Anesthesia Physiology & Pathophysiology
NUR 877, 3 Credits
Mondays, 8:00 – 10:50 am, Room A-107 Life Sciences
Spring 2010

Catalog Course Description: Physiological principles and pathophysiological relationships of body systems. Evaluation of co-existing pathophysiology.

Course Objectives: At the completion of this course the student will be able to:

1. Analyze the basic physiologic and pathological concepts most relevant to clinical applications for the advances practice anesthesia nurse.
2. Synthesize knowledge of human physiology and pathophysiology to understanding the structure-function relationships of human system.
3. Integrate physiologic and pathophysiologic principles and relationships to develop basic nurse anesthesia management strategies for maintaining homeostasis.

Prerequisites: Acceptance into the Nurse Anesthesia Program

Co-requisites: None

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


Faculty Contact Information:

Gayle Loniewski, BSN, MS, CRNA
gayle.loniewski@hc.msu.edu
Office: 517-432-8163
121 Life Sciences

Office Hours: Variable – Appointments arranged usually; however, available as needed by students in the Nurse Anesthesia Program to accommodate student schedules.
Instruction:

a. Methodology: Classroom discussion, lectures, weekly anesthesia related assignments, textbook readings, exams, self-evaluation and student/faculty conferences.

b. Required Texts


c. Optional Texts:


d. Required Resources, References, Supplies:

ANGEL Help Line
1.800.500.1554 (24 hrs, 7 days/week)
517.355.2345 (24 hrs, 7 days/week)
[www.angel.msu.edu](http://www.angel.msu.edu) (ANGEL Help link in upper right corner)
Always check with the ANGEL Help Line first!
e. Course Grade Requirements

Student progress will be evaluated by examinations. Exams are multiple choice 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>

**Exams:** There will be 3 exams, 1 cumulative final exam and weekly assignment worksheets. The grading is weighted as follows:

<table>
<thead>
<tr>
<th>Exam / Assignment</th>
<th>Weighted %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>20%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>20%</td>
</tr>
<tr>
<td>Exam 3</td>
<td>20%</td>
</tr>
<tr>
<td>Cumulative Final</td>
<td>30%</td>
</tr>
<tr>
<td>Weekly Assignment Worksheets</td>
<td>10%</td>
</tr>
</tbody>
</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.

____________________________________________________________________

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

3. What answer did you select? _________________________________________

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

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

5. 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: __________________

MSU is an Affirmative Action/Equal Opportunity Institution
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 for reviewing and acting 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
- MSU Spartan Life Student Handbook and Resource Guide
  http://www.vps.msu.edu/SpLife/index.htm
- Information for Current Students—including Rights, Responsibilities and Regulations for Students http://www.msu.edu/current/index.html
- Academic Programs http://www.reg.msu.edu/UCC/AcademicPrograms.asp
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Additional Course Content

Additional Course Description: NUR 877 is a graduate level course designed to provide the nurse anesthesia students a conceptual basis for understanding the physiological principles and pathophysiological relationships of body systems. The basic principles of human anatomy, physiology, and pathophysiology will be emphasized within the context of nurse anesthesia practice.

Additional Course Objectives: At the completion of this course the student will be able to:

1. Discuss the basic tenets of Cell Theory.
2. Identify components of DNA and RNA replication.
3. Discuss disease processes associated with heredity that impact nurse anesthesia practice.
4. Analyze the basic physiologic and pathological concepts most relevant to clinical applications for the advanced practice anesthesia nurse.
5. Discuss the mechanisms of neuron and synaptic transmission.
6. Discuss the mechanism of skeletal muscle transmission and the function of the neuromuscular junction.
7. Identify pathological conditions that impact the neuromuscular junction.
8. Differentiate skeletal muscle physiology from cardiac and smooth muscle physiology.
9. Describe the neural and hormonal control of cardiac and smooth muscle construction.
10. Interpret hemodynamic parameters and graph depictions of cardiovascular parameters.
11. Discuss pathological conditions of the cardiovascular system and identify key anesthetic implications.
12. Discuss principles of renal physiology as it relates to nurse anesthesia practice.
13. Describe components of the intravascular space and associated pathological conditions.
14. Integrate physiologic and pathophysiologic principles and relationships to develop basic nurse anesthesia management strategies for maintaining homeostasis in the preoperative, intraoperative and postoperative settings.

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://www.vps.msu.edu/SpLife/acfree.htm), The College of Nursing Handbook (http://nursing.msu.edu), and the Nurse Anesthesia Program Supplement.

B. Testing
   All materials brought into a test, except for number 2 pencils with an eraser and calculator must be left in the front of the classroom. Students may not wear coats or jackets during the examination.

   Students may not leave the room until all students have completed their exams.

   If the instructor suspects any sharing during an exam, all students involved will receive a 0 on that exam, and will face all consequences of academic dishonesty according to the MSU College of Nursing Student Handbook.
Students must use MSU College of Nursing approved calculator for examinations. Students may not borrow calculators from other students during the examination.

Any student who is absent from an examination must notify faculty prior to the examination. The student will be given the opportunity to make-up the missed exam with the faculty member during office hours. Only one test can be missed and the student given a chance to take a make-up examination during this course. Any other missed exams will be assigned a grade of zero.

