

Back

See what the student sees...

Course Master: Approved

Resources: Approved

Program Standards: Approved



Course Outline

1.0 IDENTIFICATION

COURSE INFORMATION

| | |
|---------------------------|---------------------------------|
| Subject Code | HSCI |
| Course Name | ECG Theory & Applications |
| Course Code | 10064 |
| Offering Term | Fall 2009 |
| Classification | Foundational |
| Program Code and Name | 728 - Cardiovascular Technology |
| Total Course Hours | 70 |
| Credit Value / Grade Type | 5 |
| Academic Year | 2009/2010 |
| Approving Associate Dean | Lori Koziol |
| Revision Date | June 14, 2009 |

2.0 LEARNING OVERVIEW

SUBSECTION

Course Description Upon successful completion of this course, students will demonstrate theoretical knowledge and practical skills in performing routine electrocardiograms. Students will become familiar with equipment operation and maintenance, trouble shooting, recognition and elimination of artifact and technical errors. They will become familiar with protocols of special procedures and modified ECG testing. Additional ECG procedures will be discussed such as signal-averaged ECG, trans-telephonic monitoring and ambulatory ECG monitoring. Students will also demonstrate suitable skins preparation and Holter hook-up techniques for recording an ambulatory ECG. Legal aspects of informed patient consent, privacy, confidentiality and medical health records will be discussed.

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| Resources | Code or ISBN | Name or Title | Author / Publisher | Version or Edition | Type | Status |
|-------------------------------------------------------------------------|---------------------|------------------------------------------------|------------------------------------------------------|---------------------------|-------------|---------------|
| Status REQ = Required REC = Recommended REF = Reference | 248154 | ECG Theory and Applications | Mohawk College / Mohawk College | | Custom | REQ |
| Type | 0000007351098 | Electrocardiography for Health Care Personnel. | Booth, Kathryn A. / Glencoe/McGraw-Hill | 1 | Text | REQ |
| Online Supply Text Book Custom Courseware | 9781416022442 | Health Professional & Patient Interaction. | Ruth Purtilo. Amy Haddad / Saunders/Elsevier Science | 7th | Text | REF |

Pre-requisite(s)

N/A

Equivalent(s)

N/A

3.0 COURSE CONTENT

MAJOR MODULES, THEMES, OR TOPICS

Electrocardiography

Cardiographic (technical) skills

Assessment of Cardiogram / Electrical Axis

Special Procedure Protocols

Ambulatory Holter Monitoring

Legal and Ethical Aspects

4.0 REFERENCE TO STANDARDS

VS CODE

RELEVANT VOCATIONAL LEARNING OUTCOME

N/A

EE CODE

RELEVANT ESSENTIAL EMPLOYABILITY SKILLS OUTCOME

EE01-A

Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.

EE01-B

Respond to written, spoken, or visual messages in a manner that ensures effective communication.

EE03-A

Apply a systematic approach to solve problems.

EE03-B

Use a variety of thinking skills to anticipate and solve problems.

EE04-A

Locate, select, organize, and document information using appropriate technology and information systems.

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| EE04-B | Analyze, evaluate, and apply relevant information from a variety of sources. |
| EE05-B | Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals. |
| EE06-A | Manage the use of time and other resources to complete projects. |
| EE06-B | Take responsibility for one's own actions, decisions, and consequences. |
| GE CODE | RELEVANT GENERAL EDUCATION THEME |
| | N/A |
| ES CODE | OTHER EXTERNAL STANDARD |
| CA1-C01a | Select electrode sites for 12-lead ECG. |
| CA1-GC01b | Select alternate sites to accommodate patient special needs. |
| CA1-GC01c | Select electrode sites for right-side, posterior and pediatric leads. |
| CA1-GC01d | Utilize esophageal lead, Lewis lead, Frank x, y, and z lead, Fontaine lead, apical lead. |
| CA1-GC01e | Obtain artifact-free and technically-correct tracing. |
| CA1-GC01f | Record ECG. |
| CA1-GC01g | Analyze recording, and relate to patient symptoms and medications. |
| CA1-GC01h | Determine need for additional tracings and / or rhythm strips. |
| CA1-GC01i | Optimize instrument settings to enhance clinical data. |
| CA1-GC01j | Compare current and previous tracings where applicable. |
| CA1-GC01k | Instruct patient in bearing-down vagal manoeuvre. |
| CA1-GC01l | Perform Trendelenburg-position vagal manoeuvre. |
| CA1-GC01m | Perform diving-reflex vagal manoeuvre. |
| CA1-GC01n | Perform deep inspiration / expiration to identify significant Q waves. |
| CA1-GC02a | Select monitor parameters. |
| CA1-GC02b | Select electrode sites for ambulatory ECG. |
| CA1-GC02c | Instruct patient on diary entries relative to symptoms and activities. |
| CA1-GC02d | Obtain trans-telephonic event monitor recordings. |
| CA1-GC02e | Optimize instrument settings to enhance clinical data. |
| CA1-GC05a | Record trans-telephonic tracing. |
| CA1-GC06a | Maintain and troubleshoot electrocardiograph. |
| CA1-GC06b | Maintain and troubleshoot ambulatory ECG recorder / monitor. |
| CA1-GC06c | Maintain and troubleshoot ambulatory ECG analysis systems. |
| CA1-GC06e | Maintain and troubleshoot transtelephonic recorders. |
| CA2-GC01a | Introduce self to patient and family / caregivers. |

