

**LANCASTER GENERAL COLLEGE OF NURSING AND HEALTH SCIENCES**  
**Cardiovascular Invasive Specialty**

**SYLLABUS**  
**Fall Term**

- I. Title: CIS 220 Rhythm Analysis & 12 Lead ECG
- II. Course Description: The purpose of this course is to prepare the student to recognize and interpret the various features of the electrocardiogram (ECG). Emphasis is placed on ECG patterns and components, cardiac conduction and regulation, normal values of ECG components, SA nodal, AV nodal and ventricular arrhythmias, and disorders of the cardiac conduction system. Practical application of ECG theory incorporated with arrhythmia detection will prepare the student to recognize abnormal conduction patterns of clients in various clinical settings. Content will also review normal cardiac anatomy, waveform nomenclature, electrode placement, vectors, and Einthoven's triangle.
- III. Prerequisite: None
- IV. Placement: Fall Term
- V. Time Allotment: Theory 30 hours
- VI. Faculty: William L. Fisher, RCIS, M.Ed.  
Office: LGCNHS  
Phone: 717-544-4700; Pager: 544-5123, pin #1046
- VII. Credits: Two (2)
- VIII. Evaluation:
- | <u>Theory Grade</u>    | <u>Weight</u> | <u>Time/Date</u> |
|------------------------|---------------|------------------|
| Quizzes                | 30%           | Week 3 & 6       |
| Tests                  | 50%           | Finals Week      |
| Homework/Participation | 20%           | Week 1- 15       |
- IX. Textbooks: Basic Arrhythmias, 6<sup>th</sup> Edition  
(required) Author: Gail Walraven  
Publisher: Pearson
- (Optional): Ekg's Made Easy (1995)  
Author: Barbara Aehlert, RN  
Publisher: Mosby Lifeline

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X. Course Objectives:

By the conclusion of the course the student will:

1. Describe atrio-ventricular synchrony and its significance to cardiac function.
2. Given an ECG rhythm strip example for interpretation, the learner will apply a systematic process.
3. Given an ECG rhythm strip example for interpretation, the learner will correctly identify the following rhythms: sinus, atrial, junctional, heart blocks and ventricular.
4. Demonstrate proper lead placement.
5. Given a 12 lead example, the learner will determine the electrical axis of the heart.
6. Given a 12 lead example, the learner will correctly identify the following 12 lead findings: normal, bundle branch blocks, hypertrophies and myocardial infarction patterns.

XI. Program Policies: Students are held accountable for all policies in the Student Handbook and any revisions made to those policies during the academic year.

XII. Class:

A. Importance of Attending Class

Cardiovascular education comprises more than just private reading and passing of exams. Students should recognize that active and informed participation in class is essential to the development of their intellectual abilities and scholarly growth. Students must also recognize the importance, for both the present and the future, of achieving an academic record that reflects their intellectual ability. Such records are seldom achieved without regular attendance and participation in class activities. Attendance will be taken.

B. Student Responsibility for Missed Material

Students are responsible for all material presented and announcements made in class, regardless of attendance. It is the student's responsibility to obtain materials and assignments if absent.

C. Unit Examinations

Examinations should only be missed in extenuating circumstances. A student who misses an examination will be

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required to make up the examination on the next day of lecture. Contact the instructor, prior to the next lecture day to make arrangements to take the exam.

A student who misses an examination, regardless of the reason, will have ten percent (10%) deducted from the grade achieved on the exam. Example: The exam is worth sixty (60) points, the student takes the exam and achieves a grade of 52/60. The score of 52 is then decreased by ten percent (10%) or five (5) points, thus the grade on the exam will be 47/60. An alternate examination may be given for the make-up examination.

D. Class Behavior

Once class has started, the instructor has the prerogative not to admit students into lecture. Students will be dismissed from class for any inappropriate behavior.

XIII. Other:

Academic Dishonesty and Plagiarism

Academic dishonesty violates the spirit and purpose of an academic community, and is therefore subject to disciplinary action.

Academic dishonesty includes cheating on examinations and unauthorized duplication of work.

Plagiarism is an act of academic dishonesty. Any work submitted that is not your own is an act of plagiarism. In preparing assignments, you must acknowledge in writing, any use of outside sources or any assistance you received in preparing an assignment.

