Chemistry and Physics of Anesthesia  
NUR 879 - Section 001  
3 Credits  
Thursday, 8:30 a.m. – 11:20 a.m.  
Spring 2015

Catalog Course Description: Basic chemistry and physics and their relationship to nurse anesthesia practice. Organic and biochemical principles and pharmacological significance. Integration and application of these principles to nurse anesthesia practice.

Additional Course Description: NUR 886 – Clinical opportunity for intermediate student nurse anesthetists to incorporate and integrate knowledge, skills and objectives to a more comprehensive range of patients in a simulated or clinical patient environment.

Course Objectives: At the end of this course, students will:

1. Integrate basic chemical and physical principles into their understanding of basic metabolic pathways.
2. Describe and demonstrate the principles of medical mathematics.
3. Synthesize knowledge of chemical and physical relations into anesthesia practice.
4. Apply principles of chemistry and physics to anesthesia gas delivery and scavenging systems.

Prerequisites: Acceptance into the Nurse Anesthesia Program

Co-requisites: None.

Professional Standards & Guidelines: The curriculum is guided by the following documents:


Clinical Faculty: Henry Talley, PhD, CRNA, MSN, MS, BA

Contact Information:
Office: A119 Life Sciences Building  
Office Phone: 517-355-8305  
E-mail: henry.talley@hc.msu.edu  
Office Hours: 7:30 a.m. – 2:00 p.m.  
Note: Times will try to be arranged to accommodate student schedules.
Instruction:

**a. Methodology:** As adult learners, it is expected that students will do relevant reading and study prior to class on topic areas identified. Faculty directed readings and web links will be provided for specific content areas when needed. If a number of years have passed since these types of courses were taken, it would be wise to review basic textbooks. It is the student responsibility to review this material as it serves as a foundation for this graduate level course. Faculty will provide additional activities to individual students as needed in order to assist in student competency development. Guidelines for class interactions and specific methodology are located on D2L, Course Information.

There are a number of different learning modalities in this course including Independent study, classroom activities, lectures, assignments, exams, internet assignments (http://capnography.com/), self-evaluation, computer-aided instruction and student/faculty conferences.

On the first day of class it is important to understand that everyone starts with a 0.0 in all courses. You are provided with the materials to achieve passing the course; it is up to the individual to determine how they are going to reach the desired overall score/grade.

- Motivation and attitude determines, directs, and sustains what the student will learn. Motivation plays a critical role in guiding the direction, intensity, persistence, and quality of learning behaviors and course engagement that occurs.
- The ability to follow directions demonstrates the skill of precision and being informed related to critical thinking and decision-making skills.

**b. Required Texts:**


**c. Optional Texts:**


**d. Required Resources, References, Supplies:**

*MSU Technology Assistance*

D2L Help Line
1.800.500.1554 (24 hrs, 7 days/week)
517.355.2345 (24 hrs, 7 days/week)
Always check with the Technology Help Line first!
Evaluation:

a. Learning Assessments and Grading:
   Student progress will be evaluated by examinations. Exams are multiple choices and will be
   administered during the normal class period at the beginning of class on the day of examination.
   Exams are not cumulative. Exams will be weighted as follows to calculate the final course grade:

<table>
<thead>
<tr>
<th>Quiz/Examination</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz 1</td>
<td>10%</td>
</tr>
<tr>
<td>Quiz 2</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm Examination</td>
<td>20%</td>
</tr>
<tr>
<td>Quiz 3</td>
<td>10%</td>
</tr>
<tr>
<td>Quiz 4</td>
<td>10%</td>
</tr>
<tr>
<td>Final Examination (Cumulative)</td>
<td>30%</td>
</tr>
<tr>
<td>Assignments</td>
<td>10%</td>
</tr>
</tbody>
</table>

b. Course Grading Scale:

   Student progress will be evaluated by examinations. Exams are multiple choices and will be
   administered during the normal class period at the beginning of class on the day of examination.
   Mid-term and Final exams are cumulative.

   The following grading scale will be used in this class:

<table>
<thead>
<tr>
<th>%</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>94 – 100</td>
<td>4.0</td>
</tr>
<tr>
<td>87 – 93</td>
<td>3.5</td>
</tr>
<tr>
<td>80 – 86</td>
<td>3.0</td>
</tr>
<tr>
<td>(Minimum passing grade)</td>
<td></td>
</tr>
<tr>
<td>75 – 79</td>
<td>2.5</td>
</tr>
<tr>
<td>70 – 74</td>
<td>2.0</td>
</tr>
<tr>
<td>65 – 69</td>
<td>1.5</td>
</tr>
<tr>
<td>60 – 64</td>
<td>1.0</td>
</tr>
<tr>
<td>Below 60</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Professionalism:

A. General Statement
   The student is held accountable and responsible for the all policies in the most current version of The
   Michigan State University Student Handbook and Resources Guide (The Spartan Life:
   (http://nursing.msu.edu), and the Nurse Anesthesia Program Supplement.

B. Progression in the Major
   NUR 879 is a required course in the nurse anesthesia curriculum. In order to progress, a student must
   pass this course with a grade of 3.0.

C. Change in Calendar
   The faculty reserves the right to alter the calendar as circumstances may dictate. All changes will be
   announced in class, posted on the College of Nursing website, or via College of Nursing email.
   Students not present in class are responsible for obtaining this information.
D. Official Means of Written Communication—Electronic Mail

Keeping up with changes or news from Michigan State University and the College of Nursing is the responsibility of the student. Electronic mail or e-mail is an official means of written communication for all students, faculty, and staff.

