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| **PROFESSOR:**  Jean Newberry / Shawn Gilmartin | **PHONE NUMBER:**  239.432.7356 |
| **OFFICE LOCATION:**  A-117 | **E-MAIL:**  jean.newberry@fsw.edu |
| **OFFICE HOURS:**  see below | **SEMESTER:**  Spring 2017 |

1. **COURSE NUMBER AND TITLE, CATALOG DESCRIPTION, CREDITS:**

**RET 2264C ADVANCED MECHANICAL VENTILATION (6 CREDITS)**

In this course, the student will learn the advanced theory and application of techniques for artificial mechanical ventilation, as well as ancillary forms of patient monitoring. The continued development of the application of the various modes of mechanical ventilation and their graphical analysis and ventilator synchrony are key concepts for the learner. The laboratory will demonstrate the clinical concepts and applications to specific ventilator modes as well as ventilator types, used in the Southwest Florida clinical affiliates. The physiological and realistic formats for mechanical ventilation will be consistently contrasted throughout the course. This content, for this course, comprises the single greatest emphasis on the National Board Exams.

1. **PREREQUISITES FOR THIS COURSE:**

RET 2234C

**CO-REQUISITES FOR THIS COURSE:**

RET 2875L, RET 2295

1. **GENERAL COURSE INFORMATION:** Topic Outline.

This course is designed to facilitate learning related to the classification and best practices for mechanical ventilators Topics of discussion include:

* History of mechanical ventilation,
* Advanced steps in ABG evaluation for the management of ventilation
* Establishing the need for mechanical ventilation.
* Basics of ventilator graphics.
* Physiologic effects and complications of positive pressure ventilation.
* Physical aspects and limitations of mechanical ventilation.
* Noninvasive and Invasive monitoring of mechanically ventilated patients.
* Selecting initial parameters and settings.
* Special issues related to ventilator setup.
* Basic patient assessment and methods to improve ventilation
* Methods to improve oxygenation
* Artificial airways, circuits, medication delivery and patient positioning during mechanical ventilation
* Problems and troubleshooting the patient –ventilator system
* Weaning and discontinuation of mechanical ventilation
* Hemo-dynamic monitoring during mechanical ventilation
* Neonatal and pediatric ventilation
* Mechanical ventilation in long term care settings & the patient’s home setting

1. **All courses at Florida SouthWestern State College contribute to the general education program by meeting one or more of the following general education competencies:**

**C**ommunicate clearly in a variety of modes and media.

**R**esearch and examine academic and non-academic information, resources, and evidence.

**E**valuate and utilize mathematical principles, technology, scientific and quantitative data.

**A**nalyze and create individual and collaborative works of art, literature, and performance.

**T**hink critically about questions to yield meaning and value.

**I**nvestigate and engage in the transdisciplinary applications of research, learning, and knowledge.

**V**isualize and engage the world from different historical, social, religious, and cultural approaches.

**E**ngage meanings of active citizenship in one’s community, nation, and the world.

**A.**  **General Education Competencies and Course Outcomes**

1. Listed here are the course outcomes/objectives assessed in this course which play an integral part in contributing to the student’s general education along with the general education competency it supports.

General Education Competency: **Think**

Course Outcomes or Objectives Supporting the General Education Competency Selected:

* Demonstrate an advanced expertise for Mechanical Ventilators including; indications, contraindications, mode of operation, initial set up and timing of the I:E relationships.
* Demonstrate advanced expertise for monitoring and discontinuation of mechanical support.

**2.  Listed here are the course outcomes/objectives assessed in this course which play a *supplemental* role in contributing to the student’s general education along with the general education competency it supports.**

General Education Competency: **Evaluate**

Course Outcomes or Objectives Supporting the General Education Competency Selected:

* Demonstrate understanding of the diagnosis and treatment of various life threatening & emergency conditions that result concurrent with or due to mechanical ventilation

1. **DISTRICT-WIDE POLICIES:**

**Programs for Students with Disabilities**

Florida SouthWestern State College, in accordance with the Americans with Disabilities Act and the College’s guiding principles, offers students with documented disabilities programs to equalize access to the educational process. Students needing to request an accommodation in this class due to a disability, or who suspect that their academic performance is affected by a disability should contact the Office of Adaptive Services at the nearest campus. The office locations and telephone numbers for the Office of Adaptive Services at each campus can be found at <http://www.fsw.edu/adaptiveservices>.

