

GEORGE MASON UNIVERSITY
College of Health and Human Services
School of Nursing

NURS 455
Special Topics in Nursing: Advanced Technologies (2)
SYLLABUS SPRING 2008

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GEORGE MASON UNIVERSITY
College of Health and Human Services

Course Number: N455

Course Title: Special Topics in Nursing: Advanced Technologies (2:1:1)

Credits: 2

Placement in the Curriculum: Senior Year; 1st 7 weeks of the Fall or Spring semester. When: N451-Advanced Clinical preceptorship, is taken the 2nd 7 weeks of the same semester.

Course Description:

This advanced technology course provides an opportunity for students to develop a knowledge base related to the acquisition of advanced skills in nursing practice. Refinement of assessment skills associated with selected advanced technologies will be integrated into this laboratory course during 6 hours of lab/week.

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

1. Identify assessment skills necessary to make decisions related to performing advanced technologies.
2. Perform selected advanced technologies within the campus laboratory setting.
3. Identify methods for modifying technologies as the situation warrants.
4. Evaluate the effectiveness of nursing interventions associated with performing advanced technologies.
5. Identify appropriate documentation information related to the performance of advanced technologies.
6. List safety factors for selected technologies.
7. Demonstrate critical thinking skills through the integration of scenario based evaluation

Prerequisite Requirements:

To succeed in this course, students must have a basic knowledge of Anatomy & Physiology, Maslow's Hierarchy, basic nursing care, medication administration, the nursing process, **nursing diagnoses**, and an understanding of common disease processes. Disease processes include, but are not limited to, diabetes, asthma, chronic obstructive pulmonary disease, pneumonia, congestive heart failure, myocardial infarction, hypertension, cerebral vascular accident, cancers, and dehydration.

Teaching Strategies: Lecture, discussion, patient case studies, campus lab application in small groups, demonstration & return demonstration, IV catheter simulation, sim-man, role-play.

Evaluation Methods: **Weekly quizzes. Students must have a 73% or higher on each quiz to pass each quiz. An average of 73% on all quizzes is needed to pass this portion of the course. There will be no rounding.** Quizzes will be given via Webct. Quizzes will be opened on each Friday morning at 0800 and remain open until Monday morning 0800. You will be given 30 minutes to take each quiz.
Questions regarding quiz grades are to be scheduled with the class instructor during office hours only.

Lab Skills Performance:

(A total score of less than 100 points will result in an unsatisfactory grade for this area. YOU MUST PASS THIS SECTION TO PASS THE CLASS. !!!!!!!)

Students will be placed into pairs or fours for lab practice time. There is mandatory lab time scheduled on Tuesdays following the didactic class. This time will be used to demonstrate each new skill, pass out supplies, and practice with supervision. The first 30 minutes of lab will be used for Problem based learning (to be discussed in next session). The remainder of lab class will be used for test out. Students will be allotted 10 minutes to perform the technology following the guidelines in the syllabus. Critical areas will be identified and students must perform them correctly to receive full points for that skill. Each skill (6) will be worth **20** points for a total of **120** points. (20 points per skill) Students not passing the 1st skill evaluation will lose **5** points. **Each re-evaluation will result in losing 5 points. 100** points or higher **total** will assure passing the technology section. That gives the student only **4** chances to re-test. For example, if a student does not pass three skill evaluations for wound care, he/she will only receive 5 points for that skill. However, he/she may get 20 points on the other 5 skills, that student will end up with a score of 105, which is passing. Any student who does not pass their first skill

evaluation will be required to attend open lab, practice, and be re-evaluated the next week at the end of lab class. **It is the student's responsibility to schedule time with the instructor for re-evaluation.**

PBL Case Studies: PBL's (Problem-based learning) will be introduced to students during senior lab. Each student will be given a case study consisting of a clinical problem. The student will work through each case study using a systematic, problem-solving process. Each student will explore the data in the cases, draw inferences, make deductions, identify assumptions, and generate conclusions. *These assignments will be written and completed within 30 minutes at the beginning of lab class.* They will be turned in to your lab instructor and graded by the course coordinator. They will be returned to you the following week in lab class.

The grading for the case studies will be **PASS/FAIL**.

4 out of 5 PBL's must be passed to pass this portion of the course.

Criteria for grading case studies: Specific PBL guidelines will be given to you on the first class meeting. Students should use all acquired knowledge learned in the nursing program, thus far, to complete the case studies. Consider ABC's, Maslow's Hierarchy of Needs, and assessment skills. Synthesis of information and application of knowledge should be used to complete case studies. Case studies should be completed and turned in on time.

