

DEREE COLLEGE SYLLABUS FOR: BMS 3220 MICROBIOLOGY AND INFECTIOUS DISEASE	
(Fall 2019)	UK LEVEL: 5 UK CREDITS: 15 US CREDITS: 3/0/3
PREREQUISITES:	BI 1000 Introduction to Biology I BI 1101 Introduction to Biology II
CATALOG DESCRIPTION:	An analysis of essential microbiology and infectious disease. The course introduces the major classes of micro-organisms and through their biological adaptations relates them to human activity. Their beneficial and harmful roles on humans is discussed through case studies, disease profiles and epidemiological analysis.
RATIONALE:	This course is a thorough analysis on the structure and function of microorganisms through the scope of microbiology and infectious disease. Students will be exposed to the classes of pathogenic and beneficial microbes as well as to the obligatory parasitism of viruses. Theories of infectious disease, vector transmission evolutionary and radiative adaptation will be discussed. Host-parasite interactions, immunity and epidemiology will be addressed and through case studies, and practical engagement students will gain understanding of the applications of microbiology.
LEARNING OUTCOMES:	As a result of taking this course, the student should be able to: <ol style="list-style-type: none"> 1) Demonstrate an understanding of the biology classes of micro-organisms and infectious agents (bacteria, viruses, fungi, protozoan and non-cellular agents). 2) Apply methods of scientific enquiry by demonstrating problem solving and critical thinking skills towards diagnostic or epidemiological evaluation of case studies. 3) Compare the beneficial and harmful roles and applications of microbiology as well as the interplay between the social, environmental and economic considerations of infectious disease. 4) Develop the necessary critical and analytical skills to understand the nature of disease, its impact and the means to combat it.
METHOD OFTEACHING AND LEARNING:	In congruence with the teaching and learning strategy of the college, the following tools are used: <ul style="list-style-type: none"> > Class lectures, interactive learning (class discussions, group work) video presentations, and practical problems solved in class. > Exercises and primary source documents are assigned as homework, the solutions of which are reviewed in class > Laboratory work. > Office hours: students are encouraged to make full use of the office hours of their instructor, where they can ask questions, see their exam paper, and/or go over lecture/lab material. > Use of a blackboard site, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources.
ASSESSMENT:	Summative:

	<table border="1"> <tr> <td data-bbox="667 134 1292 310"> First Assessment Case Study- Written project (2,000-2,300 words) (Students will be given in random an actual case study and will be required to identify the pathogen/disease/syndrome and file a 2000 word report on it) </td> <td data-bbox="1292 134 1455 310">40</td> </tr> <tr> <td data-bbox="667 310 1292 401"> Second Assessment Final examination (2-hour, comprehensive), Short and Long Essay questions </td> <td data-bbox="1292 310 1455 401">50</td> </tr> <tr> <td data-bbox="667 401 1292 604"> Third assessment Portfolio Essays, exercises, problems, aiming to prepare students for their first and second assessments in terms of content, context and time management </td> <td data-bbox="1292 401 1455 604">10</td> </tr> </table>	First Assessment Case Study- Written project (2,000-2,300 words) (Students will be given in random an actual case study and will be required to identify the pathogen/disease/syndrome and file a 2000 word report on it)	40	Second Assessment Final examination (2-hour, comprehensive), Short and Long Essay questions	50	Third assessment Portfolio Essays, exercises, problems, aiming to prepare students for their first and second assessments in terms of content, context and time management	10
First Assessment Case Study- Written project (2,000-2,300 words) (Students will be given in random an actual case study and will be required to identify the pathogen/disease/syndrome and file a 2000 word report on it)	40						
Second Assessment Final examination (2-hour, comprehensive), Short and Long Essay questions	50						
Third assessment Portfolio Essays, exercises, problems, aiming to prepare students for their first and second assessments in terms of content, context and time management	10						
INDICATIVE READING:	REQUIRED READING: Microbiology: A Systems Approach 5th Edition Marjorie Kelly Cowan ISBN10: 1259937216 McGraw, Hill Copyright: 2018 RECOMMENDED READING: N/A						
INDICATIVE MATERIAL: <i>(e.g. audiovisual, digital material, etc.)</i>	REQUIRED MATERIAL: N/A RECOMMENDED MATERIAL:N/A						
COMMUNICATION REQUIREMENTS:	N/A						
SOFTWARE REQUIREMENTS:	Microsoft Word, Microsoft PowerPoint, Blackboard CMS						
WWW RESOURCES:							

INDICATIVE CONTENT:**Cell Theory**

- History and development
- Impact on biology

Classification and Structure of Prokaryotic Cells

- Prokaryotic domains
- Major classifications of bacteria by shape
- Lack of nuclear membrane and mitotic apparatus
- Lack of typical eukaryotic organelles
- Presence of cell wall in bacteria
- Flagellar propulsion, mechanism

Growth and Physiology of Prokaryotic Cells

- Reproduction by fission
- High degree of genetic adaptability, acquisition of antibiotic resistance
- Exponential growth
- Existence of anaerobic and aerobic variants
- Parasitic and symbiotic
- Chemotaxis

Genetics of Prokaryotic Cells

- Existence of plasmids, extragenomic DNA
- Transformation: incorporation into bacterial genome of DNA fragments from external medium
- Conjugation
- Transposons (also present in eukaryotic cells)

Virus Structure

- General structural characteristics (nucleic acid and protein, enveloped and nonenveloped)
- Lack organelles and nucleus
- Genomic content — RNA or DNA

Viral Life Cycle

- Self-replicating biological units that must reproduce within specific host cell
- Generalized phage and animal virus life cycles
- Transduction: transfer of genetic material by viruses
- Retrovirus life cycle: integration into host DNA, reverse transcriptase, HIV

Epidemiology

- Spread of disease
- Modelling of infections

The Art and Science of Disease Prevention

- Vaccination
- Public health
- Sanitation

Themes in Evolution

- The Red Queen Hypothesis