If an instructor believes that a student has committed an act of academic dishonesty or has plagiarized material, the instructor will award a failing grade for that assignment to the student. If the occurrence is during an examination, the student will receive a zero for that portion of their grade and must leave the room.

If the student disagrees with this decision, the student may follow the grievance procedure.

XIV. Bibliography:

Walraven, Gail. Basic Arrhythmias, 6<sup>th</sup> Edition. Pearson. New Jersey. 2006.

Aehlert, Barbara. EKG's Made Easy. Mosby Lifeline. 1995.

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XV.

CONTENT OUTLINE	HOURS	CONTENT OBJECTIVES THE STUDENT WILL:	RELATED COURSE OBJECTIVE
I. Electrophysiology A. Heart 1. Anatomical properties 2. Blood flow 3. Conduction properties 4. Conduction system	3	<b>Required Readings:</b> Walraven CH. 1, appendix B pgs: 484-491.  <b>Student Activities:</b> Lecture, Overhead transparencies, Chapter review questions	1
II. Waves and Measurements A. Electrical flow B. ECG paper C. Heart rate calculation D. Leads E. Voltage F. QRS complex G. Waveforms		<b>Required Readings:</b> Walraven CH. 2  <b>Student Activities:</b> Lecture, Overhead transparencies, Chapter review questions	
III. Rhythm Analysis A. Rules 1. Heart rate 2. Regularity 3. Waveform measurements 4. Interpretation B. Rhythm strips	2	<b>Required Readings:</b> Walraven CH. 3 Class handout  <b>Student Activities:</b> Lecture, Overhead transparencies, Chapter review questions  Practice	2,3
IV. Sinus Rhythms A. Normal Sinus Rhythm B. Sinus Bradycardia C. Sinus Tachycardia D. Sinus Arrhythmia	3	<b>Required Readings:</b> Walraven CH. 4  <b>Student Activities:</b> Lecture, Overhead transparencies, Chapter review questions	2,3

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CONTENT OUTLINE	HOURS	CONTENT OBJECTIVES THE STUDENT WILL:	RELATED COURSE OBJECTIVE
V. Atrial Rhythms A. Wandering Atrial Pacemaker B. Premature Atrial Complex C. Supra-ventricular Tachycardia D. Atrial Flutter E. Atrial Fibrillation	3	<b>Required Readings:</b> Walraven CH. 5  <b>Student Activities:</b> Lecture, Overhead transparencies, Chapter review questions	2,3
VI. Junctional Rhythms A. Premature Junctional Complex B. Junctional Escape Rhythm C. Accelerated Junctional Rhythm D. Junctional Tachycardia	3	<b>Required Readings:</b> Walraven CH. 6  <b>Student Activities:</b> Lecture, Overhead transparencies, Chapter review questions	2,3
VII. Heart Blocks A. First Degree Heart Block B. Second Degree Heart Block 1) Mobitz I 2) Mobitz II C. Third Degree Heart Block	3	<b>Required Readings:</b> Walraven CH. 7  <b>Student Activities:</b> Lecture, Overhead transparencies, Chapter review questions	2,3
VIII. Ventricular Rhythms A. Premature Ventricular Complex B. Ventricular Tachycardia C. Ventricular Fibrillation D. Idioventricular Rhythm E. Asystole	3	<b>Required Readings:</b> Walraven CH. 8  <b>Student Activities:</b> Lecture, Overhead transparencies, practice ECGs chapters 9 & 10.	2,3

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CONTENT OUTLINE	HOURS	CONTENT OBJECTIVES THE STUDENT WILL:	RELATED COURSE OBJECTIVE
IX. Clinical Complications of Arrhythmias: Myocardial Infarction A. Symptoms B. Ischemic Changes on EKG C. Infarct Locations D. Chamber Enlargement E. Bundle Branch Block F. Electrolyte Imbalances	4	<b>Required Readings:</b> Walraven appendix A, pgs 479- 483  <b>Student Activities:</b> Lecture, Overhead transparencies	5,6
X. 12 Lead Electrocardiography A. Fundamental Rules B. Lead Placement C. Planes D. Vectors E. Axis F. Waves G. Axis deviation	6	<b>Required Readings:</b> Walraven appendix C, pgs 492-522  <b>Student Activities:</b> Lecture, Overhead transparencies	4,5,6

