COURSE OUTLINE

SCHOOL:        School of Engineering Technology and Applied Science

DEPARTMENT:    Information and Communication Engineering Technology (ICET)

PROGRAM:       Biomedical Engineering Technician/Technology

COURSE TITLE:   Infection Control & Microbiology

COURSE CODE:    BTEC 212

TOTAL COURSE HOURS:       15 Weeks X 3 hours

PRE-REQUISITES/CO-REQUISITES:    N/A

COURSE ELIGIBILITY FOR PRIOR LEARNING ASSESSMENT AND RECOGNITION (PLAR):    Yes

ORIGINATED BY:   Allan Richardson, Charanjit Bambra, PhD (July 2008)

REVISED BY:

DATE:

APPROVED BY:  _________________________
              Chairperson/Dean

Academic Year:  2008 - 2009

Students should keep all course outlines for each course taken at Centennial College. These may be used to apply for transfer of credit to other educational institutions. A fee may be charged for additional or replacement copies.
COURSE DESCRIPTION:
The course will introduce students to basic principles of biosafety in the laboratory environment. The course will introduce basic concepts of biology and microbiology, laboratory biosafety and infection control. The course will focus on general safety measures, personal safety and occupational health and safety matters. The course will introduce microorganisms and specifically the structure and characteristics of bacteria, viruses, fungi and parasites that cause disease in humans. The course will also cover the field of infection control in health settings and provide insights into risk identification and prevention strategies. The course will also provide students with theory and practical application of use, care and maintenance of biosafety equipment.

COURSE LEARNING OUTCOMES:

Module 1
• Describe the structure and characteristics of different types of micro-organisms with respect to infection
• Explore the associations in communicable diseases between infection and disease
• Understand contemporary issues concerning transmission of disease
• Understand and apply institutional policies and procedures

Module 2
• Understand the purpose, function and components of preventing infection
• Understand the role of government agencies in infection control
• Become aware of basic principles of sterilization and disinfection
• Construct a critical analysis of an infection control issue based on recent literature
• List appropriate procedures to implement in healthcare settings during a public health emergency

Module 3
• Understand the strengths and weakness of various infection control strategies
• Assess healthcare workers or equipment technicians risk of occupational exposure to infectious agents
• Become aware of the different biocontainment levels and Canadian standards regulating construction of isolation rooms and biosafety cabinets
• Develop appropriate personal and interpersonal professional behaviors required to handle equipment in healthcare settings

ESSENTIAL EMPLOYABILITY SKILLS (EES):
This course supports the students’ ability to:

• Communicate clearly, concisely, and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
• Apply a systematic approach to solve problems.
• Analyze, evaluate, and apply relevant information from a variety of sources.
• Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
• Manage the use of time and other resources to complete projects.

PRIOR LEARNING ASSESSMENT & RECOGNITION PROCESS (ES):
This course is eligible for PLAR through the Registrar and SETAS offices. Assessment of portfolio and/or testing may be discussed with faculty.
EVALUATION & GRADING SYSTEM:
To pass the course the students must achieve an average of 50% from the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Test Module 1</td>
<td>25</td>
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<tr>
<td>Test Module 2</td>
<td>25</td>
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<tr>
<td>Test Module 3</td>
<td>25</td>
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<tr>
<td>Project</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
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</tbody>
</table>

STUDENT ACCOMMODATION:

All students have the right to study in an environment that is free from discrimination and/or harassment. It is College Policy to provide accommodation based on grounds defined in the *Ontario Human Rights Code*. Accommodation may include changes or modifications to standard practices.

Students with disabilities who require academic accommodations must register with the Centre for Student with Disabilities. Please see the Centre for Students with Disabilities for details.

Students requiring accommodation based on human rights grounds should talk with their professors as early as possible. Details are available on the Centennial College website ([www.centennialcollege.ca](http://www.centennialcollege.ca)).