Final Examination: There will be a final multiple-choice exam, **on paper**, which will be cumulative and include dosage/IV calculations to be done **without** calculators. **The passing score will be 73% or greater.** The final skill evaluation will be a scenario based mock code. This will be done in groups of 4 with one evaluator. Each student will take turns performing roles during a code scenario.

Assessment skills, synthesis, application of learned information, and CPR/BLS skills will be strongly evaluated. This will be pass/fail. There will be no scheduling for re-evaluation of the final.

Final Evaluation: The course will be graded as Satisfactory or Unsatisfactory based on weekly quizzes, skills performance, accurate completion of PBL's, and the final test out. There are a total of four areas that are considered a part of the final satisfactory grade. Passing three or more of these areas is required to receive a passing grade for the course.

- ****The instructor reserves the right to adjust the content and rate of completing material according to the needs of the class.****
- ****You must have an active George Mason University e-mail account and be able to access webct41.gmu.edu for this class.****

If you are a student with a disability and you need academic accommodations, please see the course coordinator and contact the Disability Resource Center (DRC) at 703-993-2474. All academic accommodations must be arranged through the DRC.

1. All students are expected to adhere to the George Mason University Honor Code. Honor code: “To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code: *Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work*” (*George Mason University Catalog, 2006-2007, p. 31*).
2. Professional Behavior Expectations: All members of the George Mason University community (students and instructors) are expected to communicate in a courteous and respectful manner. All verbal, written and electronic communications must be conducted in a thoughtful and professional manner. Please refer to the Student Handbook-Behavior Expectations under the Judicial Code or view Judicial Code at: <http://www.gmu.edu/departments/unilife/code.htm>.
3. Computer Agreement: Students must agree to abide by the university policy for Responsible Use of Computing. See <http://mail.gmu.edu> and click on Responsible Use of Computing.
4. E-mails will be accepted in a non-emergent form Monday – Friday until 9:00p.m. Students can send e-mails to the instructor on the weekend, but there will be no response until Monday morning, unless there is an emergency.....

Professionalism:

Students are expected to conduct themselves in a manner conducive to an environment of academic integrity, professionalism, and of respect for the educational process and the safety and well-being of all students. This includes:

1. No cheating
2. No plagiarism
3. No fabrication

4. Complying with additional specific criteria for academic conduct communicated by the instructor to his/her class regarding assignments, tests, and/or exams.
5. Arriving to class on time and remaining until the end of class.
6. Wearing the proper attire for laboratory learning:
 - Wearing hair above the collar and pulled back from the face
 - No dangling jewelry
 - No open toe shoes or heels
 - No perfumes/fragrances
 - No long/artificial fingernails, flesh-tone polish or clear allowed
 - No gum
 - Appropriate make-up
 - Non-wrinkled lab coat with patch and name tag.

7. There will be no pens used in lab.

****NURSES CARRY A LOT OF RESPECT, SO WE MUST LOOK AND ACT PROFESSIONAL****

Required Textbooks:

Ignatavicius, D. D. & Workman. M. L. (2006). *Medical-surgical nursing*. (5th edition). Philadelphia, PA: W.B. Saunders.

Perry, A. & Potter, P. (2006). *Clinical nursing skills & techniques*. (6th edition.). St. Louis, MO: Saunders.

Lab Schedule & General Topical Outline

Week 1 Brief Course Orientation/ Advanced assessment

1/22/08 Brief assessment review
Review body systems assessment

Tuesday Lecture /Lab demonstration **Review book by C. Jarvis**

Thur or Fri Practice & test out **chs. 1-6, 9-11, 13, 18-23.**

Week 2 Advanced Wound Care

1/29/08 Brief review skin assessment
Review aseptic technique and antibiotics

Tuesday Lecture/Lab demonstration **Iggy: p. 1577 - 1601**

Thur or Fri Practice & test out **P & P: p.1229-1241,1257-1267**

Week 3 Central Venous Catheters /PICC catheters

2/05/08 Brief review central venous circulation
Discuss flushing CVC's, drawing blood, and IV medications

Tuesday Lecture/Lab demonstration. **Iggy: p.249-250, 254, 256-265**

Thur or Fri Practice & test out. **P & P: p. 922-929, 951-961**

Week 4 Venipuncture Technique

2/12/08 Review peripheral venous circulation
Review venous cannulation and blood sampling
Review medications affecting venous vasculature

