Anesthesia Physiology & Pathophysiology  
NUR 877 Section 001  
Room A107 Life Sciences Building  
Thursdays, 12:40-3:30 pm  
3 Credits  
Spring 2015

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 advance 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:

   http://www.aacn.nche.edu/education-resources/MastersEssentials11.pdf
2. The American Nurses Association Code of Ethics (2010) retrieved from  
   http://www.nursingworld.org/codeofethics
   http://www.aana.com/resources2/professionalpractice/Documents/PPM%20Code%20of%20Ethics.pdf
Faculty Contact Information:
Gayle B. Lourens, DNP, 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: Thursday, 11:30 a.m. -12:30 p.m. and 3:30-4:30p.m.; to accommodate student schedules, additional hours can be arranged as needed.

Instruction:

a. Methodology: Presentation of course content is accomplished through weekly 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-assessments
   • Student/faculty conferences
   • Voice over power points (or equivalency) 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:
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:

Desire2Learn Help Line  
1-800-500-1554 (24 hours, 7 days/week)  
517-355-2345 (local; 24 hours, 7 days/week)

Stefanie Abbey, Graduate Clinical Program’s Secretary  
Phone: 517-432-0474  
E-mail: stefanie.abbey@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 failed course. **There is no opportunity for “extra credit” or “make up work” in this course.** Late work will be assigned a grade of “0” unless prior approval has been granted by the course faculty due to special circumstances.

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>
</tr>
<tr>
<td>87 – 93</td>
<td>3.5</td>
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<tr>
<td>80 – 86</td>
<td>3.0</td>
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<tr>
<td>75 – 79</td>
<td>2.5</td>
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<tr>
<td>70 – 74</td>
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<tr>
<td>65 – 69</td>
<td>1.5</td>
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<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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Evaluation Components:

<table>
<thead>
<tr>
<th>Exam / Assignment</th>
<th>Weighted %</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>20%</td>
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<tr>
<td>Exam 2</td>
<td>20%</td>
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<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>
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1. Exams: Three proctored, timed (60 minutes) exams will be administered 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 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 modules, case study articles, theses
   - Class lectures

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

The completed worksheets will be discussed in class. According to the rubric posted on 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.
c. 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: ________________
e. 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 exam. 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. All subsequent 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, we are unable to provide an environment conducive to learning and testing with children present. Students are expected to make child care arrangements in advance.

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.

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. See the Ombudsman’s web site 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.
<table>
<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</td>
<td>1, 3</td>
<td>Internal Environment</td>
<td>Guyton, Chapter 1, 2, 4&lt;br&gt;Rodrigo, C. (2001). The effects of cigarette smoking on Anesthesia. <em>Anesthesia Progress</em>, 47:143-150.</td>
<td>+ Review Syllabus&lt;br&gt;+ Self Assessment&lt;br&gt;+ Readings</td>
<td>Lourens</td>
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<tr>
<td>(Jan 15)</td>
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<td>The Cell</td>
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<td>Movement of Substances</td>
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<td>Across Membranes</td>
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<tr>
<td>(Jan 22)</td>
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<td>Introduction to Genetic Disease Patterns</td>
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<td></td>
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<td>Cancer Basics</td>
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<tr>
<td>Week 3</td>
<td>1, 2</td>
<td>Membrane Potentials</td>
<td>Guyton, Chapter 6,7,9&lt;br&gt;Stoelting Coexisting, pg 444-452 (neuromuscular diseases section)&lt;br&gt;Briggs, E.D. &amp; Kirsch, J.R. (2003) Anesthesia and neuromuscular disease. <em>Journal of Anesthesia</em> 17,177-185. doi: 10.1007/s00540-003-0169-5</td>
<td>+ Self Assessment&lt;br&gt;+ Reading&lt;br&gt;+ Complete <em>Worksheet 2</em> (bring to class)</td>
<td>Lourens</td>
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<tr>
<td>(Jan 29)</td>
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<td>Skeletal Muscle</td>
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<td>Skeletal Muscle Pathophysiology</td>
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| Week 4 (Feb 5) | 1, 2, 3 | Second Messenger Systems Introduction to Heart Anatomy | Guyton Chapter 74 (pg 887-890) | Review Posted Links:  
- Epinephrine and Adenylyl Cyclase @ http://bcs.whfreeman.com/thelifewire/content/chp15/15020.html | + Self Assessment  
+ Readings  
+ Complete Worksheet 3 (bring to class) | Lourens |
|---------------|---------|------------------------------------------------------|-----------------------------|-------------------------------------------------|----------------------------------|--------|
| Week 5 (Feb 12) | 1, 2   | Cardiac Muscle Action Potentials | Guyton Chapter 9 |  | + Exam I (1.0 hour)  
+ Readings  
+ NO WORKSHEET DUE | Lourens |
| Week 6-7 (Feb 19-26) | 2, 3  | Cardiac Nodal Action Potentials  
The Heart as a Pump Flow - Volume Loops | Guyton Chapter 9, 10, 20 | Review posted links:  
Determinants of Cardiac Output @ https://www.youtube.com/watch?v=an7QHiGCmLg  
https://www.youtube.com/watch?v=vm7CvD7rBsM  
https://www.youtube.com/watch?v=ljWIpkLKLlY | + Self Assessment  
+ Readings  
+ Complete Worksheet 4 (bring to class)  
+ Self-Paced Hemodyamic Calculations Worksheet | Lourens |
| Week 8 (Mar 5) | 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)  
+ Self-paced axis deviation and 12 lead interpretation worksheet | Lourens |
<table>
<thead>
<tr>
<th>Week 9  (March 12)</th>
<th>Spring Break – No Class  (March 4-8)</th>
<th></th>
<th>Lourens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 10  (March 19)</td>
<td>1, 2  Arrhythmia Recognition Cardiac Pathophysiology (Part I)</td>
<td>Guyton Chapter 13, 22  Stoelting Coexisting Chapter 1, 2 6 (pg 120-140) <strong>Interactive Simulator On-line @</strong>  <a href="http://www.skillstat.com/tools/ecg-simulator#/-play">http://www.skillstat.com/tools/ecg-simulator#/-play</a></td>
<td>+ Self Assessment  + Readings  + Complete Worksheet 6 (bring to class)</td>
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<td></td>
<td>2, 3  Cardiac Pathophysiology (Part II) Antiarrhythmic Drugs  Physics Associated with Vascular and Cardiac Dynamics</td>
<td>Guyton Chapter 15, 23  Stoelting Coexisting Chapter 6 (pg 120-140)  Exam II (1.25 hours)  + Readings  + NO WORKSHEET</td>
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<tr>
<td>Week 13  (Apr 9)</td>
<td>3</td>
<td>The Kidney Role of Kidney in Long-Term BP Control</td>
<td>Guyton Chapter 26, 27, 19</td>
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<tr>
<td>Week 14  (Apr 16)</td>
<td>1, 2</td>
<td>Diuretics Electrolyte Control Kidney Role in Acid Base Balance</td>
<td>Guyton Chapter 29, 30, 31</td>
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<tr>
<td>Week 16  (Apr 30)</td>
<td></td>
<td>In-Class Review</td>
<td>In-class review and preparation for Cumulative Final Exam</td>
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<tr>
<td>Week 17  (May 7)</td>
<td></td>
<td><strong>FINALS – DATE TBA</strong></td>
<td><strong>Cumulative Final Exam</strong> (2 hours)</td>
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