Course Specifications

General Information

Course name	Microbiology
Course number	NURS3322
Faculty	
Department	
Course type	Major Needs
Course level	3
Credit hours (theoretical)	2
Credit hours (practical)	1
Course Prerequisites	

Course Objectives

1 - Compare and contrast the characteristics of pathogens including bacteria, protozoans, viruses, prions and parasitic worms.
2 - To demonstrate the ubiquity and diversity of microorganisms in the human body and the environment
3 - Evaluate and determine the appropriate treatment and disinfectant based on the characteristics of the microbe.
4 - Describe microbial metabolism and evolution and evaluate the effect on human disease.
5 - To show how the human immune system counteracts infection by specific and non- specific mechanisms.

Intended Learning Outcomes

Knowledge and Understanding	* A1. To illustrate the characteristics features of microorganisms and the diseases they cause. * A2. To explore mechanisms by which microorganisms cause disease. * A3. To show the reasons for, and the methods for sterilization of equipment and medical preparations from the microbiological point of view.
Intellectual Skills	* B1. To explore the routes of transmission of infection in hospitals, communities and populations and the methods used to control the spread of infection. * B2. To demonstrate the principles of vaccine preparation and the use of vaccines in immunization.
Professional Skills	* C1. To show the antimicrobial activity of disinfectants in the context of the patient and the environment * C2. To demonstrate the contribution of the microbiologist and the microbiology laboratory to the diagnosis of infection including specimen collection and the role of the nurse in carrying this out.
General Skill	* D1. To illustrate the microbiological reasons for, and the importance of aseptic techniques in patient management.

Course Contents

1 - History and general applications of microbiology.
2 - Chemistry including atomic structure and bonding, enzymes, major macromolecules and inorganic compounds relevant to microbial life.
3 - Classification of microorganisms: Taxonomy, Phylogeny and Nomenclature.
4 - Observing microorganisms utilizing microscopy and staining methods.
5 - Comparison of prokaryotic and eukaryotic cells
6 - Factors affecting microbial growth, culturing microorganisms, aseptic techniques, antibiotics and bactericidal to control microbial growth.
7 - Microbial metabolism and enzymatic activities.
8 - Microbial genetics and biotechnology as related to medicine and human health. I. Bacterial pathogens.
9 - A cellular pathogens including viruses and prions.
10 - Eukaryotic pathogens including fungi, protozoa and helminthes.
11 - Epidemiology and pathology related to microbial diseases, immunology of host organism, vaccinations
12 - Laboratory Work Schedule
13 - Week 1
14 - a) Safety precautions in the laboratory.
15 - b) Care and use of the light microscope.
16 - c) Principle and use of the autoclave.
17 - Week 2
18 - a) Transfer of microbial cultures (sub-culturing)
19 - week 3
20 - a) Isolation of pure cultures (streak plate; spread plate; pour plate)
21 - week 4
22 - a) Isolation of discrete colonies from mixed cultures
23 - week 5
24 - a) Cultural characteristics of microorganisms
25 - week 6
26 - a) Microscopy
27 - week 7
28 - a) Hanging drop preparation
29 - week 8
30 - a) Principles of staining bacteria
31 - week 9
32 - a) Preparation of bacterial smears
33 - week 10
34 - a) Simple staining techniques
35 - week 11
36 - a) Negative staining techniques
37 - week 12
38 - a) Gram staining
39 - week 13
40 - a) Acid fast staining

Teaching and Learning Methods

1 - Lecture/discussion.
2 - Small-group work.
3 - Laboratory
4 - Student oral presentations.

Students Assessment

Assessment Method	TIME	MARKS
First midterm exam	4th week	20%
Second midterm exam	8th week	10%
Attendance &Participations		5%
Performance of laboratory techniques		5%
Final clinical exam	16th week	10%
Final written exam	16th week	50%

Books and References

Essential books	Cowan, M. K. (2014). Microbiology: a systems approach (4th. Ed.) New York, NY: McGraw-Hill Higher Education.
Recommended books	Nester, 2015. Microbiology: A Human Perspective, 8th Edition. McGraw-Hill Publications. ISBN- 9780073522593.