Anesthesia Physiology & Pathophysiology
NUR 877-Section 001
Room A-107 Life Sciences Building
Thursdays, 12:40-3:30 pm
3 Credits
Spring 2013

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

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.

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 B. Lourens, BSN, MS, CRNA
gayle.lourens@hc.msu.edu
Office Location: A-121 Life Science Building
Office Phone: 517-432-8163
Cell Phone: 517-862-5666
Office Hours: Arranged; however, available as needed for students in the Nurse Anesthesia Program to accommodate student schedules.
Instruction:

a. Methodology: Presentation of course content is accomplished through weekly scheduled class meeting times. As adult learners, it is expected that students will complete assigned readings prior to class. Content will be delivered utilizing the following instructional methods:
   - Classroom lectures
   - Classroom discussion
   - Worksheet assignments
   - Readings from textbooks, journals or web pages (as assigned)
   - Exams
   - Self-evaluation (LonCapa)
   - Student/faculty conferences
   - Voice over power points (or an equivalency), narrative and audiofiles

b. Writing requirements: Students are required to follow APA format guidelines (6th edition) when completing written assignments.

c. Required Texts:


Required Resources, References, Supplies:

- Desire2Learn Help Line
  1-800-500-1554 (24 hours, 7 days/week)
  517-355-2345 (local; 24 hours, 7 days/week)
- Access to, and ability to use, Microsoft Office Word and Power Point
- Basic Scientific Calculator (scientific notation, log function, exponential functions, roots, square roots). Note: Calculators on mobile or phone devices are acceptable as calculators in class but not during exams.
• Frequently Called Telephone Numbers:

Colleen Wager
Graduate Clinical Program’s Secretary
Phone: 517-432-0474
E-mail: colleen.wager@hc.msu.edu

Nikki O’Brien
Student Advisor, Academic Specialist
College of Nursing Student Support Services
Bott Building C-134
Phone: 517-355-8311
E-mail: obrienni@msu.edu

Evaluation:

a. Learning Assessments and Grading: In order to Pass the course, the student must achieve an overall grade of 80% or higher. Failure to meet 80% in the course will constitute a failing grade and the student will not be allowed to continue in the nurse anesthesia program. The MSN and Nurse Anesthesia Supplemental Handbooks discuss the procedures in the event of a failure of a course. There is no opportunity for “extra credit” or “make up work” in this course and late work will not be accepted. Late assignments will be assigned a grade of “0”.

b. The following grading scale will be used in this course:

<table>
<thead>
<tr>
<th>%</th>
<th>GRADE</th>
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<tbody>
<tr>
<td>94 - 100</td>
<td>4.0</td>
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<td>87 - 93</td>
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<td>80 - 86</td>
<td>3.0</td>
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<td>75 - 79</td>
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<td>70 - 74</td>
<td>2.0</td>
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<tr>
<td>65 - 69</td>
<td>1.5</td>
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<tr>
<td>60 - 64</td>
<td>1.0</td>
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<tr>
<td>Below 60</td>
<td>0.0</td>
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c. Evaluation Components:

<table>
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<tr>
<th>Exam / Assignment</th>
<th>Weighted %</th>
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<tr>
<td>Exam 1</td>
<td>20%</td>
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<td>Exam 2</td>
<td>20%</td>
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<tr>
<td>Exam 3</td>
<td>20%</td>
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<tr>
<td>Cumulative Final</td>
<td>30%</td>
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<tr>
<td>Weekly Assignment Worksheets</td>
<td>10%</td>
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1. Exams: Three proctored, timed (60 minutes) exams will be administered through the D2L site during the semester. Each exam represents 20% of the final grade. Exams are based on information obtained from assigned readings, online sources, lecture content and worksheet-associated class discussions.

2. Cumulative Final: A proctored, timed (120 minutes) cumulative final will be administered during finals week at the end of the semester. The exam represents 30% of the final grade.

3. Weekly Worksheets: Excluding exam weeks, a weekly worksheet will be posted on the D2L site 1 week prior to the due date. The purpose of the worksheets is to familiarize the student with reputable, anesthesia-related resources and introduce physiological and pathophysiological principles within the context of nurse anesthesia practice. Responses will be referenced using APA format (6th edition).

   Appropriate references include:
   - Reputable, current, scholarly books
   - Evidence based journal articles
   - Continuing education, case study articles, theses

   Inappropriate reference sources:
   - Wikipedia (is not a primary source and has poor quality control)
   - Blogs
   - Personal opinion articles
   - Non-scholarly discussion boards

The completed worksheets will be discussed in class. According to the rubric posted in the D2L course site, points will be earned based on quality of work and class participation. The worksheets will account for 10% of the overall final grade.
d. Appeal of a test question: All inquiries/appeal of a test question must be made on this form. No appeal will be accepted unless received within 5 days of the posted grade/test review. 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: ___________________
c. Testing and Classroom Conduct:

