

**NONINVASIVE
CARDIOVASCULAR TECHNOLOGY PROGRAM**

**OAKLAND COMMUNITY COLLEGE
HIGHLAND LAKES CAMPUS
1991**

COVER SHEET

NEW PROGRAM

NEW TITLE: Noninvasive Cardiovascular Technology

CODE: NCT NUMBER OF CREDITS: _____

Originator: Dee Scherer, CMA AC, CCVT
Campus: Highland Lakes
Date: 1-31-91

Campus Department: Allied Health Mary Bogucki
Date: 2-5-91 Mary Bogucki

Results of College Coordination: Endorsement attached: YES
of Ballots: 10 List attached
of Ayes: 10
of Nays: 0

Advisory Committee: YES Documentation: YES
(Attachment)

CAMPUS CURRICULUM [Signature] DATE: 02-18-91

of Ballots: 6 List of voters attached
of Ayes: 6
of Nays: _____

CAMPUS ADMINISTRATION: [Signature] DATE: 2-26-91

COLLEGE CURRICULUM _____ DATE: _____
of Ballots: _____
of Ayes: _____
of Nays: _____

ACADEMIC SENATE: _____ DATE: _____

CHANCELLOR: _____ DATE: _____

Ballotted: (10)

HIGHLAND LAKES CAMPUS:

Mary Bogucki
Robert Montgomery
Kay Fortin
Leroy Salowich
Lynn Reed
Theresa Wangler (S/field)
L. Kellmenson (S/field)
A. Craigmile
V. Kloosterhouse
D. Scherer

CAMPUS CURRICULUM:

K. Grill
R. Spainhour
D. Knapp
M. Moran
K. Burdette
M. Bogucki
R. Grass

**OAKLAND COMMUNITY COLLEGE
NONINVASIVE CARDIOVASCULAR PROGRAM**

MAJOR REQUIREMENTS:

NCT 114 ^L	Introduction to Cardiovascular Technology	3 credits
NCT 115 ^L	Cardiovascular Pharmacology	3 credits
MDA 157	Basic Electrocardiography	3 credits
MDA 158	Intermediate Electrocardiography	3 credits
NCT 123	Introduction to Echocardiography	3 credits
NCT 124	Advanced Electrocardiography	3 credits
NCT 134	Noninvasive Clinical I	2 credits
NCT 135	Intro to Invasive CVT	3 credits
NCT 200	Echocardiography I	3 credits
NCT 201	Echocardiography Clinical I	4 credits
NCT 210	Echocardiography II	4 credits
NCT 211	Echocardiography Clinical II	4 credits
NCT 221	Echocardiography Externship	4 credits
		= 42 credits

REQUIRED SUPPORTIVE:

ENG 151*	English I	3 credits
ENG 211*	Technical writing	3 credits
PSY 251*	Introduction to Psychology	3 credits
BIO 163	Anatomy and Physiology I	4 credits
BIO 164	Anatomy and Physiology II	4 credits
MAT 115*	Intermediate Algebra	4 credits
PER 158	CPR Basic Life Support	1 credit
MED 110.3	Medical Terminology	3 credits
CHE 100	Introductory Chemistry	4 credits
		= 29 credits

This CORE (first year) is from September to August 20th.
Second year Noninvasive specialty (echo) begins in the Fall through Spring.

1. It is recommended that all Required Supportive Courses be taken prior to admission to the Noninvasive Cardiovascular Program.

General Education Requirements: See graduation requirements for an Associate in Applied Science Degree.

*General Education courses listed as Required Supportive may be used to meet requirements of the General Education component.

NEW PROGRAM DEVELOPMENT

1. PROGRAM TITLE; NONINVASIVE CARDIOVASCULAR TECHNOLOGY
2. PROPOSED PROGRAM CODE; CVT
3. TOTAL NUMBER OF CREDITS IN PROGRAM;
4. TARGET DATE FOR FIRST OFFERING; FALL, 1991

5. PROGRAM DESCRIPTION; Noninvasive cardiovascular technology is an allied health profession specifically concerned with the diagnosis of cardiovascular disease. The noninvasive cardiovascular technologist is a professional who is highly skilled in the operation of a variety of cardiac ultrasound technology equipment, and in obtaining clinical histories, cardiac-related physical findings and other pertinent laboratory data in order to adapt the imaging techniques to obtain comprehensive and diagnostic echocardiographic information. Other noninvasive modalities include electrocardiography, exercise stress testing, ambulatory monitoring (DCG/Holter), vectorcardiography, phonocardiography, external pulse tracings and apexcardiography.

The noninvasive cardiovascular technology program is combined with the invasive cardiovascular program requirements for the first three quarters, providing a fundamental core of cardiac theory and skills. This facilitates maximum adaptability of graduates to this rapidly changing technological field.

Students specialize in the second year of the program. They learn to perform high quality noninvasive cardiovascular tests in affiliated clinical sites with qualified on-site trainers.

This program leads to an Associate Degree in Applied Science and is designated as an Extended Associate Program in that the student must complete in excess of 72 credit hours.

Noninvasive cardiovascular technologists could find employment in hospitals, clinics and cardiac specialists' offices. NCT's are involved in one of the most dynamic and challenging specialties in health care. Students will be eligible to write their Registry examination as given nationally by the Cardiovascular Credentialing Institute (CCI), upon graduation.

6. PROGRAM NEED STATEMENT;

Marty Orłowski and June Martin have survey results documenting a strong need for this NCT program. Some additional remarks are as follows:

1. We Anticipate an increased need because of aging population
2. Historically the growth is 100% every 2 1/2 years.
3. 80% of hospitals indicate a need to replace NCT's by 1995
4. 98.8% will be hiring 2 NEW NCT's next year. The responses were from hospitals in the following counties:
Wayne, Macomb, Oakland, Genesee, Lapeer,
Livingston and Washtenaw.
4. Employees need a source of study to prepare for the national Registry examination (CCI) (2/3% now require this)
5. The fastest growing medical specialty demands trained personnel.
6. Need for a credited program in NCT in the northern suburbs
7. Fulltime and parttime positions are available in hospitals.

92.3% (9 out of 10) hire Noninvasive CVT's
157 fulltime 44 parttime

8. Several hospitals have offered to affiliate with OCC and take NCT students during clinical observation and externships. Many of their credentialed employees have offered to be Adjunct faculty in their specialties.
9. Cost per credit hour is attractive because other existing courses are VERY costly.

Out of 27 surveys to hospitals, 24 have sent responses and 18 out of 24 (75%) indicated support and need for this program.

** Please see attachment A (Dr. Pinsky's letter)

Anticipated additional staff: Fulltime Faculty CCVT/RCT
Adjunct MDA/RN/CVT/RCT
Lab assistant
Part-time secretary (HH 207)

Anticipated capital outlays: See attachment

1. Echocardiograph machine (lease is available on per month basis)
\$2200.00 a month for basic echo
\$4500.00 a month for colorflow
(second year students)

New Hewlett Packard *Introspect 30,000*
Echocardiograph machine: Sonos 100 - \$60,000.00
Holter monitor system: \$11,000.00
EKG machines (2) 3 channel (1 with readout capabilities)
and Holter cables for reading Holter \$10,000.00
Treadmill with EKG readout \$10,000.00
Holters (2) \$975.00 each
Image projector (\$2400.00)

Heart simulator (\$600.00)
Video Tapes (Trainex) (\$1,200.00)
Slides/Books (Ciba) (\$400.00)
Bloodpressure monitoring equipment (digital and regular)
Desk, console, chair (\$800.00)
Training arms (\$400.00)
Lab fees: as recommended by Highland Lakes campus

7. **Program Goals and Objectives:** See attachment
Our goal is to apply for Accreditation by the Committee on Allied Health Education and Accreditation (CAHEA) in collaboration with the American Medical Association (AMA). At this time there are only 2 CAHEA accredited CVT programs in the country. Others have made application for on-site visits after successfully completing their Self-Study Report. None of these however are from Michigan. OCC hopes to be the 1st in Michigan.
8. **Program Requirements:**
see attachment B
9. **Current Programs that are similar and offered by OCC?**
DMS offers ultrasonography, but this NCT program offers specialty noninvasive cardiovascular tests - including echocardiography - EKG's, Stress tests (active and passive) Apexcardiography, etc.
10. **What other community colleges or universities offer comparable programs.**
Marygrove College - Detroit, Michigan
No community college offers this program.
Carnegie - Troy Michigan (Certificate program)

CHECKLIST FOR CAMPUS/COURSE PROGRAM ORIGINATORS

 1. Consult with the Dean

- advise
- current forms used
- all required information completed
- form, content, accuracy
- editing and proofreading
- needs assessment (if required or recommended)
- program review (if required or recommended)
- appropriate revisions (if necessary) based on
Advisory Committee recommendations
- appropriate revisions (if necessary) based on
department/college-wide balloting

 2. Advisory Committee (if required or recommended)

- committee input
- committee review

 3. Balloting (College Coordination)

- department balloting
- college-wide balloting or similar departments/areas
of interest

4. Lodge proposal on campus curriculum agenda

5. All necessary cover sheet signatures (approval by the Dean)

It is not necessary that Steps 1 - 5 be followed in any specific order, only in content.


Originator's Signature


Dean's Signature

COVER SHEET

New Courses

New Course Title: Introduction to Cardiovascular Technology

Code: NCT 114

Number of Credits: 3 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays 0

Advisory Committee (if applicable) Yes XX No Documentation XX

Campus Curriculum: [Signature] Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays

(Attach list of voters)

Campus Administration: [Signature] Date 2-26-91

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Introduction to Noninvasive Cardiovascular Technology
2. **Proposed Course Number:** NCT 114
3. **Number of credits for Course:** 3 credits
Group Classification (A or B): A
Contact Hours: 45
4. **Target date for the first offering:** Fall 1991
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: Program Acceptance
Corequisites: MDA 157 CVT 115

This course is an introduction to the field of noninvasive Cardiovascular Technology and the role and studies of the CV Technologist will be presented. The importance of professionalism, legal, ethical behavior, communications and patient interaction is stressed. Cardiovascular terminology is presented.

Course Fee: None

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).
Requirement of the CVT Program.
Require course material for CAHEA accreditation.
Advisory Committee documentation - See Attachment
Needs analysis/review - See Attachment
Additional staff: CVT/RCVT
Anticipated capital outlays - None
LRC materials, supplies (books, journals, AV films, Trainex films
See Attachment C
7. **Attach Course Learning Objectives with student performance goals.** (Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D

8. Are there similar courses offered by O.C.C.?

Yes _____ No X

If yes, explain the distinctions between this course and the others.

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>Required</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:
Fall 1 Winter 0 Spring 0 Summer 0

Sections - One (Highland Lakes Campus)

13. Lecture Hours: 45 Lab Hours: 0
Total Contact Hours: 45 (semester total)

14. Justify the group classification (A or B) based upon established criteria (see instructions).

A classification

Assignments relating to the objectives - including problem solving skills. Teaching strategies require lectures, AV films, and small group projects. The essential academic focus will be on individual student performance of competencies. These competencies are requirements of the CVT ESSENTIALS as written by CAHEA.

OAKLAND COMMUNITY COLLEGE
NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 114 Introduction to Noninvasive Cardiovascular Technology

CREDITS: 3

COURSE DESCRIPTION:

This course is an introduction to the field of noninvasive Cardiovascular Technology and the role and studies of the CV Technologist. The importance of professionalism, legal and ethical behavior and communications and patient interaction is stressed. Cardiovascular terminology is presented.

