A. **COURSE DESCRIPTION**
Mechanical Ventilation I is designed to introduce the student to the design, function and operation of volume versus pressure controlled ventilators. Emphasis is placed on assisted and controlled ventilation and the use of special procedures. A detailed study of acid-base theory and interpretation of arterial blood gases, including arterial sampling.

B. **COURSE GOALS & OBJECTIVES**
Select, Review, Obtain and Interpret Data

**SETTING:** In any patient care setting, the advanced respiratory therapist reviews existing clinical data and collects or recommends obtaining additional pertinent clinical data. The therapist evaluates all data to determine the appropriateness of the prescribed respiratory care plan, and participates in the development of the respiratory care plan.

1. Review patient records and recommend diagnostic procedures for mechanically ventilated patients.
   (C5, C7, C18, F6, F8, F9)
2. Collect and evaluate clinical information for patients on mechanical ventilation.
   (C5, C9)
3. Perform bedside procedures and interpret results to determine:
   C5, C7, C9, C18, F8, F9)
   a. pulse oximetry, transcutaneous O₂/CO₂ monitoring, capnography
   b. tidal volume, minute volume, I:E
   c. blood gas analysis, P(A-a)O₂, alveolar ventilation
   d. peak flow, maximum inspiratory pressure, maximum expiratory pressure, forced vital capacity, lung compliance, lung mechanics
   e. tracheal tube cuff pressure, volume
4. Participate in development of respiratory care plans for a patient on mechanical ventilation
   (C5, C7, C9, C16, F6, F8, F9, F15, F16)
5. Select and obtain equipment appropriate to the respiratory care plan:
   a. ventilators
      1) pneumatic, electric, microprocessor, fluidic
      2) high frequency
      3) noninvasive positive pressure
6. Explain planned therapy and goals to patient in understandable terms to achieve optimal therapeutic outcome and protect patient from nosocomial infection. (C7, C10, C11, C16, F6, F13)
7. Maintain records and communications: (C7, C8, F2, F6)
   a. communicate information regarding patient’s clinical status to appropriate members of the healthcare team
   b. communicate information relevant to coordinating patient care and discharge planning (i.e., scheduling, avoiding conflicts, sequencing of therapies)
   c. apply computer technology to patient management (i.e., ventilator waveform analysis, electronic charting, patient care algorithms)
   d. communicate results of therapy and alter therapy per protocol(s)
8. Conduct therapeutic procedures to maintain a patent airway, achieve adequate ventilation and oxygenation, and remove bronchopulmonary secretions. (C19)
   a. Maintain a patent airway including the care of artificial airways
   b. Achieve adequate spontaneous and artificial ventilation:
      1) select appropriate ventilator
      2) initiate and adjust continuous mechanical ventilation when no settings are specified and when settings are specified (i.e., select appropriate tidal volume, rate, and/or minute ventilation)
      3) initiate and select appropriate settings for high frequency ventilation
      4) initiate nasal/mask ventilation, initiate and adjust external negative pressure ventilation (i.e., cuirass)
      5) initiate and adjust ventilator modes (i.e., A/C, SIMV, pressure support ventilation [PSV], pressure control ventilation [PCV])
      6) initiate and adjust independent (differential) lung ventilation
      7) administer prescribed bronchoactive agents (i.e., bronchodilators, corticosteroids, mucolytics)
      8) institute and modify weaning procedures
   c. Achieve adequate arterial and tissue oxygenation:
      1) initiate and adjust CPA, PEEP, and noninvasive positive pressure
      2) initiate and adjust combinations of ventilatory techniques (i.e., SIMV, PEEP, PS, PCV)
      3) position patient to minimize hypoxemia, administer oxygen (on or off ventilator), prevent procedure-associated hypoxemia (i.e., oxygenate before and after suctioning and equipment changes)
9. Modify mechanical ventilation based on patient response. (C5, C16, F9, F14)
   a. adjust ventilator settings (i.e., tidal volume, F\textsubscript{1}O\textsubscript{2}, inspiratory plateau, PEEP and CPAP levels, pressure support and pressure control levels, noninvasive positive pressure, alarm settings)
   b. change patient breathing circuitry, change type of ventilator
   c. measure volume loss through chest tube(s)
   d. change mechanical dead space
   e. support, T-piece trials
10. Act as an assistant to the physician performing special procedures including: (C9, F5, F6, F11, F16)
    a. bronchoscopy
b. thoracentesis  
c. transtracheal aspiration  
d. tracheostomy  
e. percutaneous needle biopsies of the lung  
f. cardioversion  
g. intubation  
h. insertion of chest tubes  
i. insertion of lines for invasive monitoring (i.e., central venous pressure, pulmonary artery catheters, Swan-Ganz, arterial lines)  
j. conscious sedation
C. **PRE-REQUISITES/CO-REQUISITES** Requires departmental approval

