<table>
<tr><td colspan="2">DEREE COLLEGE SYLLABUS FOR: BMS 4760 MOLECULAR AND MICROBIOLOGICAL TECHNIQUES 0/3/2</td></tr>
<tr><td colspan="2">(Fall 2024)</td></tr>
<tr><td>PREREQUISITES:</td><td>MA 2021 Applied Statistics for Sciences
BI 1000 Introduction to Biology I
BI 1101 Introduction to Biology II
BI 2222 Cell Biology or BI 3235 Cell and molecular biology
BI 3336 Molecular Biology or BI 3235 Cell and molecular biology
BMS 3220 Microbiology and infectious diseases (co- or prerequisite)
BMS 4645 Research methods and ICT tools in biomedical sciences (co- or prerequisite)</td></tr>
<tr><td>CATALOG DESCRIPTION:</td><td>An elective practical course designed to teach practical skills in molecular and cell biology, as well as microbiological techniques.</td></tr>
<tr><td>RATIONALE:</td><td>The molecular and microbiological techniques module is an elective lab-based course destined to students that want to pursue a career in research, industry or a diagnostics laboratory. The course will expose students to the scientific method and will provide skills in fundamental molecular, biochemical, immunological, microbiological and cell-based assays.</td></tr>
<tr><td>LEARNING OUTCOMES:</td><td>As a result of taking this course, the student should be able to:

1. Demonstrate understanding of essential cellular and molecular methodologies.
2. Execute experiments in cell biology, microbiology and biochemistry.
3. Organise and analyse data produced by the executed experimental methods.
4. Develop writing skills by organising data and composing a scientific report.</td></tr>
<tr><td>METHOD OF TEACHING AND LEARNING:</td><td>In congruence with the teaching and learning strategy of the college, the following tools are used:
o Laboratory work (practical engagement, reporting calculations and data processing).
o Instruction and demonstration of techniques through online, virtual and physical resources.</td></tr>
<tr><td>ASSESSMENT:</td><td>Summative:
<table><tr><td>1st assessment: a) Lab report and/or portfolio (25%) b) Lab quiz (25%) examining the first 6 experiments.</td><td>50%</td></tr><tr><td>Final assessment: a) Lab report and/or portfolio (25%) b) Lab quiz (25%) examining the last 6 experiments.</td><td>50%</td></tr></table>
Formative:
<table><tr><td>Homework questions and problems</td><td>0</td></tr></table>The 1st assessment tests Learning Outcomes 1-4
The final assessment tests Learning Outcomes 1-4</td></tr>
<tr><td>INDICATIVE READING:</td><td>REQUIRED READING:
N/A</td></tr>
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	RECOMMENDED READING: 1. Rob Reed, David Holmes, Jonathan Weyers, &Allan Jones, Practical Skills in Biomolecular Science, latest edition, Pearson
INDICATIVE MATERIAL: *(e.g. audiovisual, digital material, etc.)*	**REQUIRED MATERIAL:** o Laboratory Notebook (22.5x 28.6 cm) 100page, Scientific Format. o Laboratory Coat **RECOMMENDED MATERIAL:** o Scientific calculator o Ruler
COMMUNICATION REQUIREMENTS:	Verbal and written skills using academic / professional English
SOFTWARE REQUIREMENTS:	MS Office, Blackboard CMS
WWW RESOURCES:	• https://cshprotocols.cshlp.org/ • https://www.nature.com/nmeth/ • https://currentprotocols.onlinelibrary.wiley.com/journal/26911299
INDICATIVE LABORATORIES:	Cell and molecular biology o Immunofluorescence and microscopy o Cytogenetic analysis of metaphase chromosomes o Cytotoxicity testing o Mitotic index analysis Biochemistry o Protein extraction o Determination of protein concentration o SDS-PAGE o Protein analysis o Affinity chromatography Immunology o ELISA Microbiology o Inoculation and bacterial growth o Gram staining of bacteria o Enterobacterium testing - Catalase test o Antibacterial action of antibiotics o Microbial identification