Upon completion of the course the student will be able to:

1. Describe the CV Program offered by OCC.
2. Describe the jobs available in the CV Technology field and what they are really like.
3. Describe the CV Tech credentialing process and identify professional organizations available.
4. Describe the CV Tech process and essential characteristics of a "professional" CV Tech.
5. Describe his/her own personal goal in the CV Program and CV field.
6. Describe and demonstrate appropriate legal and ethical behavior.
7. Develop an appreciation for the cardiac patients' needs and rights.
8. Identify types of noninvasive, invasive, and peripheral vascular studies and procedures.
9. Identify setups, evaluation, analysis and report on CV studies.
10. Identify common ideas about death, living wills and ethical issues.
11. Write an article on CVT Professionalism.
12. Identify stress and be prepared to evaluate your reactions to outlined stressful situations.
13. List problems and privileges of hospitalized patients.
14. Properly pronounce, define and spell CV related terminology and identify and define related CV anatomy and physiology.
15. Demonstrate Basic Life Support procedures.

COURSE UNITS:

- I. CARDIOVASCULAR TECHNOLOGY
- II. COMMUNICATIONS
- III. PROFESSIONALISM
- IV. ETHICAL AND LEGAL ASPECTS
- V. BASIC SKILLS

DESIGN CRITERIA AND PERFORMANCE GOALS:

The student will:

1. Describe the CVT program at Oakland Community College.
 - P.G. Identify and explain all required courses in the CV Program
 - P.G. Identify and complete all required CVT Program forms.
 - P.G. Identify necessary changes in life style and study habits for successful completion of goals.

2. Describe the jobs available in the CV Technology field and what and where they are.
 - P.G. List CVT jobs presently available in hospitals and clinics/physician's offices.
 - P.G. Identify differences in noninvasive and invasive CVT job opportunities.

3. Describe the credentialing available and the process used for credentialing. Identify professional organizations presently available for qualified CVT's.
 - P.G. Name the National credentialing organization.
 - P.G. List the different credentials available.
 - P.G. Identify professional organizations for the CVT.

4. Describe the CVT process/studies and essential characteristics of a "professional" CV Tech.
 - P.G. List the types of Noninvasive CV studies.
 - P.G. List the Peripheral Vascular studies.
 - P.G. List the characteristics of professional attitudes.
 - P.G. Describe a "team" worker.

5. Describe his/her own realistic, personal goals in the CV Program and as a CVT professional.
 - P.G. Complete written assignment that will identify personal short-term and long-term goals.
 - P.G. Identify and describe "self-care".

6. Describe and demonstrate appropriate legal and ethical behavior.
 - P.G. Define and give examples of medical legal responsibilities of the CVT.
 - P.G. List and define medicolegal terminology for the CVT.
 - P.G. Define ethical decision making process.
 - P.G. Identify legal aspects of charting and miscellaneous form completion requirements.
 - P.G. Identify ethical dilemmas in given medical issues. Example: Right to die, Organ transplants (who gets them)?

7. Identify a cardiac patient's needs and patient's rights.
 - P.G. List and explain the document "Patient's Rights."
 - P.G. List needs and expectations of all patients.
 - P.G. Identify informed consent requirements.
 - P.G. List the patient's fears as a cardiac patient.
 - P.G. Define:
 - interpersonal distance
 - interpersonal closeness
 - nurturing
 - P.G. List the guidelines for CVT patient interaction.
 - P.G. Explain the need for preserving patient's dignity.

8. Identify types of noninvasive, invasive and peripheral vascular studies and procedures.
 - P.G. Define:
 - Electrocardiography
 - DOG recording and scanning
 - Stress testing and why it is done
 - Thallium Stress Tests
 - Serial tracings
 - P.G. Define:
 - Doppler
 - Echocardiography
 - Arteriogram
 - P.G. Define:
 - Cardiac Catheterization
 - Balloon Angioplasty
 - Pacemaker

9. Identify setups, evaluation, analysis and reports on CV studies.
 - P.G. List hospital setups/equipment, supplies used for Stress Tests, DOG's, EKG's, Echocardiograms.
 - P.G. List charting terms for ordering CVT tests.
 - P.G. Identify other hospital personnel/departments involved when performing noninvasive/invasive testing.
 - P.G. List types of hospital-forms required on the chart.
 - P.G. List types of analysis and reports expected on the patient's charts following CV tests.

10. Identify common ideas about death, living will, and current issues regarding AIDS, Euthanasia, Resuscitation.
 - P.G. List generalizations regarding suffering in dying.
 - P.G. List the psychological aspects of dying.
 - P.G. Identify Elizabeth Kubler-Rosses five stages (or responses) of dying persons.
 - P.G. Define:
 - Living Will
 - AIDS
 - Euthanasia
 - Death
 - P.G. Explain his/her emotions regarding "Do not resuscitate".
 - P.G. Explain his/her attitude about death.
 - P.G. Explain his/her attitude about a terminally ill and/or dying patient.
 - P.G. Explain his/her emotions when the patient dies during the procedure.

11. Write an article on Professionalism.
 - P.G. Prepare a collage on him/herself - (past and present).
 - P.G. Demonstrate through role-playing non-professional and then professional behavior to a give situation.

12. Identify stress and be prepared to evaluate one's own reactions to outlined stressful situations.
 - P.G. List type A and type B behaviors.
 - P.G. List stressful situations for the student.
 - P.G. Outline how some people handle stress.
 - P.G. Define: Distress

13. Describe some problems and privileges of hospitalized patients.
 - P.G. List problems some hospitalized patients encounter.
 - P.G. Describe how those problems could have been avoided.
 - P.G. Describe how to "spot" a potential problem area/situation and take action to avoid it.
 - P.G. List problems some patients cause themselves.
 - P.G. Define: Privilege
 - P.G. List one of the patient's privileges.

14. Properly pronounce, define and spell CV related terminology and completely identify in-depth material related to the anatomy and physiology of the cardiovascular system and CVT testing.
 - P.G. Define, spell and pronounce CV terminology.
 - P.G. Properly identify and define CV anatomy, physiology, and blood flow within the heart and heart and through coronary arteries.
 - P.G. Describe the cardiac anatomy (handout).
 - P.G. Describe cardiac physiology including Einthoven's Triangle, Theory and law and how it relates to the EKG.

15. Properly demonstrate knowledge of Basic Life Support.
 - P.G. Demonstrate proper one man CPR.
 - P.G. Demonstrate proper two man CPR.
 - P.G. Demonstrate proper emergency response when patient is choking.
 - P.G. Demonstrate successful completion in BLS from AHA. (card)

COVER SHEET

New Courses

New Course Title: Cardiovascular Pharmacology

Code: NCT 115

Number of Credits: 3 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 9 No. of Nays 0

1 abstention

Advisory Committee (if applicable) Yes XX No Documentation XX

Campus Curriculum: [Signature] Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays

(Attach list of voters)

Campus Administration: [Signature] Date 2-26-91

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Cardiovascular Pharmacology
2. **Proposed Course Number:** NCT 115
3. **Number of credits for Course:** 3 credits
Group Classification (A or B): A
Contact Hours: 45
4. **Target date for the first offering:** Fall 1992
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: Acceptance into the program.

Corequisites: NCT 114 MDA 157

This course is designed to provide the student with a basic understanding of cardiac drug therapy, including the legal, technical, ethical and moral aspects of handling medications. The purpose of this course is to provide an overview of the responsibilities involved when medications are administered or prescribed for the cardiac patient.

Course Fee: \$30.00

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).
Requirement of the CVT Program.
Requirement for CAHEA Accreditation
Advisory Committee documentation - See Attachment
Needs analysis/review - See Attachment
Additional staff: Adjunct (RN)
Anticipated capital outlays - Training arms (arteries/veins)
LRC materials, supplies (books, journals, AV films, Trainex films)
7. **Attach Course Learning Objectives with student performance goals.** (Include reading, writing, speaking, listening and critical thinking objectives and goals.)
See Attachment D

8. Are there similar courses offered by O.C.C.?

Yes _____ No X

If yes, explain the distinctions between this course and the others.
There are other medications/pharmacy courses offered but are not specific to the needs of the cardiovascular technologist.

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>REQUIRED</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. n/a

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:
Fall 1 Winter 0 Spring 0 Summer 0

Sections - One (Highland Lakes Campus)

13. Lecture Hours: 45 Lab Hours: 0
Total Contact Hours: 45 (semester total)

14. Justify the group classification (A or B) based upon established criteria (see instructions).

B classification

Assignments relating to the objectives - will require intensive student-instructor interaction in a smaller class size. The essential academic focus will be on individual documentation of knowledge of this material as well as student performance of competencies. These competencies are requirements of the CVT ESSENTIALS as written by CAHEA.

OAKLAND COMMUNITY COLLEGE
NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 115 CARDIOVASCULAR PHARMACOLOGY

CREDITS: 3

COURSE DESCRIPTION:

Medication administration for the cardiovascular technician is designed to provide the student with a basic understanding of cardiac drug therapy, including the legal, technical, ethical and moral aspects of handling medications.

The purpose of this course is to provide an overview of the responsibilities involved when medications are administered or prescribed for the cardiac patient.

Upon completion of this course the student will be able to:

1. Identify types of drugs used.
2. Identify sources of drugs.
3. Relate drug legislation to the handling, storage, and use of medications for the cardiac patient.
4. Demonstrate proper documentation procedures for use of medications.
5. Identify safety measures and policies necessary for the responsible inventory, storage and handling of medications.
6. Demonstrate proper use of reference materials.
7. Integrate knowledge of drug therapy with total patient care:
 - a. relate drug therapy to disease process
 - b. evaluate effectiveness of drug therapy
 - c. identify patient learning needs in relationship to drug therapy
 - d. have knowledge to provide patient with pertinent information relevant to the patient drug therapy
 - e. evaluate relevant lab data in relationship to patient drug therapy
8. Define related terms and abbreviation.
9. Interpret component parts of the prescription:
 - a. superscription
 - b. inscription
 - c. subscription
 - d. signature
10. Define and demonstrate the seven "rights" of medication administration.
11. Define modes of drug delivery (stock supplies, unit dose).
12. Be provided with formulas and practice to accurately calculate drug doses.
13. Describe process of drug absorption, distribution, metabolism and elimination.
14. Describe techniques to properly administer medications.
15. Define various drug classifications.
16. Identify drug actions, side effects and precautions common to specific drug classifications.

17. Recognize classifications, therapeutic actions, side effects and precautions of the most frequently prescribed medications.
18. Identify routes for medication administration.

COURSE OUTLINE

UNIT I	ORIENTATION TO MEDICATIONS
UNIT II	FUNDAMENTALS OF MEDICATION THERAPY
UNIT III	DOSAGE CALCULATIONS
UNIT IV	RECORD KEEPING
UNIT V	INTRO TO CARDIAC PHARMACOLOGY
UNIT VI	CODE PROCEDURES AND DRUGS

DESIGN CRITERIA AND PERFORMANCE GOALS:

ORIENTATION TO MEDICATIONS

The student will:

1. Identify drug references and naming.
2. Identify body processes affecting drug action.
3. Identify factors influencing drug action and metabolism.
4. Recognize and identify side effects of drugs.
5. Recognize and identify adverse reactions to drugs.
6. Know laws relating to drugs.
7. Recognize and identify controlled substances.
8. Identify drug dependency problems.
9. Identify commonly misused drugs.
10. Recognize responsibility toward drug abuse.

FUNDAMENTALS OF MEDICATION THERAPY

The student will:

1. Prepare forms and preparations of medications.
2. Demonstrate proper drug storage.
3. Identify routes of drug administration.
4. Know laws regarding administration by parenteral route.
5. Know common drug abbreviations.
6. Recognize common drug orders.
7. Identify the nine parts of any drug order.
8. Identify standing and terminating orders.
9. Identify problems and actions in unclear drug orders.

DOSAGE CALCULATIONS

The student will:

1. Know abbreviations used in medication orders.
2. Know conversion between unit systems.
3. Be able to calculate dosages.
4. Be able to calculate IV concentrations.
5. Know mixture of IV medications.
6. Be able to calculate IV drip rates.
7. Be familiar with standard types of IV equipment.