COURSE OUTLINE

Class number / Date	Topic/Material	Teaching Methodology	Student Activity	Learning Outcome(s)/Objectives
1 8/21/06	Chapter 1: Flow of blood through the heart, Conduction properties and conduction systems.	Lecture, Overhead transparencies	Walraven Chapter 1 Review questions in the back of the chapter.	The student will: Describe the flow of blood through the heart Describe how the electrical and mechanical contractions occur. Describe the properties of automaticity.
2 8/28/06	Chapter 2: Electrical flow, ECG paper and calculations Leads and voltage Normal QRS complex.	Lecture, Overhead transparencies	Review Chapter 2 Review questions throughout the chapter.	The student will: Determine the ECG block calculations Define electrical flow. Demonstrate the ability to measure a normal ECG Determine causes for troubleshooting
3 9/11/06	<b>Test #1: First 2 chapters</b>	Written Examination		The student will: Demonstrate knowledge level through written examination on materials presented in lectures 1 through 2.
4 9/18/06	Chapter 3: Rules of arrhythmia's Analyzing rhythm strips	Lecture, overhead Rhythms strips	Chapter 3 review and rhythm strips.	The student will: Demonstrate the ability to analyze normal sinus rhythms and measure PR, P and QRS complexes
5 9/25/06	Chapter 4: Sinus bradycardia, tachycardia and arrhythmia	Lecture, Overhead transparencies Rhythm strips from the chapter	Chapter 4 homework assignment. Homework assignment from the instructor on various components of bradycardia, tachycardia and arrhythmia.	The student will: Define the components and intervals for Bradycardia, tachycardia and arrhythmia. Analyze a variety of rhythms and correctly determine the diagnosis.
6 10/02/06	Chapter 5: Atrial rhythms, atrial flutter, atrial fibrillation, bradycardia, PAC's Atrial pacemakers.	Lecture, Overhead transparencies Rhythm strips from the chapter	Review chapter on atrial rhythms. Review rhythm strips not covered in class and be able to discuss at the next lecture.	The student will: Identify the rhythms covered in class. Discuss the rate, regularity, rhythm, intervals for each rhythm.

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COURSE OUTLINE				
Class number / Date	Topic/Material	Teaching Methodology	Student Activity	Learning Outcome(s)/ Objectives
7 10/9/06	Chapter 6: Junctional Rhythms, PJC's, Junctional escapes, Accelerated and tachycardia.	Lecture, Overhead transparencies, and Rhythms strips	Review rhythm strips in the back of the chapter and be able to discuss in the next class.	The student will: Measure rhythm intervals. Determine the rhythm based on the standard criteria.
8 10/23/06	Chapter 7: Heart blocks, first, second and third degree.	Lecture, Overhead transparencies and rhythm strips.	Review rhythm strips in chapter 7 and perform any homework assigned by the Instructor.	The student will: Determine the PRI, QRS and rate and regularity on all rhythms in this chapter. Determine rhythm based on the given parameters.
9 10/30/06	Chapter 8: Ventricular arrhythmias, V-tach, V-fib, PVC, (multifocal and unifocal)	Lecture, Overhead transparencies and Rhythm strips	Review rhythm strips in the chapter review.	The student will: Determine the rate, regularity, PRI and QRS complex and then determine the rhythm based on the standard criteria.
10 11/6/06	<b>Test #2: Chapters 3-8</b>	Written examination		The student will: Demonstrate knowledge in lectures 3-8.
11 11/13/06	Appendix 12 Lead ECG interpretation	Lecture, Overhead transparencies 12 lead interpretation	Practice 12 lead ECG's given by the instructor	The student will: Demonstrate the ability to understand axis. Demonstrate the ability to have proper lead placement
12 11/20/06	12 Lead ECG continued	Lecture, overhead transparencies	Practice bundle branch blocks and hypertrophy.	The student will: Demonstrate the ability to determine bundle branches and hypertrophy.
13 11/27/06	12 lead continued	Lecture, overhead and rhythm analysis	Practice 12 lead ECG and area of concern.	The student will: Review the 12 lead ECG and make a diagnosis as to which vessel is in jeopardy. The student will then determine the non-q wave, transmural or sub-endocardial infarction site.
14 12/04/06	Review for final examination		Determine the rhythms and the intervals	The student will; Make accurate analysis of the rhythms on the final examination from Chapter 1 – Appendix. D

Classroom Hours: 30

Lab Hours: 0

Clinical Hours: 0

Credits: 2 credit hours