Tuesday Lecture/Lab demonstration **Iggy: p. 194 - 225**

Thur or Fri Practice & test out **P & P: 909-923, 930-950**

Week 5 EKG's

2/19/08 Brief review of cardiovascular conduction system
Review cellular action potential
Review telemetry monitoring/12-lead EKG's/arrhythmias
Discuss pertinent cardiac medications

Tuesday Lecture /lab demonstration **Iggy: p. 699 - 747**

Thur or Fri Practice & test out **P & P: p. 1512 - 1516**

Week 6 Mock Code

2/26/08 Review CPR with new guidelines
Review and discuss nursing roles during a code
Review emergency cardiac drugs/ pulseless algorithms/use of AED
Emergency patient assessment
Demonstrate performance of CPR and use of AED/defibrillator

Tuesday Lecture/lab demonstration **P & P: p. 884 - 897**
Thur or Fri Practice & test out

Week 7 Final exam
3/04/08 Will be administered in Tuesday's class at 0830

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- **Students must work on the IV simulator in the computer lab Rob B 470 prior to the IV practice lab. Check with Terri Guingab or e-mail her @ tguingab@gmu.edu to set up your practice time.**

*****P & P = Perry & Potter**

*****Iggy = Ignatavicius**

GEORGE MASON UNIVERSITY
College of Health and Human Services

Senior Level Technologies
Care of Clients Requiring Central Venous Access

UNIT OBJECTIVES:

By the end of Unit 2, the student will be able to:

1. Identify the anatomic location of the subclavian, basilic, and median cubital veins and placement of central venous catheter (CVC) and peripherally inserted central venous catheter (PICC).
2. Identify the most common complications of central venous catheter (CVC) and peripherally inserted central venous catheter (PICC) placement, both during and after insertion.
3. Discuss physiology as it relates to CVC and PICC injuries:
 - a) air embolism
 - b) infection
 - c) thrombus
 - d) pneumothorax/hemothorax
 - e) mechanical phlebitis PICC specific
4. Identify indications for CVC/PICC line insertion.
5. Identify nursing implications as they relate to:
 - a) dressing change
 - b) blood drawing
 - c) IV medication administration
6. Medications commonly given via CVC/PICC line

REQUIRED LAB ACTIVITIES:

1. Accurate demonstration of central venous catheter dressing change, medication administration and blood draw.
- I. Equipment:
- A. Overhead projector

B. Prep Items and Dressing Materials:

1. (1) large tegaderm dressing
2. (1) chloroprep
3. 2 pair sterile gloves
4. (1) face mask
5. Triple Lumen Catheter with (3) different end ports
6. Syringes-2(10cc) NS, 1(10cc) MED, 1(10cc) Heparin(per facility policy)
- per station (needleless system)
7. Multicolored laboratory tubes

GEORGE MASON UNIVERSITY
College of Health and Human Services

Senior Level Technologies
Care of Clients Requiring Venipuncture

UNIT OBJECTIVES:

By the end of Unit 3, the student will be able to:

1. Identify the distribution of intracellular and extra cellular electrolytes.
 2. Discuss the regulation of homeo-static mechanisms and their relationships in capillary fluid shifting.
 3. Discuss 3 types of intravenous solutions and their applications.
 4. Identify and demonstrate proper vein selection for venipuncture cannulation and venous blood specimen sites.
 5. Explain and demonstrate angiocath insertion into a hand vein site and venous blood specimen collection from a medial vein.
 6. Calculate IV flow rate in drops per minute and ml/hr.
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1. **All students are required to perform I.V. simulation prior to venipuncture lab session number 2. See Terri in the CNHS Technology and Simulation Center to set up appointment.**

REQUIRED LAB ACTIVITIES:

1. Read and sign informed consent form. (**Both pages**)
2. Accurate demonstration of venipuncture competency skill sheet.