RECORD KEEPING

The student will:

1. Recognize single dose and multiple dose packaging.
2. Demonstrate opening and dispensation of IV med containers.
3. Properly set up medicine carts and trays.
4. Demonstrate how controlled substances are stored and accounted for.
5. State the five rules for giving medications.
6. Demonstrate proper charting of medications given.
7. Demonstrate POMR and SOAP methods of charting.
8. Demonstrate correct principles of charting.
9. Demonstrate how to report medication errors.

INTRO TO CARDIAC PHARMACOLOGY

The student will:

- P.G. Complete drug cards for a cardiac patient in each class.
- P.G. Describe for a drug in each class: expected action, indication, route of administration and mode of action.
- P.G. Describe the action of the various sympathetic receptor sites.
- P.G. Identify a drug which affects each receptor site.

CODE PROCEDURES AND DRUGS

Standard Emergency Cardiac Drugs Expected To Know:

Oxygen
Sodium Bicarbonate
Epinephrine
Atropine
Lidocaine
Procainimide
Bretylium
Verapamil
Dopamine
Isoproterenol
Inderal(propranolol)
Nitroglycerine
Heparin
Digitalis
Lasix(furosemide)

COVER SHEET

New Courses

New Course Title: Introduction to Echocardiography

Code: NCT 123

Number of Credits: 3 credits

Originator: Dee Scherer

Campus: H/Lakes

Date: 1-31-91

Campus Department

Allied Health

Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays 0

Advisory Committee (if applicable) Yes XX No Documentation XX

Campus Curriculum:

Steve Grass

Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays

(Attach list of voters)

Campus Administration:

Richard Saunders

Date 2-26-91

College Curriculum: _____

Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____

Date _____

Chancellor: _____

Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Introduction to Echocardiography
2. **Proposed Course Number:** NCT 123
3. **Number of credits for Course:** 3 credits
Group Classification (A or B): B
Contact Hours: 60
4. **Target date for the first offering:** Winter 1992
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: NCT 114 NCT 115 MDA 157
Corequisites: MDA 158 NCT 124 PER 158

This course is an introduction to the basic principles and application of physical assessment and echocardiographic procedures. The physical principles, anatomy and clinical applications of cardiac ultrasound are emphasized.

Course Fee: \$ 75.00

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).

Required Course for CVT Program

Required course material for CAHEA Accreditation

Advisory Committee documentation - See Attachment A

Needs analysis/review - See Attachment

Additional staff: RCT/CVT

Lab assistant for

student-instructor ratio as required by CAHEA

Anticipated capital outlays -

Echocardiograph machine (purchase or lease)

LRC materials, supplies (books, journals, AV films, Trainex films)

7. **Attach Course Learning Objectives with student performance goals.** (Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D

8. Are there similar courses offered by O.C.C.?

Yes _____ No X

If yes, explain the distinctions between this course and the others.
This is a CVT specialty course. See attachment (F) letter from
Dr. W. Pinsky, CVT Program Advisor.

9. What other community colleges or universities offer comparable courses?

Marygrove College, Detroit, Michigan
Carnegie - Troy Michigan 1 year non-credit course

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area	<u>Elective</u>
Associate in Science	Area	<u>Elective</u>
Associate in Business	Area	<u>Elective</u>
Associate in Applied Science	Area	<u>REQUIRED</u>
Associate in General Studies	Area	<u>Elective</u>

General interest class not intended to meet
graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge
these prerequisites provide. The co-requisites are necessary
for proper sequencing of courses. CVT courses will be offered
only once-a-year.

12. Number of projected sections of course:

Fall 0 Winter 1 Spring 0 Summer 0

Sections - One (Highland Lakes Campus)

13. Lecture Hours: 30 Lab Hours: 30

Total Contact Hours: 60 (semester total)

14. Justify the group classification (A or B) based upon established criteria
(see instructions): B

Assignments relating to the objectives - including skill building will
require intensive student-instructor interaction. The essential academic
focus will be on individual student performance of competencies. These
competencies are requirements of the CVT ESSENTIALS as outlined
by the Committee on Allied Health, Education and Accreditation Association
(CAHEA).

NCT 123 INTRO TO ECHOCARDIOGRAPHY

COURSE DESCRIPTION:

Introduction to the basic principles and application of physical assessment and the echocardiographic procedures. The physical principles, anatomy and clinical applications of cardiac ultrasound are emphasized.

COURSE OUTLINE:

- UNIT 1 PHYSICAL ASSESSMENT
- UNIT 2 ABNORMALITIES OF THE HEART SOUNDS
- UNIT 3 ASSESSMENT OF HEART MURMURS AND EXTERNAL PULSE RECORDINGS
- UNIT 4 PHYSICAL PRINCIPLES AND INSTRUMENTATION OF ULTRASOUND
- UNIT 5 TOMOGRAPHIC ANATOMY, NOMENCLATURE STANDARDS AND MYOCARDIAL WALL SEGMENTS
- UNIT 6 CLINICAL OBSERVATION OF ECHOCARDIOGRAPHY
- UNIT 7 CLINICAL APPLICATION OF ECHOCARDIOGRAPHY

c. Outline bioeffects and safety precautions.

NCT 123 Continued

4. Identify standard two-dimensional echocardiographic views and label anatomy:
 - p.g. Identify the cardiac chambers, great vessels and major structures on models provided.
 - p.g. Document location of: anterior aspect of the heart
diaphragmatic aspects of the heart: cardiac valves,
internal right atrium, internal right ventricle
internal left atrium, internal left ventricle.
5. Document Tomographic sections of the heart by identifying: cardiac chambers, great vessels and major structures of the heart on line-drawings and actual Two-dimensional echocardiographic images of the following specific areas:
 - parasternal long axis LV< RV inflow and RV outflow, RV & LV inflow: short axis apex, papillary muscle, mitral valve, LV outflow, great arteries, pulmonary bifurcation.
 - Apical four chamber, with & without aorta: apical two chamber.
 - Apical long axis.
 - Subcostal long axis inferior vena cava, four chamber, short axis apex to base.
 - Suprasternal long axis aorta, short axis aorta
(checkoff sheets provided to document proficiencies for each).
6. Apply the principles of Doppler echocardiography in the assessment of cardiac flow patterns, laminar and disturbed.
 - p.g. Identify myocardial wall segments on a line-drawing of the heart in long axis and short axis views.
 - p.g. Prepare results for physician to diagnose.
7. Outline clinical application overview including
 - p.g. Acquired valvular disease, congenital heart disease, CAD, myopathies, pericardial abnormalities.

NCT 123

DESIGN CRITERIA AND PERFORMANCE GOALS:

Student will be able to:

1. Perform a limited physical examination in preparation for phonocardiogram or echocardiogram.
 - p.g. Identify and demonstrate inspection, palpation, and auscultation.
 - p.g. Identify basic pathophysiology affecting heart sounds; demonstrate skills.
 - p.g. Identify the portion of the cardiac cycle in which cardiac events identified through inspection and palpation are occurring at the following areas: sternoclavicular, aortic, pulmonic, RV, apical, epigastric.
 - p.g. Perform an examination of the peripheral circulation for the following:
vasoconstriction, vasodilation, general cyanosis, arterial pulses and venous pulsations.

2. Identify and document abnormalities of the Heart Sounds
 - p.g. Identify normal and abnormal heart sounds at the following locations:
sternoclavicular area, aortic, pulmonic, RV, apical and epigastric areas.
 - p.g. Classify systolic and diastolic murmurs according to: timing, loudness/intensity, location, radiation, frequency/pitch, configuration.
 - p.g. Identify and document external pulse recordings/normal and abnormal.

3. Apply the principles of ultrasonic instrumentation to obtain images of phantoms.
 - p.g. Apply the physical principles of ultrasound to image calibration phantoms.
 - p.g. Prepare and identify the following ultrasound instrumentation for operation:
M-mode (single crystal)
Two-dimensional (mechanical and electronic)
Doppler (pulsed & continuous wave)
 - p.g. Adjust echocardiograph controls for optional imaging of a fellow student from the parasternal border time gain curve (check off sheet provided).
Pre and post-processing, master gain, reject or compress depth settings, sector angle.
 - p.g. Prepare Doppler echocardiograph for operation
 - a. Adjust Doppler echocardiograph controls for optimal sampling of flows through the atrioventricular and semilunar valves.
 - b. Demonstrate proper use of transducers.

COVER SHEET

New Courses

New Course Title: Advanced Electrocardiography

Code: NCT 124

Number of Credits: 3 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health Mary Bogucki

Date 2-5-91 Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays 0

Advisory Committee (if applicable) Yes XX No Documentation XX

Campus Curriculum: Stettin Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays

(Attach list of voters)

Campus Administration: Richard Saunders Date 2-26-91

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** **Advanced Electrocardiography**
2. **Proposed Course Number:** **NCT 124**
3. **Number of credits for Course:** **3 credits**
Group Classification (A or B): **B**
Contact Hours: **60**
4. **Target date for the first offering:** **Winter 1992**
5. **Catalog description:** **State the purpose of the Course;**
include prerequisite/corequisite listing; include course fee if applicable;
approximately 50-100 words.

Prerequisites: NCT 114 NCT 115 MDA 157
Corequisites: MDA 158 NCT 123 PER 158

This course introduces the concepts essential in the performance and interpretation of cardiac exercise tolerance testing and Holter monitoring. There will be an introduction to cardiac pacemakers. Students will observe these tests being performed by qualified personnel and complete written reports on a cardiac rehabilitation program for cardiac patients.

Course Fee: **\$ 75.00**

6. **Need for the course.** **(If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).**
Requirement of the CVT Program.
Requirement for CAHEA Accreditation
Advisory Committee documentation - See Attachment A
Needs analysis/review - See Attachment B
Additional staff: Adjunct
Anticipated capital outlays - See Attachment E
LRC materials, supplies (books, journals, AV films, Trainex films
See Attachment C
7. **Attach Course Learning Objectives with student performance goals.**
(Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D

8. **Are there similar courses offered by O.C.C.?**
Yes _____ No X

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan
Carnegie - Troy Michigan 1 year non-credit course

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>REQUIRED</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:
Fall 0 Winter 1 Spring 0 Summer 0

Sections - One (Highland Lakes Campus)

13. Lecture Hours: 30 Lab Hours: 30
Total Contact Hours: 60 (semester total)
This course will be mostly lecture-demonstration in format, with students visiting an affiliated site to observe these tests being performed.

14. Justify the group classification (A or B) based upon established criteria (see instructions). B

Assignments relating to the objectives - including demonstration of skills will require intensive student-instructor interaction. The essential academic focus will be on individual student performance of competencies. These competencies are requirements of the CVT ESSENTIALS written by CAHEA. Students will visit an affiliated CVT lab to observe tests being done by qualified CVT personnel and/or physicians.

OAKLAND COMMUNITY COLLEGE
NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 124 ADVANCED ELECTROCARDIOGRAPHY

COURSE DESCRIPTION:

Introduces the concepts essential in the performance and interpretation of cardiac exercise tolerance testing and Holter monitoring. There will be an introduction to cardiac pacemakers. Students will observe and complete written report on a cardiac rehabilitation program.

COURSE OBJECTIVES:

1. State the indications and contraindications for exercise stress testing. Identify positive-vs-negative findings as documented on the EKG.
2. Describe difference between cardiac reevaluation and cardiac rehabilitation exercise stress test.
3. Identify the Bruce Protocol and any others used in stress tests.
4. Identify/demonstrate the proper hookup for stress testing following the Bruce Protocol.
5. Observe a patient being stress-tested following the Bruce Protocol. Observe and report on patient/technician/physician relationships.
6. Assist in preparing a patient for exercise stress following the Bruce Protocol.
7. Prepare a patient for and perform an exercise stress test following the Bruce Protocol.
8. Assist in Evaluation of EKG recordings obtained during exercise stress testing and identify their significance.
9. Identify medicolegal documents used by physician/facility for necessary authorization/signatures required.
10. State the indications for ordering a DCG (Holter) test. Identify results printed out during scanning the Holter test.
11. Prepare a patient for Holter monitoring.
12. Observe and scan a 24-hour HOLTER recording.
13. Describe the basic functions of a cardiac pacemaker, identify them by their coding system and evaluate their function through noninvasive methods.
14. List the types of equipment used to check efficiency of the implanted cardiac pacemaker.
15. List risks, safety precautions and legal implications when performing exercise stress tests.