**REPORTING TITLE IX VIOLATIONS**

Florida SouthWestern State College, in accordance with Title IX and the Violence Against Women Act, has established a set of procedures for reporting and investigating Title IX violations including sexual misconduct.  Students who need to report an incident or need to receive support regarding an incident should contact the Equity Officer at [equity@fsw.edu](mailto:equity@fsw.edu).  Incoming students are encouraged to participate in the Sexual Violence Prevention training offered online.  Additional information and resources can be found on the College’s website at <http://www.fsw.edu/sexualassault>.

1. **REQUIREMENTS FOR THE STUDENTS:**

Weekly lecture, lab activities and online resources will be integrated to provide multiple resources

Targeted Technical Course Outcomes

Upon completion of this course the student will be able:

1) Classify mechanical breath delivery in all commonly used Ventilator Modes

2) Differentiate between pressure targeted and volume targeted ventilation.

3) Perform ventilator management to include patient assessment, patient monitoring and management, ventilator trouble-shooting, equipment maintenance and patient weaning.

4) Evaluate critical care monitoring techniques in mechanically ventilated patients

5) Review placement, maintenance, and securing a patient airway when mechanical ventilation is anticipated or ongoing.

6) Demonstrate, use, and discuss various modalities of ventilator adjuncts such as mask CPAP, BIPAP and other forms of noninvasive ventilation.

7) Assess patients for the physiological effects of positive pressure ventilation.

8) Perform and evaluate tracheal suctioning during mechanical ventilation with a focus on preventing VAP.

9) Measure and evaluate respiratory mechanics.

10) Identify and differentiate the methods of volume delivery used by current ventilators so that you can optimally match a particular ventilator to a variety of patient conditions.

11) Analyze and appraise microprocessor ventilators by contrasting their measured and/or diagrammatic functions against the operations of purely mechanical ventilators discussed in class, thereby evaluating each ventilator’s unique patient applicability.

12) Correctly identify and assess the particular care needs of, and hazards to, patients undergoing mechanical ventilation.

13) Develop and apply strategies or therapies to correct problem situations and accurately monitor patient/machine parameters important in safe patient care.

14) Formulate a weaning plan to aid the patient during the discontinuance of mechanical ventilation.

15) Use or modify existing equipment to accommodate modes and adjuncts to mechanical ventilation such as Volume Control (VCV), Pressure Control (PCV), Positive End Expiratory Pressure (PEEP), NAVA, Intermittent Mandatory Ventilation (IMV & SIMV), Constant Positive Airway Pressure (CPAP), Pressure Support Ventilation (PSV) as well as Dual or Multi-mode ventilation (PRVC, APRV, Autoflow, MMV etc.)

16) Demonstrate correct techniques for monitoring modalities listed in number 15 above.

17) Demonstrate the ability to perform and calculate compliance studies.

18) Recognize normal airway resistance (Raw) & conditions that increase Raw.

19) Recognize normal lung compliance and conditions that change lung compliance and make appropriate ventilator adjustments

Legacy and Critical Care ventilators available for study in Clinic and/or in the lab:

1. PURITAN BENNETT PB 840

2. Servo i

3. Bear1000

4. Dräger Evita 2 , XL and Sabina

5. Respironics V 60

6. Selected home care, transport and high frequency ventilators TBA.

1. **ATTENDANCE POLICY:**

Attendance is essential. Any unexcused time missed from class discussion or laboratory activities will result in a grade of 0 for that activity.

Lab Assignments are done on Canvas unless otherwise specified. The Lab session will be open for limited time.

Alternative access to course content is available via the Canvas site set up for this course. A missed exam or lab activity will result in a grade of 0 for that portion of the final grade unless prior alternative arrangements are made with Prof. Newberry.

1. **GRADING POLICY:**

93 - 100 = A

85 -92 = B

75 - 84 = C

68 -74 = D

Below 68 = F

(Note: The “incomplete” grade [“I”] should be given only when unusual circumstances warrant. An “incomplete” is not a substitute for a “D,” “F,” or “W.” Refer to the policy on “incomplete grades.)

