement on plagiarism

(<https://catalog.bergen.edu/content.php?catoid=4&navoid=163#academic-dishonesty>).

BCC Attendance Policy

All students are expected to attend punctually every scheduled meeting of each course in which they are registered. Attendance and lateness policies and sanctions are to be determined by the instructor or program policy. The instructor will keep attendance for administrative and counseling purposes. Class attendance and student participation are essential to the successful completion of this course.

Course Attendance Policy

Attendance and punctuality in all class sessions is required. Attendance for lectures is factored into the total grade for the course. Two (2) points are deducted for every absence. One (1) point is deducted if the student arrives after the attendance is recorded. If you are late, be sure to see the professor in that class so the absence can be corrected to a lateness.

Departmental Policy Statements

- Acceptable quality of work and mature behavior is always expected from every student. Students are regarded as professionals and are expected to conduct themselves accordingly.
- High standards of professional performance demand that students maintain good academic progress throughout their course of study in the program.
- Students demonstrating chronic tardiness or absenteeism will be placed on academic warning or probation and may be subjected to termination from the program.
- Absence from a class during a scheduled exam will be subject to the policy of the instructor for that specific course. If the student is going to miss a scheduled exam, it is expected that the student will contact the instructor ahead of time by email or phone to the department office.
- All students are required to adhere to the policies and procedures of the school as outlined in the college catalog.
- Additional department policies are in the Student Policies and Procedures Manual.
- Remediation
 - The program's defined process for addressing deficiencies in a student's knowledge, skills, professional behavior, and competencies so that the correction of these deficiencies can be ascertained and documented. The program must conduct these evaluations equitably and with sufficient frequency to facilitate prompt identification of learning deficiencies and the development of a means for their remediation within a suitable time frame.
 - The remediation process is initiated by faculty when any student is at risk of failing a course due to difficulty accomplishing course objectives and / or requirements. At risk behaviors include academic deficiency (non-passing quiz, examination, laboratory competency), lack of clinical competency (not abiding by policy and procedures, unsafe behavior), and lapses in professional conduct.

Support Services

- The program faculty maintains office hours for counseling and is available to provide tutorial assistance to students.
- Students must make appointments in advance to meet with the respective instructors.
- Students may also obtain assistance from the [College Tutoring Center](#). Appointments must be made in advance through this center.
- The College has a [personal counseling center](#) for those students who may need personal assistance. Appointments are made directly through this center.
- Any problems, concerns, or questions should be directed to the course instructor or the student's advisor.
- Statement on Civility

- Refer to the [Standards of Conduct](#) Subsection found in the Student Judicial Affairs Policies & Procedures Section found in the Student Handbook.
- Academic Integrity
 - Refer to the Academic Integrity Subsection; found in the [Academic Regulations](#).
- Other possible College, Divisional, or Departmental Policy Statements to be referenced.
 - ADA statement.
 - Students with documented disabilities who require accommodations by the American with Disabilities Act (ADA) can request support services from the Office of Specialized Service of Bergen Community College located in room L-115 of the Pitkin Learning Center. (www.bergen.edu/oss)
 - Sexual Harassment statement.
 - Statement on acceptable use of [BCC technology](#).
- Support Services
 - [Writing Center](#)
 - [Math Lab](#)
 - [Online Writing Lab](#) (OWL)
 - [Office of Specialized Services](#)
- BCC Library
 - The [Sidney Silverman Library](#) is committed to providing a quiet, welcoming, respectful atmosphere conducive to study and research in an environment that is comfortable, clean, and safe. The use of the library will be beneficial in providing resources on researching topic information, citation styles, and finding current articles among many other media services available.

Course Schedule

Week	Topic	Reading Assignments
1	Intro to Acid-Base; Clinical Interpretation of Blood Gases	Egan's Ch.14
2	Clinical Interpretation of Blood Gases and Sampling; Covering the Arterial Stick-Practice in Lab	Egan's Ch. 14
3	Exam 1 Competency on Arterial Stick in Lab	Egan's Ch.14
4	Intro to Airway Management	Egan's Ch. 37
5	Emergency Cardiovascular Life Support	Egan's Ch. 38
6	Lung Expansion Therapy	Egan's Ch.43
7	Exam 2 Airway Clearance Therapy	Egan's Ch.44
8	Assisting the Physician / Respiratory Failure	Egan's: Ch. 22/45
	Spring Break	
9	Exam 3 Physiology of Ventilatory Support	Egan's Ch.47
10	Intro to Non-Invasive Positive Pressure Ventilation	Egan's Ch.50
11	Non-Invasive Positive Pressure Ventilation	Egan's Ch.50
12	Exam 4 Intro to Positive Pressure Mechanical Ventilation/ Patient – Ventilator Interactions	Egan's Ch.48
13	Invasive Positive Pressure Mechanical Ventilation: Initiating and Adjusting Ventilatory Support	Egan's Ch.49
14	Invasive Positive Pressure Mechanical Ventilation; Review	Egan's Ch.49
15	Exam 5 Written project due	

Note to Students: This course schedule is subject to change depending upon the progress of the course. All material will be covered, and students are responsible for the content.