DESIGN CRITERIA AND PERFORMANCE GOALS

NCT 124

The student will:

1. State the indications and contraindications for exercise stress testing.
 - a. Identify reasons for exercise stress tests.
 - b. List contraindications regarding the exercise stress tests.
 - c. Identify alternate tests that evaluate the heart other than exercise.
2. Outline differences between cardiac reevaluations and cardiac rehabilitation when performing exercise stress tests.
 - a. Identify criteria for reevaluating a recent MI patient.
 - b. Identify criteria for patient in rehabilitation therapy.
 - c. Explain how serial-tracings are used for comparison.
3. Identify two protocols (including Bruce) used for stress tests.
 - a. List all protocols used from Masters-Two-Step to those presently used in labs.
4. Identify the proper hookup for exercise stress testing using the Bruce Protocol. Demonstrate this hookup.
 - a. Attach electrodes to the patient for monitoring and recording throughout exercise stress test.
5. Observe a patient to have exercise stress test - observe and report on patient/technician/physician relationship.
 - a. Explain the exercise stress test to the patient.
 - b. Obtain all medicolegal required signatures.
 - c. Observe patient.
6. Assist in preparation of stress test.
 - a. Calculate and record the maximum predicted heart rate.
 - b. Set up and calibrate instruments associated with exercise stress testing.
7. Prepare a patient for and perform an exercise stress test following the Bruce Protocol with extern trainer.
 - a. Position the patient on the treadmill or bicycle ergometer.
 - b. Measure and record resting systolic blood pressure.
 - c. Perform and record standing and hyperventilation ECG.
 - d. Monitor and record blood pressure during each stage of the stress test.
 - e. Monitor the physical condition of the patient and alert the attending physician to changes in the patient's appearance, chest pain, electrocardiogram or blood pressure.
8. Assist in the evaluation of EKG recordings and document their significance.
 - a. Identify findings.
 - b. Complete exercise test worksheet (OCC).
 - c. Complete facilities required reporting procedures.

NCT 124 continued

9. Identify medicolegal documents used by physician/facility for stress testing patients.
 - a. Identify "informed" authorization forms.
 - b. List contraindications for requesting signatures from patient prior to testing.
 - c. Hospital protocol when patient refused to sign forms.
10. State the indications when ordering a Dynamiccardiogram (DCG).
 - a. List symptomology initiating the DCG.
 - b. Identify how this differs from the resting EKG.
 - c. Identify positive-vs-negative reasons for the DCG.
 - d. Outline findings possible on the scanned DCG.
11. Prepare a patient for Holter monitoring.
 - a. Explain the Holter monitoring procedure and equipment to the patient so they can understand their participation for accurate results.
 - b. Explain the value and procedure of maintaining the patient diary.
 - c. Attach EKG electrodes to the patient.
 - d. Prepare and activate reel-to-reel recording device or cassette recording device.
12. Observe and scan a 24 hour HOLTER recording.
 - a. Scan, label and log the study for physician interpretation using rapid-scan superimposed ECG full disclosure ECG.
 - b. Identify "sounds" of the shoot-outs/dysrhythmias.
13. Describe the basic functions of a cardiac pacemaker, codes and evaluate their functions noninvasively.
 - a. Identify the pacemaker "spike"; atrial/ventricular.
 - b. Identify which lead (AVR) best reveals the spike.
 - c. Describe unipolar systems vs bipolar systems.
 - d. List reasons for "runaway" fusion beats, hysteresis.
 - e. Define: oversensing, pacemaker-mediated-tachycardia, parallel pacemaker, DDD.
 - f. Give reasons for:
 - diaphragmatic or phrenic nerve stimulation
 - muscle twitch, failure to capture
 - failure to pace, failure to sense
 - pacemaker syndrome, pacing at altered rate
14. List types of equipment used to check efficiency of implanted cardiac pacemaker.

(List all available equipment.)
15. List risks, safety precautions and legal implications involved when performing non-invasive cardiovascular tests.

Identify all risks, precautions and medicolegal implications re stress testing, DCG, Pacemaker checks.

COVER SHEET

New Courses

New Course Title: Noninvasive CVT Clinical

Code: NCT 134

Number of Credits: 2 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health Mary Bogucki

Date 2-5-91 Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays 0

Advisory Committee (if applicable) Yes XX No Documentation XX

Campus Curriculum: Stutt Glass Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays

(Attach list of voters)

Campus Administration: Richard Zander Date 2-26-91

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Noninvasive CVT Clinical
2. **Proposed Course Number:** NCT 134
3. **Number of credits for Course:** 2 credits
Group Classification (A or B): B
Contact Hours: 90 hours required in the clinic
Students will meet instructor as assigned
4. **Target date for the first offering:** Spring/Summer 1992
5. **Catalog description:** State the purpose of the Course;
include prerequisite/corequisite listing; include course fee if applicable;
approximately 50-100 words.

Prerequisites: NCT 114 NCT 115 MDA 157 PER 158
MDA 158 NCT 123 NCT 124

Corequisites: NCT 135

Course Fee: None

The student will be introduced to the clinical environment by spending time in the clinical setting. Time will be spent in an echocardiograph laboratory observing the staff in patient preparation. Imaging time will be provided when appropriate. Scheduled time will be spent in a noninvasive electrocardiographic laboratory observing, assisting or performing ECG, exercise tolerance tests, Holter monitoring and pacemaker checks under the direction of a staff technologist. A clinical consciousness will be developed with emphasis on professionalism, clinical rapport, and patient care. Basic imaging skills are developed by imaging normals within the echocardiographic laboratory. Clinical requirements are defined and discussed. The role of the noninvasive cardiovascular technologist and their job description is evaluated.

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).
Requirement of the CVT Program.
Required for CAHEA Accreditation
Advisory Committee documentation - See Attachment A
Needs analysis/review -
Additional staff: None
Anticipated capital outlays - None
LRC materials, supplies (books, journals, AV films, Trainex film
7. **Attach Course Learning Objectives with student performance goals.**
(Include reading, writing, speaking, listening and critical thinking

8. Are there similar courses offered by O.C.C.?

Yes _____ No X

If yes, explain the distinctions between this course and the others.

9. What other community colleges or universities offer comparable courses?

Marygrove College, Detroit, Michigan

Carnegie, Troy, Michigan

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u> Elective </u>
Associate in Science	Area <u> Elective </u>
Associate in Business	Area <u> Elective </u>
Associate in Applied Science	Area <u> Required </u>
Associate in General Studies	Area <u> Elective </u>

General interest class not intended to meet

graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:

Fall 0 Winter 0 Spring 1 / Summer 1

Sections - One (Highland Lakes Campus)

13. Lecture Hours: _____ Lab Hours: 60

Total Contact Hours: _____ 60 (semester total)

14. Justify the group classification (A or B) based upon established criteria (see instructions).

B classification

Objectives must be completed satisfactorily within the time allowed. Student will be in an affiliated site with trainer at all times. The essential focus will be on individual documentation of knowledge of this material as well as student performance of competencies. These competencies are requirements of the CVT ESSENTIALS as outlined by the committee on Allied Health, Education and Accreditation Association (CAHEA). Assessment will be based on student performance of all assigned skills, as well as completing all requirements of the site and college.

OAKLAND COMMUNITY COLLEGE
NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 134: CVT CLINICAL/PRACTICUM

CREDITS: 2

COURSE DESCRIPTION: CVT CLINICAL PRACTICUM

The student will be introduced to the clinical environment by spending time in the clinical setting. Time will be spent in an echocardiography laboratory observing & assisting the staff in patient preparation. Imaging time will be provided when appropriate. Scheduled time will be spent in a noninvasive electrocardiographic laboratory observing, assisting or performing ECG, exercise tolerance tests, Holter monitoring and pacemaker checks under the direction of a staff technologist. A clinical consciousness will be developed with emphasis on professionalism, clinical rapport, and patient care. Basic imaging skills are developed by imaging normals within the echocardiography laboratory. Clinical requirements are defined and discussed. The role of the noninvasive cardiovascular technologist and their job description is evaluated.

COURSE OUTLINE:

- Unit 1 Clinical orientation and clinical requirements
- Unit 2 Role of the Noninvasive Cardiovascular Technologist in the Hospital and Clinical Environment
- Unit 3 Preparing the Patient for Laboratory Procedures. Log and record patient information. Completing and observing noninvasive cardiovascular procedures in the assigned laboratory under skilled technologist supervision
- Unit 4 Complete calculations and worksheets for the basic non-invasive cardiovascular examinations and basic quantification of M-Mode echocardiogram
- Unit 5 Demonstrate Professional Conduct within the Clinical Setting
- Unit 6 Medical Legal Boundaries and clinical application of Medical Ethics
- Unit 7 Presentation of Clinical Case Studies

COURSE OBJECTIVES

Upon completion of this course the student will be able to:

1. Describe the clinical environment and state the department policies to which he/she is assigned.
2. Complete all paperwork pertinent to the performance of noninvasive cardiovascular procedures routinely performed in the assigned laboratory.
3. Prepare the patient for the noninvasive cardiovascular procedures performed in the assigned laboratory.
4. Demonstrate the ability to apply medical ethics in the clinical setting with emphasis on patient rapport and rights.

5. Perform the basic noninvasive cardiovascular procedures performed in the laboratory assigned under skilled technologist supervision.
6. Present orally, clinical case studies to his/her peers
7. State the clinical requirements and expectations of the student in the clinical setting.
8. State the role of the noninvasive cardiovascular technologist in the hospital and clinic environment.
9. Perform a limited M-mode and Two-dimensional echocardiogram under supervision.
10. Complete calculations and worksheets for the basic noninvasive cardiovascular exams.
11. Demonstrate professional conduct during simulated laboratory experiences.
12. State the medical legal boundaries for the student in the clinical setting.

Design Criteria and Performance Goals

1. **Outline the clinical requirements, expectations and environment of the student in the clinical setting.**
 - p.g. Identify and follow policies of assigned clinical setting.
 - p.g. Outline all basic entry level skills.
 - p.g. Identify professional traits expected.
 - p.g. Maintain accurate records.
 - p.g. Maintain clean work environment.
 - p.g. Maintain lab inventory.
 - p.g. Describe the clinical environment and outline the department policies to which he/she is assigned.

2. **State the role of the noninvasive cardiovascular technologist**
 - p.g. Complete all paper work pertinent to the performance of the noninvasive cardiovascular procedures routinely performed in the assigned laboratory.
 - p.g. Transport patients and equipment.
 - p.g. Maintain isolation skills where needed.
 - p.g. Correctly identify patient and obtain data.
 - p.g. Explain and instruction procedure/s to patient.
 - p.g. Properly position patient for examination.
 - p.g. Prepare and place electrodes/leads correctly.
 - p.g. Prepare equipment for operation.
 - p.g. Perform patient clean-up.
 - p.g. Prepare tracing for interpretation.
 - p.g. Clean diagnostic equipment.

3. **Prepare the patient for the noninvasive cardiovascular procedures performed in the assigned laboratory.**
 - p.g. Apply all medicolegal requirements of the clinic.
 - p.g. Apply medical ethics in the clinical setting with emphasis on patient rapport and patients' rights.
 - p.g. Complete task analysis of procedures observed/performed within the laboratory assignment.
 - p.g. Complete 12 lead electrocardiogram.
 - p.g. Observe and perform stress test with assistance and supervision.
 - p.g. Observe and perform limited M-mode echocardiogram with assistance under supervision.
 - p.g. Observe and perform limited Two-dimensional echocardiogram with assistance under supervision.