C. Calculators
Calculators are permitted; however, cellular telephone calculators and PDA calculators will not be used. No sharing of calculators will be permitted during exams. If calculators are forgotten, students must calculate the answers manually.

D. Electronic Communication Devices
All cellular telephones are to be placed in the vibration mode or turned off during class. Beepers should be placed in the vibration mode during class. No cellular phones or beepers will be permitted on the student’s person during examinations.

E. Children in the Classroom
Because of the intensity of these courses, faculty is unable to provide an environment conducive to learning and testing with children present. Students are expected to make child care arrangements in advance.

F. Appeal of Test Question/Grades
Appeals of test questions must be made within 5 days after the date of the examination. All appeals will be evaluated individually and must be made on the “Appeal of Test Question” form (attached).

According to the policies of The Michigan State University College of Nursing, grades may be appealed only for reasons of discrimination. All appeals must be made in writing. See the current Student Handbook for the appropriate form. The appeal must be made to the faculty member and course coordinator within one week. The appeal must be accompanied by a legible copy of all student work in the course at the occurrence/failure.

After appealing to the faculty and course chair, the student may appeal to the MSU College of Nursing Student Services Office. Grade appeals must be made in writing to the Director of Student Services and to the Associate Dean of Academic Affairs within 5 working days after appealing to the faculty and course chair.

The third level of appeal may be made in writing to the Dean of the MSU College of Nursing. The last level of appeal is at the university level. Students are referred to The MSU Student Handbook for this process of grade appeal.

G. Progression in the Major
NUR 877 is a required course in the nurse anesthesia curriculum. In order to progress, a student must pass this course with a grade of “B” or better.

H. Change in Calendar
The faculty reserves the right to alter the calendar as circumstances may dictate. All changes will be announced and discussed in class, posted on the College of Nursing email or on ANGEL. Students not present in class are responsible for obtaining this information.

I. 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.
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 Nurse Anesthesia Program 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 NUR877. 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](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:** The course calendar, reading assignments and test dates will be provided the first day of class. The instructor reserves the right to adjust the calendar according to the needs of the class. The date of the cumulative final exam is based on the University final exam schedule.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 11, 2010</td>
<td>Internal Environment; The Cell; Movement of Substances Across Membranes</td>
<td>Lourens</td>
</tr>
<tr>
<td>January 18, 2010</td>
<td><strong>Martin Luther King Holiday – No Class</strong></td>
<td>Lourens</td>
</tr>
<tr>
<td>January 25, 2010</td>
<td>Genetic Control; Introduction to Genetic Disease Identification; Membrane Potentials</td>
<td>Lourens</td>
</tr>
<tr>
<td>February 1, 2010</td>
<td>Skeletal Muscle; Skeletal Muscle Pathophysiology; Second Messenger Systems</td>
<td>Lourens</td>
</tr>
<tr>
<td>February 8, 2010</td>
<td><strong>Exam I (1.5 hours);</strong> Smooth Muscle</td>
<td>Lourens</td>
</tr>
<tr>
<td>February 15, 2010</td>
<td>Vascular Distensibility; Local and Humoral Control of Blood Flow through Tissue;</td>
<td>Lourens</td>
</tr>
<tr>
<td>February 22, 2010</td>
<td>Microcirculation and Lymph; Introduction to Physics Associated with Vascular and Cardiac Dynamics</td>
<td>Lourens</td>
</tr>
<tr>
<td>March 1, 2010</td>
<td>Cardiac Muscle Action Potentials</td>
<td>Lourens</td>
</tr>
<tr>
<td></td>
<td>Cardiac Nodal Action Potentials</td>
<td></td>
</tr>
<tr>
<td>March 8, 2010</td>
<td><strong>Spring Break – No Class</strong></td>
<td>Lourens</td>
</tr>
<tr>
<td>March 15, 2010</td>
<td><strong>Exam II (1.5 hours);</strong> The Heart as a Pump</td>
<td>Lourens</td>
</tr>
<tr>
<td>March 22, 2010</td>
<td>The Heart as a Pump; The ECG; Cardiac Pathophysiology</td>
<td>Lourens</td>
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<tr>
<td>March 29, 2010</td>
<td>Cardiac Pathophysiology</td>
<td>Lourens</td>
</tr>
<tr>
<td>April 5, 2010</td>
<td>The Kidney</td>
<td>Lourens</td>
</tr>
<tr>
<td>April 12, 2010</td>
<td>The Kidney /Electrolyte Control</td>
<td>Lourens</td>
</tr>
<tr>
<td>April 19, 2010</td>
<td><strong>Exam III (1.5 hours);</strong> pH</td>
<td>Lourens</td>
</tr>
<tr>
<td>April 26, 2010</td>
<td>Renal Pathophysiology /Introduction to Hemostasis, Clotting Cascade</td>
<td>Lourens</td>
</tr>
<tr>
<td>Week of May 3, 2010</td>
<td><strong>FINALS – DATE TBA</strong></td>
<td>Lourens</td>
</tr>
</tbody>
</table>