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| CA2-GC01b | Explain procedures and respond to questions. |
| CA2-GC01c | Provide reassurance and support to patient. |
| CA2-GC01d | Treat patient with care and compassion. |
| CA2-GC01e | Enhance patient comfort. |
| CA2-GC01f | Display unconditional positive regard toward patient. |
| CA2-GC01g | Maintain patient confidentiality. |
| CA2-GC01h | Respect patient privacy. |
| CA2-GC01i | Maintain patient dignity. |
| CA2-GC01j | Show tolerance and patience when interacting with patients. |
| CA2-GC01k | Maintain professional boundaries in relationship with patient and family / caregivers. |
| CA2-GC01l | Ensure informed patient consent. |
| CA2-GC01m | Respond appropriately to do not resuscitate (DNR) and other patient directives. |
| CA2-GC02a | Verify patient identification and requested procedure(s). |
| CA2-GC02b | Obtain cardiac history and pertinent symptoms. |
| CA2-GC02c | Integrate history and symptoms with procedure ordered. |
| CA2-GC02d | Obtain list of current medications. |
| CA2-GC02e | Obtain history of cardiac surgery and procedures. |
| CA2-GC03a | Assess patient signs and symptoms and act on situations requiring immediate response. |
| CA2-GC03h | Recognize common patient mobility aids. |
| CA2-GC03i | Recognize common patient sensory aids. |
| CA2-GC03j | Recognize common patient monitoring and life-support systems. |
| CA2-GC03k | Ensure that patient aids, monitoring and life-support systems are maintained. |
| CA2-GC03l | Consult physician if patient fails to meet criteria for procedure ordered. |
| CA2-GC03m | Identify life threatening conditions and take appropriate action. |
| CA2-GC03n | Identify conditions requiring physician attention. |
| CA2-GC04a | Assist in patient transfer. |
| CA2-GC04b | Position patient, accommodating special needs. |
| CA2-GC05a | Use standard (universal) precautions. |
| CA2-GC05b | Use isolation and reverse isolation techniques as applicable. |
| CA2-GC05d | Decontaminate and clean equipment and self. |
| CA2-GC08a | Shave body hair. |
| CA2-GC08b | Clean and dry skin. |
| CA2-GC08c | Abrade skin. |