4. **Demonstrate Basic Quantification of the M - Mode Echocardiogram**
 - p.g. M-mode echo.
 - p.g. Two-dimensional echo.
 - p.g. Doppler echo.

5. Complete calculations and worksheets for the basic non-invasive cardiovascular examinations.
 - p.g. ECG's.
 - p.g. Stress test.
 - p.g. Holter monitoring.
6. Demonstrate professional conduct during simulated laboratory experiences.
 - p.g. Discuss professionalism in the workplace.
 - p.g. Out line inappropriate behavior vs appropriate behavior.
 - p.g. Prepare sample task analysis & job description for NCVT.
 - p.g. Complete resume as an assignment.
7. State the medical legal boundaries for the student in the clinical setting.
 - p.g. Discuss different aspects in NCVT job descriptions.
 - p.g. Present various legal-FORMS used in clinical settings.
 - p.g. Report on an ethical requirements as a NCVT.
 - p.g. List the NCVT limitations in the clinical setting.
8. Demonstrate knowledge of the clinical approach to cardiovascular diagnosis through oral presentation of case studies.
 - p.g. Report (orally on clinical research/case studies.

COVER SHEET

New Courses

New Course Title: Introduction to Invasive CVT

Code: NCT 135

Number of Credits: 3 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health

Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays 0

Advisory Committee (if applicable) Yes XX No Documentation XX

Campus Curriculum: Putt Mass Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays

(Attach list of voters)

Campus Administration: Richard Sundt Date 2-26-91

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Introduction to Invasive Cardiovascular Technology
2. **Proposed Course Number:** NCT 135
3. **Number of credits for Course:** 3 credits
Group Classification (A or B): B
Contact Hours: 60
4. **Target date for the first offering:** Spring/Summer 1992
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: NCT 114 NCT 115 MDA 157 PER 158
MDA 158 NCT 123 NCT 124

Corequisites: NCT 134

This course will introduce the student to various forms of invasive monitoring. The student will be introduced to various forms of catheterization, setups and care. Emphasis is placed on the basics of hemodynamic monitoring and interpretation, including patient vital signs. An introduction to aseptic technique and infection control is included as well as xray theory, safety and positioning.

Course Fee: \$ 60.00

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).
Requirement of the CVT Program
Required for CAHEA Accreditation
Advisory Committee documentation - See Attachment A
Needs analysis/review - See Attachment B
Additional staff: Adjunct (Invasive)
Lab assistant
Anticipated capital outlays - Cath tray with instruments
gloves, drapes, supplies
for scrubbing techniques
IV stand/supplies
Catheters:
Swan-Ganz catheter
Thermodilution catheter
Training modules/films

7. Attach Course Learning Objectives with student performance goals. (Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D

8. Are there similar courses offered by O.C.C.?

Yes _____ No X

If yes, explain the distinctions between this course and the others.

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>Required</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:

Fall 0 Winter 0 Spring 1 / Summer 1

Sections - One (Highland Lakes Campus)

13. Lecture Hours: 30 Lab Hours: 30
Total Contact Hours: 60 (semester total)

14. Justify the group classification (A or B) based upon established criteria (see instructions).

B classification

Lecture/demonstration for a limited amount of students is mandatory. This introductory course presents many aspects of invasive cardiovascular technology. Students are made aware of them, and document knowledge through checkoff sheets.

OAKLAND COMMUNITY COLLEGE
INVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 135 - INTRODUCTION TO INVASIVE CVT

CREDITS: 3

COURSE DESCRIPTION:

This course will introduce the student to various forms of invasive monitoring. The student will be introduced to various forms of catheterization, arterial line setups, and care. Emphasis is placed on the basics of hemodynamic monitoring and interpretation, including vital signs. An introduction is given to aseptic technique and infection control. It will include an introduction to the cardiac catheterization lab through the study of : x-ray theory, safety, and positioning, angiographic anatomy of the cardiovascular system, and invasive cardiac measurements and calculations.

Upon completion of this course the student will be able to:

1. Demonstrate principles of aseptic technique.
2. Describe the various forms of hemodynamic monitoring.
3. Describe basic hemodynamics.
4. Describe and demonstrate various monitoring equipment.
5. Define and demonstrate electrical safety.
6. Describe and demonstrate radiation safety.
7. Identify and describe use of IV equipment.
8. Define and describe CVP monitoring.
9. Define and describe right heart monitoring.
10. Define and describe arterial pressure monitoring.
11. Define and describe left heart cath hemodynamics.
12. Describe and calculate cardiac output and other calculations.
13. Define and explain history and physics of x-ray.
14. Describe x-ray operation.
15. Describe importance of quality assurance.
16. Describe new radiologic imaging modalities and computerized tomography.
17. Describe radiologic views and anatomy of cardiac x-ray and angiography.
18. Identify cardiac abnormalities on chest films.
19. Define and describe angio-cardiography.
20. Describe history of cardiac catheterization.
21. Identify and describe cath lab equipment.
22. Describe various catheterization techniques.
23. Demonstrate hemodynamic measurements and calculations.
24. Describe applications and complications of cardiac catheterization.
25. Describe other catheterization procedures.
26. Define and describe coronary arteriography.
27. Describe anatomy of coronary arteries.
28. Describe pitfalls of coronary arteriography.

29. Describe abnormalities of the coronary circulation.
30. Define and describe interventional cardiac catheterization.

COURSE UNITS:

- I. HEMODYNAMICS
- II. ASEPTIC TECHNIQUES
- III. X-RAY THEORY
- IV. CARDIAC X-RAY AND ANGIOGRAPHY
- V. CARDIAC CATHETERIZATION
- VI. CORONARY ARTERIOGRAPHY
- VII. INTERVENTION AND SURGERY

DESIGN CRITERIA AND PERFORMANCE GOALS:

The student will:

1. Demonstrate principles of aseptic technique.
P.G. Aseptically scrub, gown and glove.
2. Describe surgical routine.
Describe principles of sanitation.
P.G. Demonstrate aseptic cleanup
3. Demonstrate proper positioning of patient.
P.G. Prep and drape patient
P.G. Setup sterile table
4. Describe duties of OR personnel.
5. Describe basics of hemodynamics.
P.G. Identify and describe physiologic causes of intracardiac hemodynamic events
P.G. Graphically relate phases of cardiac pressure cycle
P.G. Draw and label simultaneous pressure curves showing correct sequence of cardiac events
P.G. Identify and label pressure waves seen on intracardiac pressure curves and state physiologic origin of each
P.G. Identify 6 intracardiac pressure waveforms
P.G. List normal sequence of pressures
P.G. List normal pressure levels for each cardiac chamber
6. Explain and list characteristics of basic EKG and pressure monitoring systems.
P.G. Describe and demonstrate principles of operation of standard fluid filled pressure recording systems
P.G. Correctly set up pressure transducers
P.G. Describe and demonstrate proper calibration terminology
P.G. Identify and describe characteristics of various pressure recording display devices
P.G. Describe and demonstrate recorder calibration
7. Describe and demonstrate electrical safety.
P.G. List and describe problems which electrical microshock can produce
P.G. Describe why cardiac patients are at such risk of microshock
P.G. List important electrical current safety levels
P.G. Describe importance of "good chassis grounding" in all cardiac equipment

- P.G. Identify and explain various unsafe electrical monitoring conditions and how these can be avoided
- P.G. Explain how isolation transformers, ground fault detectors, or battery operated devices can increase patient safety
- P.G. Identify prongs on 3 prong power cable and outlet and state voltages
- 8. Describe and demonstrate radiation safety.
 - P.G. Describe basic parts and principles of operation of fluoroscope
 - P.G. Explain safety hazards of x-radiation in excessive quantities
 - P.G. Identify and explain safety precautions when working around x-ray equipment
 - P.G. Practice electrical and radiation safety
- 9. Observe use of IV equipment on audiovisual film.
 - P.G. Describe methods to aseptically:
 - draw up medications
 - draw up medications onto sterile field
 - P.G. Identify use of four IV cannulation techniques
 - P.G. Explain and compare basic principles of IV therapy
 - P.G. Locate and identify veins commonly used for IV cannulation
 - P.G. Discuss advantages and disadvantages of various cannulation sites
- 10. Define terms used, and discuss rationale, in CVP monitoring.
 - P.G. Convert CVP readings in cm H₂O to mmHG
 - P.G. Demonstrate and explain water method of measuring CVP
 - P.G. Explain how the proximal port of a Swan-Ganz catheter can be used to measure CVP
- 11. Describe right heart monitoring.
 - P.G. Describe how venous blood should be drawn from catheters
 - P.G. Explain how PA blood gas O₂ saturations can be used to estimate adequacy of the patients cardiac output
 - P.G. Identify and describe use of Swan-Ganz catheter and thermodilution catheters
 - P.G. Explain importance of monitoring LVEDP or wedge pressure in the failing heart
 - P.G. Draw and explain concept of LVEDP = LA = PAW = EDPA pressure
 - P.G. Explain how wedge pressure is obtained
 - P.G. Explain significance of PAW pressure and it's uses
 - P.G. Explain how PAW pressure is used to monitor a failing heart
 - P.G. Select and set up equipment for a Swan-Ganz monitoring using principles of aseptic technique
 - P.G. Describe Swan-Ganz insertion techniques
 - P.G. Identify problems associated with Swan-Ganz catheterization, prevention and treatment
 - P.G. Describe hookup of Swan-Ganz catheters for pressure measurement

12. Discuss advantages of invasive arterial pressure monitoring over noninvasive arterial pressure monitoring
 - P.G. Explain and evaluate differences between invasive and auscultatory BP readings
 - P.G. Explain and solve math problems related to vascular resistance and BP
 - P.G. Relate arterial pressures to their associated Doppler tracings
 - P.G. Identify and evaluate eight arterial pulse sites
 - P.G. Discuss advantages and disadvantages of commonly cannulated arterial sites
 - P.G. Identify and explain arterial cannulation equipment and techniques
 - P.G. Explain differences between arterial and venous catheterization and monitoring
 - P.G. Identify and describe operation of the parts of an arterial monitoring line
 - P.G. List, describe, and demonstrate precautions necessary with arterial lines
 - P.G. Identify, describe, and trouble shoot problems associated with arterial lines
 - P.G. List arterial guidelines and describe their rationale
 - P.G. Describe arterial blood sampling techniques from arterial lines
 - P.G. Identify abnormal arterial pressure curves and discuss causes and significance of each
13. Define and describe left heart cath hemodynamics.
 - P.G. Describe duties of a cath lab recording tech
 - P.G. Identify and monitor important hemodynamic events during catheterization
 - P.G. Demonstrate and state importance of communicating important hemodynamic events to the cathing doctor
 - P.G. Identify and describe recording and monitoring equipment used in cath lab
 - P.G. Describe basic pathologies diagnosed by pressure findings
 - P.G. Identify and diagnose abnormal pressure tracings
14. Describe and demonstrate cardiac output and other calculations
 - P.G. Describe principle of valve area measurement
 - P.G. Calculate valve areas for MS and AS

 - P.G. State normal valve areas and evaluate calculated valve area data
 - P.G. Describe physiology of cardiac output
 - P.G. Explain and apply the FICK principle to different systems
 - P.G. Explain how FICK cardiac output is measured in cath lab
 - P.G. Calculate BSA and explain its use in hemodynamic calculations
 - P.G. Define and calculate oxygen values of arterial and