- Class begins promptly at the scheduled time. To avoid class disruption, a student who is late will be asked to join following a class break.
- Attending class is mandatory. A student who misses class or arrives late will be responsible for the missed content and obtaining said content.
- Any student who will be absent from an exam must notify faculty prior to the examination. The student will be given the opportunity to make up the missed exam with the faculty member or faculty-designated proctor. The faculty member will select and schedule the date and time. Only one exam can be missed and made up during this course. Any other missed exam(s) will be assigned a grade of zero.
- All cell phones or handheld devices are to be silenced or turned off during class. Checking e-mail or texting during class is disruptive and the student will be asked to leave.
- All materials brought into an exam (except for a writing utensil, eraser and calculator) must be left in front of the room. Students may not wear coats or jackets during an exam.
- A mobile device cannot serve as a calculator. Students who forget to bring an approved calculator to an exam will calculate the problem manually.
- If the instructor suspects any sharing during an exam, all students involved will receive a zero on that exam and will face all consequences of academic dishonesty according to the MSU College of Nursing Student Handbook and Michigan State University Policy.
- Due to the intensity of the course, faculty are unable to provide an environment conducive to learning and testing with children present. Students are expected to make child care arrangements in advance.

f. Change in Calendar: The faculty reserves the right to alter the calendar as circumstances may dictate. All changes will be announced in class or posted in the D2L course as a communication item.

Professionalism: Preparation as an advanced practice nurse requires more than the acquisition and application of knowledge. In addition to the academic standards listed, the student must demonstrate:

- Appropriate interpersonal relations and communications with peers, faculty and MSU College of Nursing staff
- Respect for faculty and classmates
- Honesty and integrity in all academic and professional matters
- The ability to interact with course faculty when there are questions and/or concerns regarding evaluation. The faculty of record or lead faculty should be contacted first.

In order to facilitate a climate of academic excellence and integrity, the faculty of the College of Nursing adopted the following Honor Code. Students are expected to contribute to the legitimacy of their degree by confidentially reporting breeches to this honor code:

- I vow to hold myself and my peers to the highest measure of honesty and integrity
- I commit myself to respectful and professional conduct in all classroom and clinical interactions
- I will neither give nor receive any unauthorized assistance in completing my assigned academic work
- I will always prepare completely to care for my patients before attending clinical
• I will hold in confidence all personal matters coming to my knowledge in the practice of my calling
• I will do all in my power to maintain and elevate the standard of my chosen profession

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 MSN Student Handbook: http://nursing.msu.edu/MSN%20Programs/Handbooks/default.htm
- Information for MSU Students: http://www.msu.edu/current/index.html
- Academic Programs: http://www.reg.msu.edu/AcademicPrograms
- Code of Teaching Responsibility and Student Assessments and Final Grades: http://www.reg.msu.edu/AcademicPrograms/Print.asp?Section=514
- Integrity of Scholarship and Grades: http://www.reg.msu.edu/AcademicPrograms/Print.asp?Section=534

University 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 College 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 http://splife.studentlife.msu.edu/ 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 370. 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 https://www.msu.edu/unit/ombud/academic-integrity/index.html#regulations

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.

 Attendence: 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. See the Ombudsman’s website for a discussion of student observance of major religious holidays, student-athlete participation in athletic competition, student participation in university-approved field trips, medical excuses and a dean's drop for students who fail to attend class sessions at the beginning of the semester.