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| | Apply electrodes. |
| CA2-GC08e | Attach leads and ensure integrity. |
| CA2-GC08f | Remove leads and electrodes; clean electrode sites. |
| CA2-GC08g | Assist patient with dressing if required. |
| CA2-GC09a | Record patient demographics, signs and symptoms, non-standard electrode placement and patient positioning. |
| CA2-GC09b | Prepare test results for physician's review. |
| CA2-GC09d | Respond to urgent findings. |
| CA2-GC10a | Advise patient on follow-up to procedure. |
| CA2-GC10b | Advise patient on personal assessment techniques and indications for seeking assistance. |
| CA3-GC01a | Identify and comply with relevant government legislation and regulations. |
| CA3-GC01b | Identify and comply with relevant Code of Ethics. |
| CA3-GC01c | Identify and comply with relevant Scope of Practice. |
| CA3-GC01d | Identify and comply with relevant Standards of Practice. |
| CA3-GC02a | Practice within bounds of job description. |
| CA3-GC02b | Follow institutional and departmental directives. |
| CA3-GC02c | Follow established lines of communication and authority. |
| CA3-GC03a | Maintain personal hygiene and appropriate apparel. |
| CA3-GC03b | Prioritize activities and use time management skills. |
| CA3-GC03c | Accept accountability for decisions and actions. |
| CA3-GC03d | Practice in a manner that is non-prejudicial and that respects diverse cultural, ethnic and religious beliefs. |
| CA3-GC04a | Speak clearly and concisely. |
| CA3-GC04b | Write clearly and concisely. |
| CA3-GC04c | Use terminology appropriate to the purpose and targeted audience. |
| CA3-GC04d | Use and interpret general medical terminology. |
| CA3-GC04e | Use and interpret medical terminology unique to cardiology. |
| CA3-GC04f | Monitor effectiveness of communication and take action to enhance understanding where required. |
| CA3-GC04g | Employ appropriate non-verbal communication. |
| CA3-GC04h | Recognize and respond appropriately to non-verbal communication of others. |
| CA3-GC05a | Use a keyboard accurately and efficiently. |
| CA3-GC05b | Access data from databases, network and internet. |
| CA3-GC07a | Practice within the bounds of personal limitations and expertise. |
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| CA3-GC07b | Seek advice or assistance where necessary. |
| CA3-GC07c | Apply a logical thought process to solve problems and make professional judgement. |
| CA4-GC01c | Apply knowledge of the structure and function of the normal heart and circulatory system. |
| CA4-GC03b | Apply knowledge of lead theory, signal averaging and vector loops. |

5.0 COURSE LEARNING OUTCOMES

Upon successful completion of the course learning outcomes, the student will reliably demonstrate the ability to:

LO01 Perform Electrocardiography.

LEARNING ELEMENTS

Prepare a patient for, and perform a 12-lead ECG.

Analyze the components and parameters of a normal 12-lead ECG.

Troubleshoot and correct common artifacts, and technical errors.

Apply Einthoven's law to troubleshoot the electrocardiogram.

Demonstrate care and maintenance of the electrocardiograph.

Troubleshoot electrocardiograph machine.

Modify test according to special patient needs.

Obtain signal averaged ECG recordings and trans-telephonic recordings.

Record special leads such as Lewis lead, posterior leads, right sided chest leads, and pediatric leads.

Record a 15 lead ECG.

Differentiate esophageal leads from, Frank X, Y and Z leads, and apical leads.

Perform deep inspiration rhythm strips to identify significant Q waves.

LINKING TO STANDARDS

| Vocational Standard | Essential Employability Skills | | External Standard | |
|---------------------|--------------------------------|-------------------------------|-------------------|-------------------------------|
| N/A | EES Code | Characterization (1,2,3,4) | ES Code | Characterization (1,2,3,4) |
| | EE01-A | 3 | CA1-C01a | 3 |
| | EE01-B | 3 | CA1-GC01b | 3 |
| | EE03-A | 3 | CA1-GC01c | 3 |
| | EE03-B | 3 | CA1-GC01d | 2 |
| | EE04-A | 1 | CA1-GC01e | 3 |
| | EE05-B | 3 | CA1-GC01f | 3 |
| | EE06-A | 4 | CA1-GC01g | 3 |
| | EE06-B | 3 | CA1-GC01h | 3 |
| | | | CA1-GC01i | 3 |
| | | | CA1-GC01j | 3 |
| | | | CA1-GC01k | 3 |