I. Equipment:

Venous Cannulation

#22 gauge angiocath

chlororep

tourniquet

(1) saline filled 10cc syringe

(1) twin pack (needless adapter)

Sterile Normal Saline/multidose vial

(1) small tegaderm

bed saver pad (chux) cut in 1/4

gloves - clean - 1 pr

1/4 in tape

Band-Aid

arm and hand vein mannequins

GEORGE MASON UNIVERSITY
College of Health and Human Services

Senior Level Technologies
Care of Clients Requiring Cardiac Monitoring

UNIT OBJECTIVES

Upon completion of unit 4, the student will be able to:

1. Identify the five phases of the cardiac cellular action potential.
2. Discuss the role of electrolytes (Na/K⁺ pump, calcium and Na⁺) in the conduction of electrical impulses.
3. Discuss the normal and abnormal cardiac conduction system and its response.
4. Identify the normal ECG wave configuration and benign cardiac rhythms.
5. Demonstrate and discuss electrode placement for leads I, II, III, and MCL₁.
6. Discuss telemetry monitoring/12-lead EKG's/dysrhythmias
7. Identify lethal ventricular dysrhythmias and corresponding pathophysiology.
8. Discuss pertinent cardiac medications.

Required Lab Activities:

- I. Accurate demonstration of cardiac monitoring lead placement and monitoring, obtaining a 12-lead EKG, and easy rhythm interpretation.
 1. Equipment
 - A. Alcohol Swabs
 - B. Electrodes - (8)
 - C. Paper Towels
 - D. Mannequin
 - F. ECG Simulation

GEORGE MASON UNIVERSITY
College of Health and Human Services

Senior Level Technologies

Care of Clients Requiring Advanced Life Support

UNIT OBJECTIVES:

Upon completion of unit 6, the student will be able to:

1. Identify 4 nursing roles integrated in a mock code.
2. Demonstrate appropriate responses indicated for each of the nursing roles during a mock code.
4. Discuss the use of emergency drugs i.e., indications, actions /administration and major side effects.
5. Demonstrate use of conventional defibrillator and automatic external defibrillator during a ventricular tachycardia (without pulse)/ventricular fibrillation scenario.
6. Demonstrate the key skills of CPR based on new guidelines.

Required Lab Activities:

1. Demonstration of identified roles during a mock code with synthesis of learned information and skills to assist in returning clients respirations and circulation.

Equipment:

Defibrillator	Life-pack 9
Resuscitation mannequin	AED
Code cart	
ECG simulator	
Laerdol facemask	

GEORGE MASON UNIVERSITY
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Senior Level Technologies
Care of Clients Requiring Advanced Wound Care

UNIT OBJECTIVES:

By the end of Unit 1, the student will be able to:

1. Give a verbal assessment of a full thickness wound.
2. Differentiate between the 3 categories of repair (primary, secondary, tertiary).
3. Discuss the physiology of each categorical phase of repair.
4. Discuss wound drainage systems.
5. Discuss wound classification system by identifying characteristics, purpose of wound management, and nursing interventions.
6. Identify clients at risk for alteration in skin integrity.
7. Perform a wound irrigation and obtain a wound culture.

REQUIRED LAB ACTIVITIES:

1. Accurate demonstration of sterile gloving, wound assessments, wound irrigation, applying wet-to-dry or wet-to-moist dressings, and obtaining wound culture.
- I. Equipment:
- A. 5 mannequins with variable full thickness wounds
 1. Median sternotomy wound dehiscence
 - B. Irrigation Set - 1 per station - (30 cc bulb syringe, 150 cc container to hold solution and 2 emesis basins).

PROBLEM BASED LEARNING

Outcomes: By the end of problem based learning, the student will:

1. become a motivated self-directed learner.
2. be able to engage in real-life problems and be able to see the ambiguity that may exist in real-life situations.
3. develop a sound understanding of the knowledge and ability to critique info.
4. be allowed to make sense of the material in their own way by integrating newly acquired knowledge with prior knowledge and experiences.
5. increase critical thinking and decision-making abilities

I. THE PROBLEM BASED TUTORIAL

Each student will be given simulated “clinical problems” in a case-study format. The student will attempt to “resolve” or “work-through” each case study through a systematic, problem-solving process. Students will examine the data in the cases, draw inferences, make deductions, identify assumptions, generate interpretations, evaluate weak and strong arguments, and record their findings and conclusions based on the six categories below.

II. THE TUTORIAL PROCESS

A. INTRODUCTION AND CASE PRESENTATION

1. Introduction of the case should take **NO MORE THAN 5 MINUTES.**
2. Copies of the written case are distributed to each student at the beginning of the class.
NOTE: case studies are received ‘cold’ in order to simulate a ‘real life’ problem.
3. You will have **30** minutes to complete the case study. This will be timed.