- venous blood
- P.G. List normal resting adult values for cardiac output
 - P.G. Explain limitations and assumptions inherent in FICK
 - P.G. Explain SVO₂ trend meter and it's uses
 - P.G. Solve FICK c.o. problems from cath data
 - P.G. Evaluate location and direction of cardiac shunts using cath pressure and saturation data
 - P.G. Explain indicator dilution principle
 - P.G. Calculate cardiac output from indicator dilution curves
 - P.G. Describe how thermodilution c.o. test is done in cath lab
 - P.G. Describe and solve for LVMF (angiographic c.o.) quantitative LV volume method
 - P.G. Compare and evaluate various methods of measuring c.o.
15. Define and explain the history and physics of x-rays
- P.G. Identify famous names in radiology
 - P.G. Describe atomic structure of matter as related to x-ray generation
 - P.G. Define thermionic emission as related to x-ray
 - P.G. Define electromagnetic principles in relation to x-ray
 - P.G. Describe behavior and properties of x-radiation
 - P.G. Describe the function of standard x-ray equipment
 - P.G. Explain how x-rays are generated
16. Describe x-ray operation
- P.G. Describe the function of the x-ray tube
 - P.G. Explain the importance of technique in x-ray filming
 - P.G. Describe and explain the fluoroscope systems
 - P.G. Describe and explain operation of cine systems
 - P.G. Describe properties of cine film
 - P.G. Describe cine film processing
 - P.G. Identify and describe cine projectors
 - P.G. Define terms dealing with x-ray beams
 - P.G. Explain how x-ray image is effected by Ma, KV, distance, and exposure time
 - P.G. Describe geometry of x-ray image formation
 - P.G. Define rules of accurate image information
 - P.G. Define and describe scatter radiation
 - P.G. Explain purpose of x-ray screens and grids
 - P.G. Define terms dealing with film image
 - P.G. Describe ways to improve poor quality film
17. Describe radiation safety practices.
- P.G. Define units of radiation
 - P.G. Describe safe radiation dose limits
 - P.G. Describe risks of radiation exposure
 - P.G. List factors which can reduce radiation exposure to patient
 - P.G. List factors which can reduce radiation exposure to health workers
18. Define and practice quality assurance
- P.G. Explain the importance of quality assurance
 - P.G. List the three standard radiology QC parameters
 - P.G. Identify QC practices in an x-ray lab
19. Identify and describe new radiologic imaging modalities.
- P.G. Demonstrate digital subtraction angiography

- P.G. Explain advantages and disadvantages of DSA
- P.G. Demonstrate subtraction technique
- P.G. Describe functions of DSA equipment

- 20. P.G. Define terms related to Digital radiography
- Identify and describe computerized tomography.
- P.G. Identify and describe CT equipment
- P.G. Identify and describe fast CT equipment
- P.G. Explain CT theory of operation
- P.G. Demonstrate basic CT image interpretation
- 21. Describe radiologic views and anatomy in cardiac x-ray and angiography.
- P.G. List chest film views: RAO, PA..., Cardiac borders and anatomy
- P.G. List positions of catheters in chambers
- P.G. Describe heart size and shape
- 22. Identify and describe cardiac abnormalities on chest films.
- P.G. Identify:
 - coronary disease
 - valvular heart disease
 - primary myocardial disease
 - basic congenital heart disease
 - pulmonary vasculature and edema
 - pericardial disease
- 23. Describe angio-cardiography.
- P.G. Identify angiographic equipment
- P.G. Give terminology for special procedures
- P.G. Describe techniques of angiography
- P.G. Describe complications of angiography
- P.G. Describe shunts, and identify cardiac chambers and cardiac valves
- 24. Describe history of cardiac catheterization.
- P.G. Identify cath lab equipment
- P.G. Describe various techniques of catheterization
- P.G. List hemodynamic measurements in catheterization
- 25. Perform hemodynamic calculations.
- 26. Describe technique of coronary arteriography.
- P.G. Identify equipment used
- P.G. List technical features of coronary arteriography
- P.G. Describe anatomy of coronary arteries
- P.G. Describe pitfalls in coronary arteriography
- P.G. Describe abnormalities of the coronary arteriography
- 27. Differentiate interventional cardiac catheterization.
- P.G. Describe angioplasty
- P.G. Describe valvuloplasty

COVER SHEET

New Courses

New Course Title: Echocardiography Clinical 1

Code: NCT 201

Number of Credits: 4 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays _____

Advisory Committee (if applicable) Yes XX No _____ Documentation XX

Campus Curriculum: Just Mass Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays _____

(Attach list of voters)

Campus Administration: _____ Date _____

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Echocardiography Clinical 1
2. **Proposed Course Number:** NCT 201
3. **Number of credits for Course:** 4 credits
Group Classification (A or B): B
Contact Hours: 15 hours lecture + 120 hours clinical
4. **Target date for the first offering:** Fall 1992
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: NCT 135
Corequisites: NCT 200

This course will provide hands-on experience in the hospital and clinic environment. Emphasis will be on the development of clinical technique in the utilization of current echocardiographic instrumentation in the evaluation of acquired cardiovascular disease. The student will apply the principles of medical, legal, ethics and professionalism to the patient, physician and other members of the health team. Clinical case reports are required.

Course Fee: \$60.00

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).
Required course for the NVT Program.
See attachments A B C E
7. **Attach Course Learning Objectives with student performance goals.** (Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D
8. **Are there similar courses offered by O.C.C.?**
Yes _____ No X
If yes, explain the distinctions between this course and the others.

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan
Carnegie - Troy, MI

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>Required</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:
Fall 1 Winter 0 Spring 0 Summer 0

Sections - One (Highland Lakes Campus)

13. Lecture Hours: 15 Lab Hours: 120
Total Contact Hours: 135 (semester total)
Clinical converts to 3 contact hours to one credit hour.

14. Justify the group classification (A or B) based upon established criteria (see instructions).
B classification

Smaller classes are required to evaluate each student before they are placed in the affiliated lab for hands-on experience. Clinical time converts to one credit hour.

NCT 201 - ECHOCARDIOGRAPHY CLINICAL I

Credits: 4

COURSE DESCRIPTION:

This course will provide hands-on experience in the hospital and clinic environment. Emphasis will be placed on the development of clinical technique in the utilization of current echocardiographic instrumentation in the evaluation of acquired cardiovascular disease. The student will apply the principles of medical legal ethics and professionalism to the patient, physician and other members of the health team. Clinical case reports are required.

COURSE OUTLINE:

UNIT I	Clinical Orientation, Policy and Procedures
UNIT II	Current Echocardiographic Instrumentation
UNIT III	Logging and Recording of Patient Information
UNIT IV	Preparing the Patient for Echocardiographic Examination
UNIT V	Performing Echocardiographic Examinations
UNIT VII	Presentation of Clinical Case Studies

GENERAL OBJECTIVES

Upon completion of this course the student will be able to:

1. Perform a limited echocardiographic examination under the supervision of a skilled technologist.
2. Recognize and tailor the echocardiographic examination to identify the cardiovascular abnormality present.
3. Demonstrate professional conduct in the clinical setting.
4. Quantitate and qualitatively evaluate the M-mode, Two-dimensional and Doppler echocardiographic examination.
5. Assist the staff technologist in all other noninvasive cardiovascular procedures performed with the lab.

DESIGN CRITERIA AND PERFORMANCE GOALS:

Upon completion of this course the student will:

1. D.C. Assist clinical preceptor in the performance of the echocardiographic examination.
 - p.g. Participate within a clinical assignment following policies of the department assigned.
 - p.g. Complete paper work pertinent to the performance of procedures performed with assigned department.
 - p.g. Prepare the patient for the noninvasive procedures.
 - p.g. Transport patient and equipment.
 - p.g. Maintain isolation skills where needed.
 - p.g. Correctly identify patient and obtain data
 - p.g. Explain and instruct procedures to patient.
 - p.g. Properly position patient for examination.
 - p.g. Prepare and place electrodes/leads correctly.
 - p.g. Prepare equipment for operation.
 - p.g. Perform patient clean-up.
 - p.g. Prepare tracing for interpretation.
 - p.g. Clean diagnostic equipment.
 - p.g. Recognize and tailor the echocardiographic examination to identify the cardiovascular abnormality present.

2. D.C. Demonstrate professional conduct in the clinical setting.
 - p.g. Participate within a clinical assignment following policies of the department assigned.
 - p.g. Complete paper work pertinent to the performance of procedures performed within assigned department.
 - p.g. Maintain accurate records.
 - p.g. Maintain files.
 - p.g. Maintain clean work environment.
 - p.g. Maintain medical law and ethics.

3. D.C. Assist staff technologist in the performance of all other noninvasive C/V procedures performed in the lab.
 - M-Mode
 - Two-dimensional
 - Pulsed Wave Doppler
 - Continuous Wave Doppler
 - Color Flow Doppler (not mandatory)
 - Stress Echocardiogram (not mandatory)
 - Transesophageal Studies (not mandatory)
 - Contrast (not mandatory)
 - p.g. Utilize and understand physical principles of ultrasound in the performance of echocardiographic procedures.
 - p.g. Maintain and practice aseptic techniques.

4. D.C. Quantitate and qualitatively evaluate the M-mode, Two-dimensional and Doppler echocardiographic examination.
 - p.g. Demonstrate understanding of diagnostic and related equipment capabilities and limitations.
 - p.g. Demonstrate ability to distinguish normal from abnormal cardiac pathophysiology.
 - p.g. Identifies disease and modify the exam appropriately.
 - p.g. Evaluate patient's history and symptoms.
 - p.g. Assess data obtained.

COVER SHEET

New Courses

New Course Title: Echocardiography 1

Code: NCT 200

Number of Credits: 3 credits

Originator: Dee Scherer

Campus: H/Lakes

Date: 1-31-91

Campus Department Allied Health

Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays 0

Advisory Committee (if applicable) Yes XX No Documentation XX

Campus Curriculum: *Stut Mass* Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays

(Attach list of voters)

Campus Administration *Richard Sander* Date 2-26-91

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Echocardiography 1
2. **Proposed Course Number:** NCT 200
3. **Number of credits for Course:** 3 credits
Group Classification (A or B): B
Contact Hours: 60
4. **Target date for the first offering:** Fall 1992
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: NCT 135

Corequisite: NCT 201

This course will utilize the fundamentals presented in the first year of noninvasive cardiovascular technology to evaluate acquired cardiovascular disease states. This course will incorporate all forms of noninvasive cardiovascular testing with emphasis on performance and interpretation of M-mode, Two-dimensional and Doppler echocardiography.

Course Fee: \$60.00

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).
Requirement of the CVT Program.
Required by CAHEA for Accreditation
Advisory Committee documentation - see Attachment
Needs Analysis/Review
Additional staff: RCT/CCVT
Anticipated capital outlays - Echocardiography equipment
LRC materials, supplies (books, journals, AV films, Trainex films
See Attachment C
7. **Attach Course Learning Objectives with student performance goals.** (Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D

8. Are there similar courses offered by O.C.C.?
Yes _____ No X
If yes, explain the distinctions between this course and the others.

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan
Carnegie - Troy, Michigan

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>Required</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:
Fall 1 Winter 0 Spring 0 Summer 0

Sections - One (Highland Lakes Campus)

13. Lecture Hours: 60 Lab Hours: 0
Total Contact Hours: 60 (semester total)

14. Justify the group classification (A or B) based upon established criteria (see instructions).
B classification for a limited number of students. Lecture/demonstration format will be used including role-playing AV films, Trainex filmstrips, guest lecturers will be invited.

OAKLAND COMMUNITY COLLEGE
NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 200 - ECHOCARDIOGRAPHY I

Credits: 3

COURSE DESCRIPTION:

This course will utilize the fundamentals presented in the first year of noninvasive cardiovascular technology to evaluate acquired cardiovascular disease states. This course will incorporate all forms of noninvasive cardiovascular testing with emphasis on performance and interpretation of M-mode, Two-dimensional and Doppler echocardiography. Related physician lectures, and laboratory experience are provided. Current enrollment in echocardiography Clinical I (NCT 201) is required.