If students are unable to write an examination due to a medical problem or unforeseen family problems, they should immediately contact their professor or program Chair for advice. In exceptional and well documented circumstances (e.g. unexpected family problems, serious illness, or death of a close family member), students should be able to write a make-up examination to replace an examination missed.

TEXT AND OTHER INSTRUCTIONAL/LEARNING MATERIALS:

Selected parts of Book Chapters from:

- *Foundations in Microbiology* by Kathleen Park Talaro, McGraw Hill Higher Education
  ISBN: 978-0-07-299489-6


Handouts and online sources

USE OF DICTIONARIES

Use of Dictionary in any form, printed or electronic is not permitted in test or examination setting.
POLICY STATEMENTS

College Policies

The following statements are selected from Centennial College policies approved by the Board of Governors.

Student Responsibilities

Students are expected to know the contents of the course outline and to discuss with the professor any areas where clarification is required.

Students should keep all course outlines for each course taken at Centennial College. These may be used to apply for transfer of credit to other educational institutions. A fee may be charged for additional or replacement copies.

Other Policies

Students should familiarize themselves with all College Policies that cover students’ rights, responsibilities, and the Academic Appeal process. For further information, consult the Academic Matters Section in the full-time and Continuing Education calendars. The Academic Appeal Application form is available from any Enrolment Services Office.

Proof of Student Status

Students must produce official photo identification at any time during the semester when requested to do so by any professor. (The official piece is the Centennial Student Card.) Continuing Education students do not have Centennial Student Cards, and so they may use other forms of photo identification, such as a driver’s license, health card, or other government-issued photo identification.

Final Examinations

When writing a test or examination, students must put their official photo-ID cards in full view for review by the invigilator. Students who do not have official photo-ID will be permitted to write the examination with a substitute photo-ID, but they will be required to produce photo-ID at the program or department office within 24 hours or the next business day following the examination, or else the examination results will be void.

More Final Examination Policies are available at http://my.centennialcollege.ca.

Academic Progression Policy for Diploma and Certificate Programs:

College Academic Standings will be applied. Please see Academic Policies and Procedures, Full-Time Calendar.

Faculty Consultation

Professors are available to see students outside of class time. Students can contact professors via voice mail, email, or through their program or department office. Information regarding how to contact teachers will be provided at the beginning of the course and is also available in the program or department office.