CATEGORIES FOR DETERMINATION

1. Known Situational Data that is Important
 - a. Determine what is known about the situation
 - b. Who was/was not mentioned. Whose perspective is not included?
 - c. Look for patterns or trends
 - d. Prioritize the relevant information
 - e. What is/are the issue/s?
2. Hypotheses (educated guesses and/or nursing diagnoses)
 - a. What do you think is going on given the known data?
 - b. Reflect on the data and focus on the issues & problems, then guess what may be the cause/s.
 - c. Brainstorm.
 - d. Look for multiple, competing, or alternative hypotheses...the more the better.

e. Think non-traditionally to capture the multiple factors that could be involved.

3. Strengths

- a. Our role is to help others perceive their strengths and build their capacity.
- b. Solutions are much more likely to work if they are built upon interests, history, and strengths.
- c. Step back from the process and look at the whole person.
- d. A strength is often family or social cohesiveness.

4. Outcomes

- a. List client and staff outcomes, include family.
- b. Be realistic, concrete and specific.
- c. Focus/choose where you can make a positive change.
- d. What would make the situation better and why.
- e. What improvement is expected as basis for evaluation.

5. Strategies

- a. List interventions to improve the situation and achieve the outcomes.
- b. The strategies may emerge with the outcomes.
- ** c. **The data, hypotheses, outcomes, and strategies must relate to each other.**
- d. REMEMBER! We are often solution rich...but they must link to what we think is going on, as well as the expected outcomes. **BRIDGE !!**

6. Learning Issues

- a. Identify topics or elements of an issue that the student team members feel they need, or would like information or further learning about.
- b. These issues may emerge throughout the process.
- c. Explore the learning needs of the tutorial team members.
- d. Explore what is being done about a topic or issue elsewhere.

GRADING CRITERIA FOR THE CASE STUDY TUTORIAL

1. Each category (6) will be assessed and points will be assigned based on a Likert scale (1 = not developed, 6 = very well developed). The points will then be tallied and the final grade will be determined for each case study.
2. You must achieve 30 points out of a possible 36 points to pass each PBL. A score of 36 points = 100%. A score of < 30 points = not passing.

3. Grading criteria for each category is listed beneath each category.
The better you address the criteria, the more points you will achieve.

Name: Example Date: _____

Instructor _____ Grade _____

<p style="text-align: center;">Known Data</p> <p>55-year-old c/o fatigue & 7-lb weight gain h/o MI 1 year ago has not changed lifestyle works ~60 hours/week consumes high-fat diet unable to stop smoking labored resp = 34bpm crackles in all lung fields occ. irregularity/S3 noted 184/110 3+pitting edema</p>	<p style="text-align: center;">Hypotheses</p> <p>1. Noncompliance r/t lack of knowledge about treatment regimen. 2. Alteration in nutrition: more than body requirements r/t high-fat diet aeb pt. statement . 3. Decreased cardiac output r/t arterial constriction and cardiac rhythm irregularity aeb 184/110 and occ. S3. 4. Impaired gas exchanged r/t fluid in lungs aeb crackles in all fields.</p>	<p>Has a job/is wo</p>
<p style="text-align: center;">Outcomes</p> <p>1. Pt. will obtain and retain knowledge about treatment regimen by d/c. 2. Pt. will be able to follow a low-fat diet by d/c. 3. Pt. will reveal b/p < 150/90 within 30 minutes of intervention. 3. Pt's cardiac rhythm will stabilize within 1 hour. 4. Pt. will have decreased crackles in lung fields within 45 min.</p>	<p style="text-align: center;">Strategies</p> <p>1. Educate pt. regarding disease process, risk factors, diet, smoking, medications. a. have pt. to return the info to assure understanding 2. Consult dietician ASAP for low-fat diet teaching 3. Administer Lasix 80mg IV now 4. Administer Lopressor 2.5mg IV now 5. Assess lung sounds q 15 minutes</p>	<p>Lea</p> <p>MI Low-fat diet S3</p>

CASE STUDY EXAMPLE

Mr. Gomez, a 55-year-old man, visits his physician because of fatigue and a 7-lb weight gain. He has a history of anterior myocardial infarction a year ago. Since then, he has not changed his lifestyle. He continues to work at least 60 hours a week, consumes a high-fat diet, and has been unable to stop smoking.

Physical examination reveals: labored respirations at 34 breaths per minute; crackles (auscultated) in all lung fields; heart rate 130 bpm, with occasional irregularity and an S3 sound noted; blood pressure 184/110 mm Hg; and 3+ pitting edema in lower extremities. He tells the physician, "I'm just working too hard. I just need some more of those water pills you gave me a while back."