D. **TEXTBOOK INFORMATION**


This textbook can be purchased at the ACC bookstore, which is open Monday through Thursday 7:30 a.m. to 7:00 p.m. and Friday 7:30 a.m. to 2:00 p.m. Bookstore hours can vary during holidays so please call the bookstore at 281-756-3681 for more information. The textbook can also be purchased online and mailed directly to your residence from: [http://www.alvinccstore.com/](http://www.alvinccstore.com/)

E. **COMMUNICATING WITH YOUR INSTRUCTOR**

The preferred method of communicating with your instructor is through the ACC email or you may call/text me at 281-380-4275. Please leave your first and last name, a phone number or an e-mail address where I can contact you and explain what you need to discuss with me. I will normally respond within 24 hours Monday-Thursday and by the next business day on Friday-Sunday.

F. **CLASS ATTENDANCE POLICY**

Students are expected to attend *all* classes including clinical regularly. The student is responsible for being present and on time and for preparing adequately for each class by reading *all* assigned materials prior to class. A student who accumulates more than two (2) weeks absences in one (1) class during a sixteen-week (16) semester or an equivalent time during a six-week (6) or twelve-week (12) session may be advised to drop that course or the absences will be reflected in the final grade average. (Does not pertain to clinical absences.) Five (5) points will be deducted from the final grade average for each day of unexcused absence(s) after the accumulated two-weeks absence. (Does not pertain to clinical courses)

An unexcused absence is an absence which is not substantiated by a written doctor's excuse. These excuses do not include doctor, dentist, eye, etc., appointments. Students are held accountable for all missed work.

The student is responsible for contacting each course instructor regarding materials distributed in class, assignments made during class, and make-up assignments for any classes missed (excused or unexcused). The student will not be allowed in clinical when the student does not attend class.

G. **DISCLAIMER**

The instructor reserves the right to modify this syllabus as needed and will notify the students of any changes using the ACC e-mail or MyBlackboard e-mail or announcements

H. **CODE OF ACADEMIC INTEGRITY AND HONESTY**

Alvin Community College students are members of an institution dedicated to the pursuit of knowledge through a formalized program of instruction and learning. At the heart of this endeavor, lie the core values of academic integrity which include honesty, truth, and freedom from lies and fraud. Because personal integrity is important in all aspects of life, students at Alvin Community College are expected to conduct themselves with honesty and integrity both in and out of the classroom. Incidents of academic dishonesty will not be tolerated and students guilty of such conduct are subject to severe disciplinary measures.

I. **CLASSROOM PROTOCOL**

It is the right of each student to participate in his or her learning, and it is the responsibility of each student to not interfere with the learning of other students. It is the expectation of the college that each student assumes the responsibility to follow college policies and procedures governing campus and classroom conduct. This information is published in the ACC Student Handbook [http://www.alvincollege.edu/resources/pdfs/student_handbook.pdf](http://www.alvincollege.edu/resources/pdfs/student_handbook.pdf)
J. COURSE OUTLINE

Unit I  History of Mechanical Ventilation
          Ethics of Mechanical ventilation
          Review of:  1) Principles of Mechanical Ventilation
                       2) Airway Management