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|-----------|---|
| CA1-GC01l | 3 |
| CA1-GC01m | 2 |
| CA1-GC01n | 3 |
| CA1-GC06a | 3 |
| CA1-GC06e | 3 |
| CA2-GC01a | 3 |
| CA2-GC01b | 3 |
| CA2-GC01c | 3 |
| CA2-GC01d | 3 |
| CA2-GC01e | 3 |
| CA2-GC01f | 3 |
| CA2-GC01g | 3 |
| CA2-GC01h | 3 |
| CA2-GC01i | 3 |
| CA2-GC01j | 3 |
| CA2-GC01k | 3 |
| CA2-GC01l | 3 |
| CA2-GC02a | 3 |
| CA2-GC02b | 3 |
| CA2-GC02c | 2 |
| CA2-GC02d | 3 |
| CA2-GC03a | 3 |
| CA2-GC03h | 2 |
| CA2-GC03i | 2 |
| CA2-GC03j | 2 |
| CA2-GC03k | 2 |
| CA2-GC03l | 2 |
| CA2-GC03m | 2 |
| CA2-GC03n | 2 |
| CA2-GC04a | 2 |
| CA2-GC04b | 3 |
| CA2-GC05a | 3 |
| CA2-GC05b | 3 |
| CA2-GC05d | 3 |
| CA2-GC09a | 3 |
| CA2-GC09b | 3 |
| CA2-GC09d | 2 |
| CA2-GC10a | 3 |
| CA3-GC01b | 3 |
| CA3-GC03a | 3 |
| CA3-GC03b | 3 |
| CA3-GC03c | 3 |
| CA3-GC03d | 3 |
| CA3-GC04a | 3 |

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| | 3 |
| CA3-GC04c | 3 |
| CA3-GC04d | 3 |
| CA3-GC04e | 3 |
| CA3-GC04f | 3 |
| CA3-GC04g | 3 |
| CA3-GC04h | 3 |
| CA3-GC05a | 3 |
| CA3-GC05b | 3 |
| CA3-GC07a | 3 |
| CA3-GC07b | 3 |
| CA3-GC07c | 3 |
| CA4-GC01c | 2 |
| CA4-GC03b | 2 |

LO02 Perform Ambulatory ECG Monitoring.

LEARNING ELEMENTS

Prepare a patient for an ambulatory ECG.

Select electrode sites and apply monitor.

Demonstrate use, care and maintenance of Holter recorders.

LINKING TO STANDARDS

| Vocational Standard | Essential Employability Skills | | External Standard | |
|---------------------|--------------------------------|-------------------------------|-------------------|-------------------------------|
| N/A | EES Code | Characterization (1,2,3,4) | ES Code | Characterization (1,2,3,4) |
| | EE01-A | 3 | CA1-GC01b | 2 |
| | EE01-B | 1 | CA1-GC01e | 3 |
| | EE03-A | 3 | CA1-GC02a | 3 |
| | EE03-B | 2 | CA1-GC02b | 3 |
| | EE04-B | 1 | CA1-GC02c | 3 |
| | EE05-B | 3 | CA1-GC02d | 3 |
| | EE06-A | 3 | CA1-GC02e | 3 |
| | EE06-B | 2 | CA1-GC05a | 3 |
| | | | CA1-GC06b | 3 |
| | | | CA1-GC06c | 3 |
| | | | CA1-GC06e | 3 |
| | | | CA2-GC01a | 3 |
| | | | CA2-GC01b | 3 |
| | | | CA2-GC01c | 3 |
| | | | CA2-GC01d | 3 |
| | | | CA2-GC01e | 3 |

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| CA2-GC01f | 3 |
| CA2-GC01g | 3 |
| CA2-GC01h | 3 |
| CA2-GC01i | 3 |
| CA2-GC01j | 3 |
| CA2-GC01k | 3 |
| CA2-GC01l | 3 |
| CA2-GC02a | 3 |
| CA2-GC02b | 3 |
| CA2-GC02c | 3 |
| CA2-GC02d | 3 |
| CA2-GC02e | 2 |
| CA2-GC03a | 3 |
| CA2-GC03l | 2 |
| CA2-GC03m | 2 |
| CA2-GC03n | 2 |
| CA2-GC04b | 2 |
| CA2-GC05a | 3 |
| CA2-GC05d | 3 |
| CA2-GC08a | 3 |
| CA2-GC08b | 3 |
| CA2-GC08c | 3 |
| CA2-GC08d | 3 |
| CA2-GC08e | 3 |
| CA2-GC08f | 3 |
| CA2-GC08g | 3 |
| CA2-GC09a | 3 |
| CA2-GC10a | 3 |
| CA2-GC10b | 3 |
| CA3-GC03a | 3 |
| CA3-GC03b | 3 |
| CA3-GC03c | 3 |
| CA3-GC03d | 3 |
| CA3-GC04a | 3 |
| CA3-GC04b | 3 |
| CA3-GC04c | 3 |
| CA3-GC04d | 3 |
| CA3-GC04e | 3 |
| CA3-GC04f | 3 |
| CA3-GC04g | 3 |
| CA3-GC04h | 3 |
| CA3-GC05a | 3 |
| CA3-GC07a | 3 |
| CA3-GC07b | 3 |

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| | 3 |
| CA4-GC01c | 3 |
| CA4-GC03b | 3 |

LO03

Outline the ethical considerations and legal implications of acting in the role of a health care professional.