University & College Policies:

The College of Nursing expects that students will demonstrate professional behavior in all situations. Specific expectations for clinical and other professional venues can be found in the appropriate handbook. You are responsible to review and act in accordance with the policies and procedures found in the following sources, including the following topics: Professionalism, Academic Integrity, Accommodations for Students with Disabilities, Disruptive Behavior, Attendance, Compliance, and Progression.

- CON Student handbook  http://nursing.msu.edu/handbooks.asp
- Information for Current Students—including Rights, Responsibilities and Regulations for Students  http://www.msu.edu/current/index.html

Policies:

Academic Integrity: Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the (insert name of unit offering course) adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades; the all-University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. (See Spartan Life: Student Handbook and Resource Guide and/or the MSU Web site: www.msu.edu). Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, lab work, quizzes, tests and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use the www.allmsu.com Web site to complete any course work in NUR 886. Students who violate MSU rules may receive a penalty grade, including--but not limited to--a failing grade on the assignment or in the course. Contact your instructor if you are unsure about the appropriateness of your course work. (See also  http://www.msu.edu/unit/ombud/honestylinks.html )

Accommodations for Students with Disabilities: Students with disabilities should contact the Resource Center for Persons with Disabilities to establish reasonable accommodations. For an appointment with a disability specialist, call 353-9642 (voice), 355-1293 (TTY), or visit MyProfile.rcpd.msu.edu.

Disruptive Behavior: Article 2.3.5 of the Academic Freedom Report (AFR) for students at Michigan State University states: "The student's behavior in the classroom shall be conducive to the teaching and learning process for all concerned." Article 2.3.10 of the AFR states that "The student has a right to scholarly relationships with faculty based on mutual trust and civility." General Student Regulation 5.02 states: "No student shall interfere with the functions and services of the University (for example, but not limited to, classes) such that the function or service is obstructed or disrupted. Students whose conduct adversely affects the learning environment in this classroom may be subject to disciplinary action through the Student Faculty Judiciary process.

Attendance: Students whose names do not appear on the official class list for this course may not attend this class. Students who fail to attend the first four class sessions or class by the fifth day of the semester, whichever occurs first, may be dropped from the course.
### Course Calendar:
(date of final examination, scheduled according to the University final exam schedule, and tentative dates of required assignments, quizzes, and tests, if applicable)

<table>
<thead>
<tr>
<th>Modules</th>
<th>Content/Topic</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation to Syllabus and Review of Basic Chemistry and Measurements</td>
<td>Talley</td>
</tr>
<tr>
<td>2</td>
<td>Review of Basic Physics: Force, Pressure</td>
<td>Talley</td>
</tr>
<tr>
<td>3</td>
<td>Review of Basic Physics: Work, Energy and Power</td>
<td>Talley</td>
</tr>
<tr>
<td>4</td>
<td>QUIZ 1</td>
<td>Talley</td>
</tr>
<tr>
<td>5</td>
<td>Fluids and Fluid Dynamics</td>
<td>Talley</td>
</tr>
<tr>
<td>6</td>
<td>States of Matter and Changes of State</td>
<td>Talley</td>
</tr>
<tr>
<td>7</td>
<td>Solutions and their Behavior</td>
<td>Talley</td>
</tr>
<tr>
<td>8</td>
<td>QUIZ 2</td>
<td>Talley</td>
</tr>
<tr>
<td></td>
<td>Acids, Bases, and Buffers</td>
<td>Talley</td>
</tr>
</tbody>
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**MIDTERM EXAMINATION**

<table>
<thead>
<tr>
<th>3/9 – 3/13 – 2015</th>
<th>SPRING BREAK</th>
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<tbody>
<tr>
<td>9</td>
<td>Classes of Organic Compounds</td>
</tr>
<tr>
<td>10</td>
<td>Biochemistry (Part I)</td>
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<tr>
<td>11</td>
<td>QUIZ 3</td>
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<tr>
<td>12</td>
<td>Biochemistry (Part II)</td>
</tr>
<tr>
<td>13</td>
<td>Electricity and Electrical Safety</td>
</tr>
<tr>
<td>14</td>
<td>Radiation, and Radiation Safety</td>
</tr>
<tr>
<td>15</td>
<td>QUIZ 4</td>
</tr>
<tr>
<td>16</td>
<td>Anesthetic drug delivery systems</td>
</tr>
<tr>
<td></td>
<td>Patient monitoring: Assessment of awareness and depth of anesthesia</td>
</tr>
<tr>
<td></td>
<td>Physics of patient monitoring; analysis of anesthetic gases and vapors</td>
</tr>
</tbody>
</table>

**WRAP UP SUMMARY**

<table>
<thead>
<tr>
<th>5/4 – 5/8 – 2015</th>
<th>FINAL</th>
</tr>
</thead>
</table>
Appeal of Test Question

All inquiries/appeals concerning a disputed answer on an examination must be made on this form. No appeal will be accepted unless received within five (5) days of the examination. All appeals will be evaluated individually.

Student Name: _______________________________________________________

Exam Number: _________ Date of Exam: _________ Date Submitted: _________

Submitted to: _________________________________________________________

1. Write the test number and question as it was written on the exam.

   _________________________________________________________________

1. What was the correct answer according to the test key? __________________

2. What answer did you select? _______________________________________

3. What concern do you have regarding the question and answer?

   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________

4. Cite Three References that support your rationale for the answer you selected over the answer on the answer key. References cannot be cited from the internet.
   a. __________________________________________________________________
   b. __________________________________________________________________
   c. __________________________________________________________________

Additional comments may be attached to this form.

Faculty Response to Appeal: Accept ________ Reject _________

Rationale:

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

Faculty Signature: __________________________ Date: ________________