Unit II  Classification and Operating Modes of Mechanical Ventilation

Unit III Effects and Complications of Mechanical Ventilation

Unit IV  Initiation of Mechanical Ventilation

Unit V  Patient Management and Troubleshooting

Unit VI  Patient Monitoring and Pharmacotherapy

Unit VII Weaning from Mechanical Ventilation

Unit VIII Specific Ventilators

Unit IX  Arteriotomy and ABG Interpretation

K. COURSE ASSIGNMENTS & QUIZZES

Mechanical Ventilation Laboratory Book
There will be a laboratory book due towards the end of the semester. The student is responsible for completing the laboratory assignment on their own time. The student will show their work for calculations and must use the proper units. One half (1/2) point will be deducted from the assignment for every answer in which the student does not show their work or use the proper units. No credit will be given for any essay answer that resembles another. If two essay answers look alike, neither student will receive credit for that answer.

During the Spring semester, each student will be required to attend 24 hours in Open Lab. Open lab will be held twice each week and during the open lab the student must work on improving their mechanical ventilation skills. An instructor will be present and must sign their Open Lab Verification Form. Attendance at Open Lab is mandatory. If the hours are not completed by the end of the semester, the student will receive an incomplete and five (5) points will be deducted from the student’s final grade.

Each student will be required to pass a preliminary check-off supervised by a senior student before they will be allowed to attempt the check-off with an instructor. Documentation must be presented to the instructor prior to attempting the check-off.

COMPUTER ASSIGNMENT
There will be a computer program for arterial blood gases that will be completed by each student. The program is in the computer labs in the S-building. The completion date will be announced in class. Once the program is completed, the student will print their score. If the program will not print out your score, please have a faculty member or department secretary verify and sign the scores.

Arterial Blood Gases I (Medical Educational Software)

ETHICS PAPER ASSIGNMENT
After reading the book, Bed Number Ten, you will be required to write a paper regarding the book. The paper must be typewritten and at least three (3) pages in length. In your paper, you need to address the following:

1.  Cite examples of unprofessional/unethical behavior on the part of the health care professionals.
2.  How serious a problem do you think this is OR is there a problem with this type of behavior in the health care community?
3.  How do you anticipate dealing with unprofessional/unethical behavior in the hospital setting?
4.  What measures would you suggest to prevent this type of behavior in other health care professionals?
5.  What conclusions can you make from reading this book?

THE PAPER IS DUE ON FRIDAY, JANUARY 30, 2015
The book must be turned in with the paper. A grade of “0” will be given if the book is not returned.

L. LATE COURSE WORK POLICY
All assignments are to be completed and turned in on the date specified in class. Five (5) points will be deducted from each assignment for every scheduled class-day that the assignment is late. Students will be granted one (1) late assignment for illness (per course) provided the student notifies the instructor prior to class.

M. EXAM POLICY
Students may miss one (1) unit examination which must be made up on the date of return, prior to the scheduled class, ONLY if the student has an EXCUSED ABSENCE. In the event of an unexcused absence, no make-up exam will be given. The highest score that the student will receive on the make-up exam is a “75”. Only one make-up will be given for this course. All make-up exams, whether taken early or after the assigned test day, will be essay exams.

N. GRADING SUMMARY

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<tr>
<th>Component</th>
<th>% of final grade</th>
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<tr>
<td>Unit I</td>
<td>5%</td>
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<td>Unit II</td>
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<td>Unit III</td>
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<td>Unit VIII</td>
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<td>Unit IX</td>
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<tr>
<td>Final Exam</td>
<td>10%</td>
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<tr>
<td>Ethics paper</td>
<td>5%</td>
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<tr>
<td>Check-offs</td>
<td>5%</td>
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<tr>
<td>Lab Manual, quizzes, assignments</td>
<td>5%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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<tr>
<th>Percent</th>
<th>Grade</th>
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<tr>
<td>90-100</td>
<td>A</td>
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<td>80-89</td>
<td>B</td>
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<td>75-79</td>
<td>C</td>
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<tr>
<td>Below 75</td>
<td>F</td>
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The final grade is based on the average received on all course assignments and activities. The student must have a passing test average to pass the class. If the test average is less than 75, the student will not pass, even if the overall average is 75. Always communicate with your instructor if you are concerned with your grades or your overall status in the class. Each student must demonstrate 100% proficiency with each ventilator that is required for check-off. Original check-off 95%
First re-test 85%
Second re-test 75%
If the student does not successfully complete a check-off by the second re-test, he/she may be dropped from the class and will be required to repeat the course.