LEARNING ELEMENTS

Apply the basic concepts found in health care ethics during lab training sessions.

Outline the legal implications of acting in the role of a health care professional.

Propose methods that may be utilized to maintain one's confidentiality in the health care setting.

Examine the need for information disclosure

Illustrate ways to avoid mistakes and accusations of negligence.

LINKING TO STANDARDS

| Vocational Standard | Essential Employability Skills | | External Standard | |
|---------------------|--------------------------------|-------------------------------|-------------------|-------------------------------|
| N/A | EES Code | Characterization (1,2,3,4) | ES Code | Characterization (1,2,3,4) |
| | EE01-A | 2 | CA2-GC01a | 2 |
| | EE03-A | 2 | CA2-GC01b | 2 |
| | EE03-B | 2 | CA2-GC01c | 2 |
| | EE06-B | 3 | CA2-GC01d | 2 |
| | | | CA2-GC01e | 2 |
| | | | CA2-GC01f | 2 |
| | | | CA2-GC01g | 2 |
| | | | CA2-GC01h | 2 |
| | | | CA2-GC01i | 2 |
| | | | CA2-GC01j | 2 |
| | | | CA2-GC01k | 2 |
| | | | CA2-GC01l | 2 |
| | | | CA2-GC01m | 2 |
| | | | CA2-GC02a | 2 |
| | | | CA2-GC03a | 2 |
| | | | CA2-GC03m | 2 |
| | | | CA2-GC03n | 2 |
| | | | CA2-GC05d | 2 |
| | | | CA3-GC01a | 2 |
| | | | CA3-GC01b | 2 |
| | | | CA3-GC01c | 2 |
| | | | CA3-GC01d | 2 |
| | | | CA3-GC02a | 2 |
| | | | CA3-GC02b | 2 |

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| CA3-GC02c | 2 |
| CA3-GC03c | 2 |
| CA3-GC07a | 2 |
| CA3-GC07b | 2 |
| CA3-GC07c | 2 |

6.0 ASSESSMENT

Individual assignment and grading details to be provided by Instructor.

| Assessment Method | Weight | Associated Outcomes |
|-------------------|------------------|---------------------|
| Lab(s) | R | LO01 , LO02 |
| Practical | R | LO01 , LO03 |
| Test(s) | R | LO01 , LO02 , LO03 |
| TOTAL | Requirement s | |

7.0 STUDENT SUCCESS - POLICIES AND PROCEDURES

Mohawk College has developed several policies and procedures designed to protect students and provide an enriching and rewarding learning experience in which the rights of individuals are respected. This may include the use of digital assessments such as [turn it in](#). For the most up to date information on the following policies and procedures, consult Mohawk College's [Policies and Procedures](#) website.

In addition, students enrolled in Mohawk/McMaster collaborative programs are protected under McMaster University's policies and procedures outlined in [General Academic Regulations, McMaster Undergraduate Calendar](#), and in McMaster's [Academic Integrity Policy](#).

Please be advised that all policies and procedures are subject to change.

EFFECTIVE FALL 2009 - Policy: AC700 - Program Promotion and Graduation Requirements: A minimum grade of 50% is required as a course pass at Mohawk College. Please be aware, however, that a higher passing grade (minimum 60% or 70%) may be required if this course is taken as part of certain diploma or certificate programs. Please consult your Academic Department for details.

Additionally, if you are taking this course as part of a diploma or certificate program, be aware that you need an overall weighted grade point average (WGPA) of at least 60% to graduate. Graduation requirements are higher for some programs. Please check requirements with your department.

Note:

Faculty are required to review Emergency Lockdown procedures and Emergency Evacuation Procedures, including Evacuation Procedures for students with disabilities, at the first class of every course they are teaching each semester. This information is available in the College Emergency Safety and Security Procedures Booklet distributed to all staff in hard copy, or online in MoCoMotion within the HR Staff Services Tab in the Occupational Health and Safety Channel (Occupational Health and Safety web site).

Course information correct as of: **June 14, 2009**

Last updated by: **Rajinder Virk**