Human Rights Statement

It is the policy of the College that all programs will strive for a learning, teaching, and working environment that promotes inclusion, understanding, and respect for all students and employees, consistent with the Ontario Human Rights Code and Centennial College's Statement of Diversity.
## TOPICAL OUTLINE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC/CONTENT</th>
<th>READINGS</th>
<th>LEARNING OUTCOMES</th>
<th>INSTRUCTIONAL STRATEGIES USED</th>
<th>COURSE EVALUATIONS (TESTS &amp; ASSIGNMENTS USED)</th>
</tr>
</thead>
</table>
| 1    | Module 1: Biology and Microbiology - Microbes | Book Chapter | Introduction to microbes  
- Scientific Method  
- Microorganisms  
- Characteristics of life  
- Organization of living things  
- Classification of organisms | Instructor-led lecture, tutorial and group work | Tutorial 1 |
| 2    | Module 1: Biology and Microbiology – Biochemistry | Book Chapter | Understand the basic biochemical concepts  
- Building blocks  
- Macromolecules: Superstructures of life Cells  
- Where chemicals come to life | Instructor-led lecture, tutorial and group work | Tutorial 2 |
| 3    | Module 1: Biology and Microbiology – Microbial | Book Chapter | Understand different micro-organisms  
- Bacteria and Viruses  
- Protists  
- Fungi  
- Prions | Instructor-led lecture, tutorial and group work | Tutorial 3 |
| 4    | Module 1: Biology and Microbiology – Infectious Diseases | Book Chapter | Understand relationship between microorganisms and infection  
- Colonization, Infection, Disease  
- Development of Infection  
- Sources and Spread of Microbes  
- Epidemiology  
- Risks for nosocomial infections | Instructor-led lecture, tutorial and group work | Tutorial 4 |
| 5    | Module 1: Biology and Microbiology – Anatomical and Physiological Barriers | Book Chapter | Learn about natural anatomical and physical barriers with respect to prevention of disease  
- Defence Mechanisms in Perspective  
- Structure and Function of Organs of Defence  
- Second Line of Defence | Instructor-led lecture and group work | Module 1 Test |
| 6    | Module 2: Laboratory Biosafety - Physical and Chemical Agents for Microbial Control | Book Chapter | Appreciate that microbes can be inactivated through the use of physical and chemical procedures  
- Controlling Microorganisms  
- Methods of Physical Control  
- Chemical Agents in Microbial Control | Instructor-led lecture, tutorial and group work | Introduction to project |
| 7    | Module 2: Laboratory Biosafety – Role of Government Agencies | On Line Sources and Hand Outs | Introduction to Government agencies that are involved in infection control  
- Guidelines  
- Standards  
- Blood borne pathogens  
- Air borne pathogens | Instructor-led lecture, tutorial and group work | Tutorial 5 |
| 8    | Module 2: Laboratory Biosafety – Biological Safety | On Line Sources and Hand Outs | Understand the basics of infection control, medical surveillance and containment  
- Risk assessment | Instructor-led lecture, tutorial and group work | Project |
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| 9    | Module 2: Laboratory Biosafety – Biological Safety Cabinets | On Line Sources and Hand Outs | • Containment levels  
• Management of biological safety  
• Bioterrorism  
• Canadian guidelines and servicing protocols  
• Installation, service, maintenance and certification  
• Use of biosafety cabinets | Instructor-led lecture, tutorial and group work | Wet Lab Visit |
| 10   | Module 2: Laboratory Biosafety – Handling and Transport of Infectious Materials | On Line Sources and Hand Outs | • Appreciate that strict local and international guidelines exist for handling and shipping infectious materials including tissues, bioengineered organisms and body fluids  
• Canadian Standards  
• Handling and disposal of tissues and body fluids  
• Best Practice for handling infectious materials in the lab | Instructor-led lecture, tutorial and group work | Module 2 Test |
| 11   | Module 3: Infection Control – Isolation Rooms | On Line Sources and Hand Outs | • Understand the performance standards of an isolation room especially with regard to standards for different levels  
• Importance of negative pressure  
• Use of N95 mask to prevent inhalation of droplets, including fit test standards  
• Canadian guidelines for construction of isolation rooms  
• Disease outbreak decontamination | Instructor-led lecture, tutorial and group work | Tutorial 6 |
| 12   | Module 3: Infection Control – Microbiology of Skin | Book chapter, On Line Sources and Hand Outs | • Introduction to microbiology of skin with respect to disease prevention  
• Structural barriers  
• Biology of waterless hand scrubs  
• Soaps and Antiseptic Agents  
• Proper procedures for washing hands  
• Canadian Guidelines | Instructor-led lecture, tutorial and group work | Project |
| 13   | Module 3: Infection Control – Disinfection and sterilization of patient care equipment | On Line Sources and Hand Outs | • Introduction to a variety of techniques in the context of cleaning, disinfecting and sterilizing patient care equipment  
• Classification of Medical devices  
• Cleaning of equipment and Instruments  
• Chemical and physical disinfection  
• Canadian standards | Instructor-led lecture, tutorial and group work | Tutorial 7 |
| 14   | Module 3: Infection Control – Waste Management | Book chapter, On Line Sources and Hand Outs | • Understand the role of microorganisms in water, waste water and sewage treatment  
• Canadian Guidelines  
• Public Health Risk  
• Safety for Waste Handlers | Instructor-led lecture, tutorial and group work | Project Due |
| 15   | Study Week | | | | Module 3 Test |