 College of Nursing Policies: Professional Development Guidelines are found in CON Student Handbooks at CON website. Students are responsible for the information found in the CON Masters of Science in Nursing Handbook and the Nurse Anesthesia Supplement Handbook.
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<thead>
<tr>
<th>Date</th>
<th>Course Objective</th>
<th>Topic Content</th>
<th>Textbook / Readings / Links</th>
<th>Activities</th>
<th>Faculty</th>
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<tbody>
<tr>
<td>Week 1 (Jan 10)</td>
<td>1, 3</td>
<td>Internal Environment The Cell Movement of Substances Across Membranes</td>
<td>Guyton, Chapter 1, 2, 4 Elyssi, A.R., &amp; Rowshan, M.H. (G6PD)</td>
<td>+ Review Syllabus + Self Assessment + Readings</td>
<td>Lourens</td>
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<tr>
<td>Week 2 (Jan 17)</td>
<td>1, 2</td>
<td>Genetic Control Introduction to Genetic Disease Patterns Cancer Basics</td>
<td>Guyton, Chapter 3 Stoelting Coexisting, pg 493-495 Kavanagh, T. &amp; Buggy, D.J. (Anesthesia Impact on Cancer Outcomes)</td>
<td>+ Self Assessment + Readings + Review Posted Links + LonCapa (MRNA, DNA practice options) + Complete <strong>Worksheet 1 (bring to class)</strong></td>
<td>Lourens</td>
</tr>
<tr>
<td>Week 3 (Jan 24)</td>
<td>1, 2</td>
<td>Membrane Potentials Skeletal Muscle</td>
<td>Guyton, Chapter 5, 6, 7</td>
<td>+ Self Assessment + Reading + Complete Worksheet 2 (bring to class)</td>
<td>Lourens</td>
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<tr>
<td>Week 4 (Jan 31)</td>
<td>1, 2, 3</td>
<td>Skeletal Muscle Pathophysiology Second Messenger Systems Introduction to Heart Anatomy</td>
<td>Guyton Chapter 9, 74 (pg 887-890) Stoelting Coexisting, pg 444-452 (neuromuscular diseases section) Briggs, E.D. &amp; Kirsch, J.R. (Anesthesia and Neuromuscular Disease)</td>
<td>+ Self Assessment + Readings + Complete Worksheet 3 (bring to class)</td>
<td>Lourens</td>
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<tr>
<td>Week</td>
<td>Dates</td>
<td>Readings</td>
<td>Notes</td>
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| 5    | (Feb 7) | 1, 2 | Cardiac Muscle Action Potentials | Guyton Chapter 9 | + Exam I (1.0 hour)  
|      |       |       |       | + Readings  
|      |       |       |       | + NO WORKSHEET DUE |
| 6    | (Feb 11) | 2, 3 | Cardiac Nodal Action Potentials  
|      |       |       |       | The Heart as a Pump  
|      |       |       |       | Flow - Volume Loops | Guyton Chapter 9, 10, 20 | + Self Assessment  
|      |       |       |       | + Readings  
|      |       |       |       | + Complete Worksheet 4 (bring to class)  
|      |       |       |       | + LonCapa (cardiac calculations) |
| 7    | (Feb 14) | 1 | The Normal Electrocardiogram  
|      |       |       |       | Electrocardiographic Interpretation of Cardiac Muscle and Coronary Blood Flow Abnormalities | Guyton Chapter 12, 13  
|      |       |       |       | Stoelting Coexisting Chapter 4 | + Self Assessment  
|      |       |       |       | + Readings  
|      |       |       |       | + Complete Worksheet 5 (bring to class)  
|      |       |       |       | + LonCapa (cardiac calculations) |
| 8    | (Feb 28) | 1, 2 | Arrythmia Recognition and Pharmacological Treatment Cardiac Pathophysiology (Part I) | Guyton Chapter 13, 22  
|      |       |       |       | Stoelting Coexisting Chapter 1, 2 6 (pg 120-140) | + Self Assessment  
|      |       |       |       | + Readings  
|      |       |       |       | + Complete Worksheet 6 (bring to class) |

**Review posted links:**  
Determinants of Cardiac Output @ https://www.youtube.com/watch?v=an7QHiGcmLG  
https://www.youtube.com/watch?v=vm7CvD7rB5M  
https://www.youtube.com/watch?v=ljW1pkLKlIY

**Interactive Simulator On-line @** http://www.skillstat.com/tools/ecg-simulator/#/-play
<table>
<thead>
<tr>
<th>Week 9 (March 7)</th>
<th><strong>Spring Break – No Class (March 4-8)</strong></th>
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<tbody>
<tr>
<td>Week 10 (Mar 14)</td>
<td>2, 3</td>
<td>Cardiac Pathophysiology (Part II) Physics Associated with Vascular and Cardiac Dynamics Guyton Chapter 15, 23 Stoelting Coexisting Chapter 6 (pg 120-140) Hart, B., &amp; Jaffer, A.K. (Beta Blocker Therapy for Non-Cardiac Surgical Patients)</td>
</tr>
<tr>
<td>Week 11 (Mar 21)</td>
<td>1, 2, 3</td>
<td>Smooth Muscle Vascular Distensibility A-lines and Reflective Waves Function of Arterial and Venous Systems Microcirculation and Lymph Guyton Chapter 8, 15, 16 Review Posted Links: Arterial Lines and Vascular Pathology@ <a href="http://www.unpopularmedicine.com/files/Intensive%20Care/Hemodynamic%20Monitoring/Abnormal%20arterial%20line%20waveforms.pdf">http://www.unpopularmedicine.com/files/Intensive%20Care/Hemodynamic%20Monitoring/Abnormal%20arterial%20line%20waveforms.pdf</a> + Self Assessment + Readings + Worksheet 7 (bring to class) Lourens</td>
</tr>
<tr>
<td>Week 12 (Mar 28)</td>
<td>3</td>
<td>The Kidney Role of Kidney in Long-Term BP Control Guyton Chapter 26, 27, 19 + Self Assessment + Readings + Worksheet 8 (bring to class) Lourens</td>
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<tr>
<td>Week 13 (Apr 4)</td>
<td>1, 2</td>
<td>Diuretics Electrolyte Control Kidney Role in Acid Base Balance Guyton Chapter 29, 30, 31 + Readings + Worksheet 9 (bring to class) Lourens</td>
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<tr>
<td>Week 14 (Apr 11)</td>
<td>2, 3</td>
<td>Renal Pathophysiology Stoelting Coexisting, Chapter 17 + Self Assessment + Readings Lourens</td>
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<tr>
<td>Week 15 (Apr 18)</td>
<td>1, 2, 3</td>
<td>Classifications of Shock</td>
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<tr>
<td>Week 16 (Apr 25)</td>
<td>In-Class Review</td>
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<tr>
<td>Week 17 (May 2)</td>
<td><strong>FINALS – DATE TBA</strong></td>
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