**Grading**  - Written Exams …………………………………….. 50%

Top Ten Reviews/ Class / lab Participation.....…. 5%

Ventilator Case Study…………………………… 10%

Laboratory Quiz and Assignments…........... 10%

**Final Exam \*\*.**..................................…................ 25%

**\*\*A passing grade on the final exam is required to pass the course.**

1. **REQUIRED COURSE MATERIALS:**

Pilbeam’s Mechanical Ventilation, (2012) 6th Ed., Cairo,

ISBN 9780323072076

Recommended:

Pilbeam’s Mechanical Ventilation: Physiological & Clinical Applications Workbook, 6th Ed., ISBN 978032303296

1. **RESERVED MATERIALS FOR THE COURSE:**

NONE. Any other materials needed will be provided on Canvas site

1. **CLASS SCHEDULE:**

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| **Date** | **Readings** | **Lecture** | **Lab** |
| Jan 10 | (Ch 1, 2 and 3,)  Egan’s Ch 10,42,43 | Course Outline  Review of spontaneous and Mechanical ventilation; Principals of MV; Positive Pressure ventilation and breath delivery concepts | History of Mech. Ventilator;  Build a ventilator |
| Jan 17 | (Ch 4, 5) | Ventilator Modes  Arterial Lines  Circuits / ventilator set-up | Arterial Line Draw practice; Ventilator interface  Set up ventilator / circuits |
| Jan 24 | (Ch 6, 7, 8, 18)  Egan’s Ch 41 | Establishing the need for MV;  Initial Ventilator Parameters & Settings;  Safety and Alarms | A-Line practice and sign-off  Safety Settings  Jeopardy Review |
| Jan 31 | (Ch 4,19)  Egan’s Ch 45 | **Exam 1;**  Key Assessments for the NIV Patient [ER DVD] | NIV techniques  A-Lines check-off/practice |
| Feb 7 | (Ch 13)  Egan’s Ch 44 | Exam 1 Review*;*  Monitoring ventilation/improving oxygenation/ making changes | A-Lines check-off  Scenarios |
| Feb 14 | (Ch 20)  Egan’s Ch 47 | Ventilator Liberation | SIMV / PS lab |
| Feb 21 | (Ch 9, 88-90,  129-130) | Graphics; | graphics |
| Feb 28 | (Ch 9, 18, 23) | Graphics, part 2 (troubleshooting)  APRV, PRVC, NAVA | Trouble shooting |
| Mar 7 |  | **SPRING BREAK** |  |
| Mar 14 | (Ch 11, 16, 17);  Egan’s Ch 46 | HFOV--Pediatric Ventilation revisited, HFPPV and Oscillation for Adults;open lung/ARDS | APRV/PRVC |
| Mar 21 | (Ch 10,15) | **Exam 2**  Pharmacology | Oscillation and HPPV Ventilator Workshop at HP |
| Mar 28 | (Ch 22, 23) | Open Lung; lung recruitment continued  Guest Lecturre |  |
| Apr 4 |  | Integration of Basic Hemodynamic Monitoring & M.V. Effects on hemodynamics and physiology, Optimal PEEP | Simulations  Chest tube |
| Apr 11 | (ch 21) | *Barotrauma; Hazards of ventilation* | Simulations |
| Apr 18 | (Ch. 20,21 | **Exam 3**  Review for finals | **M.V. Case Study Presentations** |
| Apr 25 |  | Long Term Ventilation / end of life issue  *Millennium* | **M.V. Case Study Presentations** |
| May 2 |  | **Final** |  |

1. **ANY OTHER INFORMATION OR CLASS PROCEDURES OR POLICIES:**

Class Rules: See Respiratory Care Student Handbook.

**Professor: Jean Newberry**

**Florida SouthWestern State College**

**FACULTY CLASS SCHEDULE AND OFFICE HOURS**

**Spring, 2017**

**Class Schedule and Office Hours**

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| --- | --- | --- | --- | --- |
| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| **OFFICE HOURS**  **8:30-11:30 am**  **1:00-4:00 pm** | **CLASS**  **8:30-11:50am**  **1:00-4:00pm**  **RET 2264C**  **Advanced Mechanical ventilation**  **A-202 / A-214** | **OFFICE HOURS**  **8:30-11:00 am**  **CLASS**  **1:00-4:00pm**  **RET 2264C**  **Advanced Mechanical ventilation**  **A-214** | **OFFICE HOURS**  **8:30-11:30 am**  **1:00-4:00 pm** | **OFFICE HOURS**  **By appointment** |