Course Documentation Outline

School of Business, Biosciences and Justice Studies

SECTION I

1. Program (s): Biofood, Biotechnology, Chemical, Environmental

2. Course Name: Microbiology

3. Course Code: BIOS 2000

4. Credit Value: 3 Course Hours: 42

Class	Lab	Field	Other	Total
14	28			42

5. Prerequisites/Corequisites/Equivalent Courses

PR/CO/EQ	Course Code	Title
PR	BIOS 1000	Biology
PR	BIOS 1001	Introduction to Microbiology

6. **Faculty:** Eric Bauer **Date:** May 2010 **Effective Date:** Sept. 2010

7. **Dean/Chair's Approval:** Jim Whiteway **Date: May 2010**

9. **Revision Number:** **Date:** **Effective Date:**

10: **Notes: A passing grade is 60%.**

Section II

11. **Calendar Description:**

This applied biology course provides an introduction to practical techniques of microbiology. Specific topics address microscopy, staining methods, cultivation and enumeration of microorganisms, control of microbial growth, sanitary analyses and industrial applications of microbiology.

12. **Provincial Context:**
This course meets the following Ministry of Education and Training requirements:

a). **Prior Learning Assessment (PLA)**
Students may apply to receive credit by demonstrating achievement of the course learning outcomes through previous life and work experiences.

This course is eligible for challenge through the following method(s) indicated by *

Challenge Exam	Portfolio	Interview	Other	Not Eligible
*	*	*		

PLAR Contact:

13. **Employability Skills emphasized in this course**

	communication - written		communication - visual		communication - oral
*	analytical		creative thinking		decision making
*	interpersonal	*	numeracy	*	organizational
*	problem solving	*	technological		other (specify)

14. **Required Texts, Materials, Resources or Technical Materials Required:**

Tortora, G.J., Funke, B.R., and C.L. Case. 2010. Microbiology: An Introduction, 10th Edition. Benjamin Cummings.

15. **Evaluation Plan**
Students will demonstrate learning in the following ways:

Assignment Description	Evaluation Methodology	Due Date
Lab Book records	5% per entry for 10 laboratories	weekly
Post-laboratory questions	2% per entry for 10 laboratories	weekly
Technical competency	3% per skills assessment (10 in total)	weekly

16. **Other**

Policy for missed tests/work and submission of assignments:
Students are expected to make every reasonable effort not to miss tests and to submit all assigned work on time! Students must advise the instructor **in advance** if they are unable to meet scheduled deadlines, **otherwise late assignments will not be accepted for evaluation and a grade of zero will be assigned**. Every effort will be made to accommodate students unable to meet specified deadlines as a result of extenuating circumstances; however, the instructor reserves the right to refuse late assignments and to refuse to reschedule assessments.

Loyalist College has a Violence Prevention policy:

- All College members have a responsibility to foster a climate of respect and safety, free from violent behaviour and harassment.
- Violence (e.g. physical violence, threatening actions or harassment) is not, in any way, acceptable behaviour.
- Weapons or replicas of weapons are not permitted on Loyalist College property.
- Unacceptable behaviour will result in disciplinary action or appropriate sanctions.
- More information can be found in the "Student Manual and Guide - Rights & Responsibilities".

Section III

17. **Curriculum Delivery, Learning Plan and Learning Outcomes:**

Course Components/Content	**Related Learning Outcomes**	**Learning Activities/Resources**
1. Explain fundamental theory of microbiology.	a. Classify micro life and describe the diversity within the Moneran, Fungi and Protista kingdoms. b. Relate specific microbiological techniques to microbial kingdoms.	Curriculum objectives will be achieved through a combination of the following teaching strategies:

2. Demonstrate competence with specialized laboratory equipment and application of microbiological procedures.	a. Apply techniques for microscopic study of bacteria, fungi and protozoa. b. Discuss magnification, resolution and size estimation of microscopic specimens. c. Explain objectives of staining microorganisms and conduct simple, differential and specialised staining procedures. d. Apply aseptic technique, including disinfection and sterilization, in the handling of specimens, equipment, and media. e. Describe criteria and methods to obtain pure cultures of microorganisms. f. Relate environmental factors like heat, light, air composition, humidity, etc. to the successful culture of desired microorganisms.	1. Lecture 2. Laboratory activities (guided and discovery) 3. Simulation (computer) and field activity 4. Cooperative study 5. Independent study (i.e. required readings and exercises)
3. Explain characteristics of living organisms.	a. Sketch structure and explain structural functions of prokaryotic and eukaryotic cells. b. Relate properties of biological molecules, enzyme catalysis, energy liberation and storage, to culturing requirements. c. Use bacterial metabolic pathways, nutritive requirements, and growth processes as a basis for culturing. d. Apply and interpret results of specific biochemical tests (e.g. hydrolysis of extracellular molecules, fermentation and respiration of carbohydrates, utilization of amino acids, etc.) to identify bacteria.	
4. Describe and apply physical and chemical methods for the control of microorganisms.	a. Apply aseptic technique, including disinfection and sterilization, in the handling of specimens, equipment, and media.	

5. Use enumerative techniques to quantify microorganisms.	a. Determine the number of microbes in an environmental, food and/or pharmaceutical sample (i.e. selection of appropriate procedure, sampling method, sample preservation, etc.). b. Conduct direct microscopic counts with a hemocytometer, use direct enumeration of viable colony forming units and use indirect enumeration of population size.	
6. Conduct standard analyses to assess the microbial character of water, sewage and other specific media.	a. Describe the microbial flora of water. b. Conduct a standard plate count for the enumeration of bacteria in water and milk, and perform tests for water potability (i.e. presumptive, confirmed and completed tests).	