Upon completion of this course the student will be able to:

1. Independently interpret M-mode, Two-dimensional, and Doppler echocardiograms obtained on patients with acquired cardiovascular disease.
2. Perform an M-mode and Two-dimensional echocardiogram, demonstrating each of the standard views.
3. Explain the pathophysiology and resulting effects on the echocardiogram for each of the acquired cardiovascular diseases.
4. Alter the echocardiographic examination to tailor the examination to the acquired cardiovascular abnormality present.
5. Quantitate the M-mode, Two-dimensional and Doppler echocardiogram.
6. Correlate the echocardiographic examination with other cardiovascular diagnostic procedures.

COURSE OUTLINE

UNIT I	Review Fundamentals of M-mode, Two-dimensional and Doppler Echocardiography
UNIT II	Cardiac Chamber Studies
UNIT III	Hemodynamic Correlates
UNIT IV	Valvular Heart Disease
UNIT V	Coronary Artery Disease
UNIT VI	Cardiomyopathies
UNIT VII	Pericardial Disease
UNIT VIII	Cardiac Masses
UNIT IX	Diseases of the Aorta

NCT 200 ECHOCARDIOGRAPHY I

DESIGN CRITERIA AND PERFORMANCE GOALS:

INSTRUMENTATION

The student will be able to:

1. Calibrate and adjust echocardiograph controls for maximum definition of cardiac chambers, valves and related structures, with assistance from laboratory instructor.
P.G. Demonstrate M-mode
P.G. Demonstrate Two-dimensional
P.G. Demonstrate Doppler - pulsed and continuous wave
2. Utilize the physical principles of ultrasound when making adjustments to the echocardiograph.
P.G. Demonstrate M-mode
P.G. Demonstrate Two-dimensional
P.G. Demonstrate Doppler - pulsed and continuous wave
3. Select the proper frequency and type of transducer to obtain optimal ultrasonic information from various patients with assistance of the laboratory instructor.

ECHOCARDIOGRAPHY EXAMINATION TECHNIQUE

The student will be able to:

1. Explain the procedure in terms easily understood by the patient.
2. Position the patient to obtain standard echocardiographic views.
3. Attach and adjust physiologic monitors for optimal visualization and utilization.
4. Locate, display and record the echocardiographic views on a normal subject with assistance from the laboratory instructor.
5. Locate, display and record derived M-mode sequences on a normal subject with assistance from the laboratory instructor.
6. Identify cardiac anatomy demonstrated in standard two-dimensional echocardiographic views, including myocardial wall segments as defined by American Society of Echocardiography.
7. Complete the SCC Echocardiography worksheet to include both quantitative and qualitative analysis of the echocardiogram.
P.G. M-mode
P.G. Two-dimensional
P.G. Doppler

ACQUIRED CARDIAC DISEASE

1. Assess the hemodynamic function of the heart as demonstrated on the M-mode, Two-dimensional and Doppler echocardiograms.
P.G. Aortic flow
P.G. Pulmonary flow
P.G. Mitral flow

P.G. Tricuspid flow
P.G. Cardiac output
P.G. Regurgitant fraction
P.G. Shunt ratios
P.G. Elevated LV systolic and diastolic pressure
P.G. Elevated RV systolic and diastolic pressure
P.G. Pulmonary hypertension
P.G. Elevated LA pressure
P.G. Elevated RA pressure

2. Identify echocardiographic findings associated with altered electrical activation.
3. Identify echocardiographic findings associated with acquired valvular heart disease.
 - P.G. Mitral valve
 - P.G. Aortic valve
 - P.G. Tricuspid valve
 - P.G. Pulmonary valve
 - P.G. Endocarditis
 - P.G. Prosthetic valves
 - P.G. Calcified mitral annulus
4. Identify echocardiographic findings associated with coronary artery disease.
5. Identify echocardiographic findings associated with diseases of the myocardium.
6. Identify echocardiographic findings associated with pericardial disease.
7. Identify echocardiographic findings associated with cardiac masses.
8. Utilize an understanding of cardiac pathophysiology in the assessment of the echocardiographic findings associated with acquired heart disease.

COVER SHEET

New Courses

New Course Title: Echocardiography 11

Code: NCT 210

Number of Credits: 4 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health

Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays _____

Advisory Committee (if applicable) Yes XX No _____ Documentation XX

Campus Curriculum:

Scott Mass

Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays _____

(Attach list of voters)

Campus Administration:

Richard Sander

Date 2-26-91

College Curriculum: _____

Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____

Date _____

Chancellor: _____

Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Echocardiography 11
2. **Proposed Course Number:** NCT 210
3. **Number of credits for Course:** 4 credits
Group Classification (A or B): B
Contact Hours: 60
4. **Target date for the first offering:** Winter 1992
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: NCT 201
Corequisite: NCT 211

A continued study of cardiac noninvasive diagnostics with emphasis on new developments and on specialty application. This course includes the noninvasive approach to congenital abnormalities, application of color flow imaging and quality control methods. Statistics and research methods are utilized. Related guest lecturers and laboratory experiences are provided.

Course Fee: \$60.00

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).

See attachments A B C E

7. **Attach Course Learning Objectives with student performance goals.** (Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D

8. **Are there similar courses offered by O.C.C.?**

Yes _____ No X

If yes, explain the distinctions between this course and the others.

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan
Carnegie - Troy, Michigan

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>Required</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:
Fall 0 Winter 1 Spring 0 Summer 0

13. Lecture Hours: 30 Lab Hours: 60
Total Contact Hours: 90 (semester total)

14. Justify the group classification (A or B) based upon established criteria (see instructions).
B classification

Smaller classes are required to evaluate each student before they are placed in the affiliated lab for hands-on experience.

OAKLAND COMMUNITY COLLEGE
NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 210 - ECHOCARDIOGRAPHY II

CREDITS: 4

COURSE DESCRIPTION

A continued study of cardiac noninvasive diagnostics with emphasis on the new developments and specialty applications. This course includes the noninvasive approach to congenital abnormalities, application of color flow imaging and quality control methods. Statistics and research methods are utilized. Related physician lectures and laboratory experiences are provided.

COURSE OUTLINE

- | | |
|----------|---|
| UNIT I | Echocardiographic Evaluation of Congenital Heart Disease |
| UNIT II | Recent Advances in M-mode, Two-dimensional and Doppler Echocardiography |
| UNIT III | Statistics, Research and Quality Control in the Noninvasive Cardiovascular Laboratory |
| UNIT IV | Oral and Written Journal Reviews |

GENERAL OBJECTIVES

Completion of this course will enable the student to:

1. Apply the principles of M-mode, Two-dimensional, and Doppler echocardiography in the evaluation of congenital heart disease.
2. Identify and explain the pathophysiology of congenital heart disease as demonstrated on the M-mode, Two-dimensional, and Doppler echocardiograms.
3. Evaluate and report on current journal articles.
4. Demonstrate the skill necessary to perform a complete echocardiographic examination.
5. Independently develop and report on a research/review project.

NCT 210 Echocardiography 11

Upon completion of this course the student will be able to:

- D.C. Apply the principles of M-mode, Two-dimensional and Doppler echocardiography in the evaluation of congenital heart disease.**
 - p.g. Utilize and understand physical principles of ultrasound.**
 - p.g. Demonstrate understanding of diagnostic and related equipment capabilities and limitations.**
 - p.g. Perform appropriate diagnostic quality studies.**
 - p.g. Perform physical assessment.**

- D.C. Identify pathophysiology and modify exam appropriately.**
 - p.g. Recognize need for additional diagnostic and interventional studies.**
 - p.g. Make quantitative and qualitative assessments of data obtained.**
 - p.g. Identify and explain the pathophysiology of congenital heart disease as demonstrated on the M-Mode Two-dimensional and Doppler echocardiograms.**
 - p.g. Explain the pathophysiology related to cardiac pacemakers, atrial and ventricular defects.**

- D.C. Demonstrate a professional approach to performance of the echocardiogram in a clinical simulation environment.**
 - p.g. perform and demonstrate the ability to be a team member.**
 - p.g. deal effectively with all patients.**
 - p.g. adhere to laboratory policies.**
 - p.g. determine and respond to patient's needs.**
 - p.g. communicate effectively at appropriate level.**
 - p.g. maintain confidentiality.**
 - p.g. maintain patient's personal dignity.**
 - p.g. practice personal hygiene.**
 - p.g. display moral character.**
 - p.g. maintain ethical and legal guidelines.**

- D.C. Demonstrate the skill necessary to perform a complete echocardiographic examination.**

- D.C. Independently develop and report on a research/review project.**
 - p.g. collect and organize information regarding cardiac abnormalities.**

- D.C. Assist the staff technologist in all other noninvasive cardiovascular procedures performed within the lab.**

- D.C. Document skills required in equipment maintenance and/ or troubleshooting**
- p.g. Demonstrate understanding of basic biomedical electronics**
- p.g. Recognize normal functions of diagnostic equipment and associated instrumentation**
- p.g. Identify equipment malfunctions when possible**
- p.g. Determine appropriate action to correct malfunctions**
- p.g. Maintain clean work environment**
- p.g. Practice and maintain quality control**
- p.g. Practice all required (OSHA, CLIA, CDC) etc., rules and regulations, and where required, have latest copies of rules and regulations posted.**

COVER SHEET

New Courses

New Course Title: Echocardiography Clinical 11

Code: NCT 211

Number of Credits: 4 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays _____

Advisory Committee (if applicable) Yes XX No _____ Documentation XX

Campus Curriculum: Just Share Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays _____

(Attach list of voters)

Campus Administration: Richard J. Jundt Date 2-26-91

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Electrocardiography Clinical 11
2. **Proposed Course Number:** NCT 211
3. **Number of credits for Course:** 4 credits
Group Classification (A or B): B
Contact Hours: 15 + 120 hours on site = 135
4. **Target date for the first offering:** Winter 1992
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: NCT 200 NCT 201
Corequisite: NCT 210

This course is a continuation of Echocardiography Clinical 1. It will provide hands-on experience in the hospital and clinic environment. Emphasis will be placed on the development of clinical technique in the utilization of current echocardiographic instrumentation in the evaluation of acquired and congenital heart disease. The student will apply the principles of medical legal, ethics and professionalism to the patient, physician and other members of the health team. Clinical case reports are required.

Course Fee: \$60.00

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).

See attachments A B C E

7. **Attach Course Learning Objectives with student performance goals.** (Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D

8. **Are there similar courses offered by O.C.C.?**

Yes _____ No X

If yes, explain the distinctions between this course and the others.

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan
Carnegie - Troy, Michigan

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>Required</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:
Fall 0 Winter 1 Spring 0 Summer 0

Sections - One (Highland Lakes Campus)

13. Lecture Hours: 15 Lab Hours: 120
Total Contact Hours: 135 (semester total)

14. Justify the group classification (A or B) based upon established criteria (see instructions).
B classification

Smaller classes are required to evaluate each student before they are placed in the affiliated lab for hands-on experience. Clinicals require 3 hours for each credit hour not assigned to lecture on campus.

NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 211 - ECHOCARDIOGRAPHY CLINICAL II

Credits: 4

COURSE DESCRIPTION

This course is a continuation of Echocardiography Clinical I. This course will provide hands-on experience in the hospital and clinic environment. Emphasis will be placed on the development of clinical technique in the utilization of current echocardiographic instrumentation in the evaluation of acquired and congenital heart disease. The student will apply the principles of medical legal ethics and professionalism to the patient, physician and other members of the health team. Clinical case reports are required.