All check-offs will be done on a time schedule set by each student and the instructor. The student must be checked off by a set deadline. If the student is not checked off by the deadline, he/she will be dropped from the class.

I......Incomplete. No Incompletes or “I” grades will be given except for extreme circumstances. If an “I” grade is assigned and the course work is not completed by the pre-arranged time limit, this grade will convert to an “F”.

W......Withdrawal. It is recommended that the student talk to the instructor before withdrawing. Current course withdrawal information can be found in the printed version of the ACC Schedule for this semester or online at ACC Course Withdrawal Instructions. Students who file withdrawal requests by the published deadline and have not exceeded the withdrawal maximum will receive a grade of W.
O. ACADEMIC SUCCESS AND SUPPORT SERVICES:

Americans with Disabilities Act
ACC complies with ADA and 504 Federal guidelines by affording equal access to individuals who are seeking an education. Students who have a disability and would like classroom accommodations must register first with the Office of Disability Services, A 136, (281)756-3533. Instructors are not able to provide accommodations until the proper process has been followed.

Behavioral Intervention Team (BIT) – Letting someone know
The Behavioral Intervention Team (BIT) at Alvin Community College is committed to improving community safety. College faculty, staff, students and community members may communicate safety concerns to the BIT team by email, bitcore@alvincollege.edu or through an electronic reporting option located on the BIT page of the college website.

The ACC Library is an excellent source for research and writing help. Quiet rooms are available for studying and doing class work. For more information, visit the ACC Library Website or call 281-756-3559.

The ACC Tutoring/Learning Lab, located upstairs in building A, provides students with a variety of services including tutoring (math, writing, and other disciplines); computers and printers; a testing facility; and tables/carrels. Call 281-756-3566 or visit the ACC Tutoring/Learning Lab Website for more information.

MyBlackboard
Support for MYBlackboard can be obtained by completing the Online Support Form.

WEBACCESS, Passwords or ACC Computer Lab Information - Help Desk Website or contact the IT Dept. Help Desk at 281-756-3544.
### Resources
- C1 - Allocates Time
- C2 - Allocates Money
- C3 - Allocates Material & Facility Resources
- C4 - Allocates Human Resources

### Information
- C5 - Acquires and Evaluates Information
- C6 - Organizes and Maintains Information
- C7 - Interprets and Communicates Information
- C8 - Uses Computers to Process Information

### Interpersonal
- C9 - Participates as a Member of a Team
- C10 - Teaches Others
- C11 - Serves Clients/customers
- C12 - Exercises Leadership
- C13 - Negotiates to Arrive at a Decision
- C14 - Works with Cultural Diversity

### Systems
- C15 - Understands Systems
- C16 - Monitors and corrects Performance
- C17 - Improves and Designs Systems

### Technology
- C18 - Selects Technology
- C19 - Applies Technology to Task
- C20 - Maintains and Troubleshoots Technology

### Basic Skills
- F1 - Reading
- F2 - Writing
- F3 - Arithmetic
- F4 - Mathematics
- F5 - Listening
- F6 - Speaking
- F7 - Creative thinking
- F8 - Decision Making
- F9 - Problem Solving
- F10 - Seeing Things in the Mind’s eye
- F11 - Knowing How to Learn
- F12 – Reasoning

### Personal Qualities
- F13 - Responsibility
- F14 - Self-Esteem
- F15 - Social
- F16 - Self-Management
- F17 - Integrity/Honesty