COURSE OUTLINE

- UNIT I Clinical Orientation, Policy and Procedures
- UNIT II Current Echocardiographic Instrumentation
- UNIT III Logging and Recording of Patient Information
- UNIT IV Preparing the Patient for Echocardiographic Exam
- UNIT V Clinical Application of Medical Ethics
- UNIT VI Performing Echocardiographic Examinations
- UNIT VII Presentation of Clinical Case Studies

GENERAL OBJECTIVES

Upon completion of this course the student will be able to:

- 1) Perform a limited echocardiographic examination under the supervision of a skilled technologist
- 2) Recognize and tailor the echocardiographic examination to identify the cardiovascular abnormality present
- 3) Demonstrate professional conduct in the clinical setting
- 4) Quantitate and qualitatively evaluate the M-mode, Two-dimensional and Doppler echocardiographic examination
- 5) Assist the staff technologist in all other noninvasive cardiovascular procedures performed within the lab

TIME

TEXT None required all previous reference text recommended

DESIGN CRITERIA NCT 211

Upon completion of this course the student will be able to:

1. D.C. Perform a limited echocardiographic examination under the supervision of a skilled technologist.
p.g. Demonstrate a professional approach to performance of the echocardiogram in a clinical environment

2. D.C. Recognize and tailor the echocardiographic examination to identify the cardiovascular abnormality present.
p.g. Calibrate and adjust echocardiograph controls for maximum definition of cardiac chambers, valves and related structures with supervision from clinical preceptor.
p.g. Utilize the physical principles of ultrasound when making adjustments to the echocardiograph in the clinical environment.
p.g. Select the proper frequency and type of transducer to obtain optimal ultrasonic information

3. D.C. Demonstrate a professional conduct in the clinical setting.
p.g. Maintain personal hygiene
p.g. Demonstrate moral character
p.g. Maintain isolation skills when necessary
p.g. Demonstrate ability to be a team member

4. D.C. Quantitate and qualitatively evaluate the M-mode Two-dimensional and Doppler echocardiographic examination.
p.g. Identify normal and abnormal anatomy demonstrated in standard two-dimensional echocardiographic views.
p.g. Locate, display and record all standard Doppler recording sequences on normal and abnormal subjects.

5. D.C. Assist the staff technologist in all other noninvasive cardiovascular procedures performed within a lab.
p.g. Correlate anatomy, pathophysiology and hemodynamics demonstrated in all procedures performed in the lab.
p.g. Complete:
M-mode
2-D
Doppler

NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 211 - ECHOCARDIOGRAPHY CLINICAL II

Credits: 4

COURSE DESCRIPTION

This course is a continuation of Echocardiography Clinical I. This course will provide hands-on experience in the hospital and clinic environment. Emphasis will be placed on the development of clinical technique in the utilization of current echocardiographic instrumentation in the evaluation of acquired and congenital heart disease. The student will apply the principles of medical legal ethics and professionalism to the patient, physician and other members of the health team. Clinical case reports are required.

COURSE OUTLINE

- UNIT I Clinical Orientation, Policy and Procedures
- UNIT II Current Echocardiographic Instrumentation
- UNIT III Logging and Recording of Patient Information
- UNIT IV Preparing the Patient for Echocardiographic Exam
- UNIT V Clinical Application of Medical Ethics
- UNIT VI Performing Echocardiographic Examinations
- UNIT VII Presentation of Clinical Case Studies

GENERAL OBJECTIVES

Upon completion of this course the student will be able to:

1. Perform a limited echocardiographic examination under the supervision of a skilled technologist.
2. Recognize and tailor the echocardiographic examination to identify the cardiovascular abnormality present.
3. Demonstrate professional conduct in the clinical setting.
4. Quantitate and qualitatively evaluate the M-mode, Two-dimensional and Doppler echocardiographic examination.
5. Assist the staff technologist in all other noninvasive cardiovascular procedures performed within the lab.

TEXT

None required; all previous reference text recommended.

NCT211DES

COVER SHEET

New Courses

New Course Title: Echocardiography Externship

Code: NCT 221

Number of Credits: 4 credits

Originator: Dee Scherer

Campus: H/Lakes Date: 1-31-91

Campus Department Allied Health Mary Bogucki

Date 2-5-91

Mary Bogucki

Results of College Coordination: Endorsement Attached:

No. of Ballots 10 No. of Ayes 10 No. of Nays _____

Advisory Committee (if applicable) Yes XX No _____ Documentation XX

Campus Curriculum: [Signature] Date 2-18-91

No. of Ballots 6 No. of Ayes 6 No. of Nays _____

(Attach list of voters)

Campus Administration: [Signature] Date 2-26-91

College Curriculum: _____ Date _____

No. of Ballots _____ No. of Ayes _____ No. of Nays _____

Academic Senate: _____ Date _____

Chancellor: _____ Date _____

**OAKLAND COMMUNITY COLLEGE
NEW COURSE (AND REVISION) PROPOSAL FORMAT**

1. **Course Title:** Echocardiography Externship
2. **Proposed Course Number:** NCT 221
3. **Number of credits for Course:** 4 credits
Group Classification (A or B): B
Contact Hours: 60
4. **Target date for the first offering:** Spring 1992
5. **Catalog description:** State the purpose of the Course; include prerequisite/corequisite listing; include course fee if applicable; approximately 50-100 words.

Prerequisites: NCT 210 NCT 211

Students will practice clinical skills previously developed through active participation in a noninvasive cardiovascular laboratory. This course is a full time clinical externship and will be completed in an affiliated hospital/clinic. Emphasis of this course is on the clinical skills necessary to the performance and evaluation of the M-mode, Two-dimensional and Doppler echocardiogram. Written reports, review of current literature and attendance at conferences as available are required.

Course Fee: None

6. **Need for the course.** (If applicable: attach Advisory Committee documentation; attach needs analysis and/or program review documentation.) Include anticipated additional staff; anticipated capital outlays; if lab fees required specify the amount as "recommended by campus"; LRC materials, supplies (e.g. books, journals).

See attachments A B C E

7. **Attach Course Learning Objectives with student performance goals.** (Include reading, writing, speaking, listening and critical thinking objectives and goals.)

See Attachment D

8. **Are there similar courses offered by O.C.C.?**
Yes _____ No X

If yes, explain the distinctions between this course and the others.

9. What other community colleges or universities offer comparable courses?
Marygrove College, Detroit, Michigan
Carnegie - Troy, Michigan

10. Where does the course belong within each degree area?

Associate in Liberal Arts	Area <u>Elective</u>
Associate in Science	Area <u>Elective</u>
Associate in Business	Area <u>Elective</u>
Associate in Applied Science	Area <u>Required</u>
Associate in General Studies	Area <u>Elective</u>

General interest class not intended to meet graduation requirements within any degree program. N/A

11. Why are the prerequisites or corequisites necessary?

Students entering this course will require the knowledge these prerequisites provide. The co-requisites are necessary for proper sequencing of courses. CVT courses will be offered only once-a-year.

12. Number of projected sections of course:
Fall 0 Winter 0 Spring 1 Summer 0

13. Lecture Hours: 30 Lab Hours: 60
Total Contact Hours: 90 (semester total)

14. Justify the group classification (A or B) based upon established criteria (see instructions).
B classification

Smaller classes are required to evaluate each student before they are placed in the affiliated lab for hands-on exoerience. This course requires the student to convert each credit hour on the basis of 3 contact hours.

NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 221 - ECHOCARDIOGRAPHY CLINICAL EXTERN

Credits:

COURSE DESCRIPTION

Students will practice clinical skills previously developed through active participation in a noninvasive cardiovascular laboratory. This course is a full-time clinical externship and will be completed in an affiliated hospital/clinic. Emphasis of this course is on the clinical skills necessary to the performance and evaluation of the M-mode, Two-dimensional and Doppler echocardiogram. Written reports, review of current literature and attendance at conferences are required.

COURSE OUTLINE

- | | |
|----------|--|
| UNIT I | Clinical application of noninvasive diagnostic procedures with emphasis on the echocardiographic examination |
| UNIT II | Correlate current literature and new techniques to the clinical setting |
| UNIT III | Presentation of Clinical Case Studies |
| UNIT IV | Clinical application of medical ethics |
| UNIT V | Required conference attendance |

COURSE OBJECTIVES

Upon completion of this course the student will be able to:

1. Function at an entry level in the field of noninvasive cardiovascular technology
2. Independently perform a diagnostic echocardiographic examination
3. Develop and write a research paper utilizing standard research methods and materials

CLASS TIME

Clinical practicum:

NCT 221 ECHOCARDIOGRAPHY CLINICAL EXTERNSHIP

DESIGN CRITERIA AND PERFORMANCE GOALS

Upon completion of this course the student will be able to:

1. D.C. Function at an entry level in the field of noninvasive cardiovascular technology
 - p.g. Calibrate and adjust echocardiograph controls for maximum definition of cardiac chambers, valves and related structures.
 - p.g. Locate, display and record all standard echocardiographic views on normal and abnormal subjects, in a clinical environment, independently but with supervision from the clinical preceptor.

2. D.C. Independently perform a diagnostic echocardiographic examination.
 - p.g. Complete an echocardiographic examination documenting normal and abnormal findings.
M-mode
2-D
Doppler
 - p.g. Document all required findings and relate all clinical findings on required forms.
 - p.g. Correlate current literature and new techniques to the clinical setting as approved by clinical preceptor.
 - p.g. Complete required hospital/clinical charting as approved and required by the clinical preceptor.

3. D.C. Develop and write a research paper utilizing standard research methods and materials.
 - p.g. Collect and organize information regarding cardiac abnormalities and report in a written format all assigned case studies.
 - p.g. Orally present an assigned case study.
 - p.g. Present a detailed written report on required workshops and/or conferences attended.
 - p.g. Maintain a written diary of externship experiences including a brief report on required lectures presented in the hospital and/or clinic.

4. D.C. Maintain medicolegal and ethics required by this profession.
 - p.g. Describe patients' rights.
 - p.g. Maintain patients' confidentiality.

 - p.g. Present copies of forms used in the hospital and/or clinic that require patients' authorization for treatment, release of records, release of a third-party's records, surgery and autopsy.
 - p.g. Outline the AMA's Code of Ethics.
 - p.g. Outline the Osteopathic Code of Ethics.
 - p.g. Describe contracts and how they differ.
 - p.g. Outline the 5 drug classes. Describe the medicolegal requirements for class two drug prescriptions.
 - p.g. Define Medical malpractice.
 - p.g. Define medicolegal terminology as it relates to medical malpractice, including arbitration.

5. D.C. Present the completed extern competency checkoff requirements as required for satisfactory completion of the externship by the date assigned.
 - p.g. Obtain all required signatures.
 - p.g. Sign all required forms.
 - p.g. Successfully complete all requirements by assigned due dates.
 - p.g. Complete all required forms, including documentation of required immunizations and/or blood tests by extern site.

NONINVASIVE CARDIOVASCULAR TECHNOLOGY

NCT 221 - ECHOCARDIOGRAPHY CLINICAL EXTERN

Credits: 4

COURSE DESCRIPTION

Students will practice clinical skills previously developed through active participation in a noninvasive cardiovascular laboratory. This course is a full-time clinical externship and will be completed in an affiliated hospital/clinic. Emphasis of this course is on the clinical skills necessary to the performance and evaluation of the M-mode, Two-dimensional and Doppler echocardiogram. Written reports, review of current literature, and attendance at conferences are required.

COURSE OUTLINE

- UNIT I** Clinical Application of Noninvasive Diagnostic Procedures with Emphasis on the Echocardiographic Examination
- UNIT II** Correlate Current Literature and new Techniques to the Clinical Setting
- UNIT III** Presentation of Clinical Case Studies
- UNIT IV** Clinical Application of Medical Ethics
- UNIT V** Required Conference Attendance

COURSE OBJECTIVES

Upon completion of this course the student will be able to:

1. Function at an entry level in the field of noninvasive cardiovascular technology.
2. Independently perform a diagnostic echocardiographic examination.
3. Develop and write a research paper utilizing standard research methods and materials.

NCT221DES