

**DEREE COLLEGE SYLLABUS FOR:  
BMS 4545 RESEARCH METHODS AND ICT TOOLS IN BIOMEDICAL SCIENCES**

(Fall 2019 )

**UK LEVEL: 6  
UK CREDITS: 15  
US CREDITS: 3/0/3**

**PREREQUISITES:**

BI 1000 Introduction to Biology I  
BI 1101 Introduction to Biology II  
BI 3235 Cell and Molecular Biology  
BI 3240 Human Anatomy and Physiology  
MA 2025 Applied Statistics for Sciences

**CATALOG DESCRIPTION:**

The course provides a guide to the key practical and broader skills needed in biomedical sciences, including comprehensive coverage of: study and examination skills; fundamental laboratory and analytical skills; investigative techniques and evaluation skills; analysis and presentation of data. The capstone proposal is also prepared in this course.

**RATIONALE:**

This course aims to cover basic methods and techniques and provides students with the key points highlighting theoretical background to methods, to enhance understanding and the most important features of methodology.  
The course provides effective explanation and support for the development of a wide range of laboratory and data analysis skills that students will use repeatedly during the practical aspects of their studies. The knowledge and practical skills presented in this course will help students progress to other more advanced or specialized courses and will prepare them for their capstone course. The course also discusses data analysis and presentation, as well as how research results are communicated, thus introducing students to the basics of scientific research.

**LEARNING OUTCOMES:**

- As a result of taking this course, the student should be able to:
1. Discuss and utilize selected scientific methods and techniques related to biomedical sciences
  2. Identify moral and ethical issues of scientific research and apply professional codes of conduct to their biomedical research.
  3. Demonstrate ability to collect, record, process, interpret and present data using appropriate methods and techniques.
  4. Examine and analyse a biomedical research topic based on natural science methodology.
  5. Design and plan their capstone project by preparing their capstone proposal, with minimum guidance and within agreed guidelines.

**METHOD OF TEACHING AND LEARNING:**

- In congruence with the learning and teaching strategy of the college, the following tools are used:
- Class lectures, lab and practical work, interactive learning (class discussions, group work) audio-visual presentations, model, databases, and other and practical problems solved in class.
  - Exercises and primary source documents are assigned as homework, the solutions of which are reviewed in class
  - 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.

<b>ASSESSMENT:</b>	<p><b>Summative:</b></p> <table border="1" data-bbox="516 170 1466 569"> <tr> <td data-bbox="516 170 1263 457"> <p><b>First Assessment</b>            a) Review of a scientific article or report (20%)            b) Written report and oral presentation (50%)</p> <p>It includes the following components:            a) Review of a scientific article or report (20%)            b) Student project on a specific topic leading to a written report and oral presentation (50%)</p> </td> <td data-bbox="1271 170 1466 457" style="text-align: center; vertical-align: middle;">70</td> </tr> <tr> <td data-bbox="516 464 1263 569"> <p><b>Second Assessment</b>            Student's capstone proposal (2,000 - 3,000 words)</p> </td> <td data-bbox="1271 464 1466 569" style="text-align: center; vertical-align: middle;">30</td> </tr> </table> <p><b>Formative:</b></p> <table border="1" data-bbox="516 657 1466 730"> <tr> <td data-bbox="516 657 1263 695">Selected practical exercises and short practice projects</td> <td data-bbox="1271 657 1466 695" style="text-align: center;">0</td> </tr> <tr> <td data-bbox="516 701 1263 730">essay questions</td> <td data-bbox="1271 701 1466 730" style="text-align: center;">0</td> </tr> </table> <p>The review of a scientific article and the student project test Learning Outcomes 1-4. The capstone proposal fulfils Learning Outcome 5.</p> <p>The formative practical exercises, short practice projects, and written essays aim to prepare students for their coursework portfolio.</p>	<p><b>First Assessment</b>            a) Review of a scientific article or report (20%)            b) Written report and oral presentation (50%)</p> <p>It includes the following components:            a) Review of a scientific article or report (20%)            b) Student project on a specific topic leading to a written report and oral presentation (50%)</p>	70	<p><b>Second Assessment</b>            Student's capstone proposal (2,000 - 3,000 words)</p>	30	Selected practical exercises and short practice projects	0	essay questions	0
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essay questions	0								
<b>INDICATIVE READING:</b>	<p><b>REQUIRED READING:</b></p> <p><b>Required Textbook:</b>            Rob Reed, David Holmes, Jonathan Weyers, &amp; Allan Jones, <b>Practical Skills in Biomolecular Science, 5th Edition</b>, ISBN 9781292100739, Edition 5<sup>th</sup>, Published date 11/08/2016, Published by Pearson United Kingdom (or latest edition)  <a href="https://pearson.com.au/products/Reed-Weyers-Jones/Reed-Rob-et-al/Practical-Skills-in-Biomolecular-Science/9781292100739?R=9781292100739">https://pearson.com.au/products/Reed-Weyers-Jones/Reed-Rob-et-al/Practical-Skills-in-Biomolecular-Science/9781292100739?R=9781292100739</a></p> <p><b>RECOMMENDED READING:</b></p>								
<b>INDICATIVE MATERIAL:</b> (e.g. audiovisual, digital material, etc.)	<p><b>REQUIRED MATERIAL:</b> N/A</p> <p><b>RECOMMENDED MATERIAL:</b> N/A</p>								
<b>COMMUNICATION REQUIREMENTS:</b>	In all presentations using proper English, written or spoken.								
<b>SOFTWARE REQUIREMENTS:</b>	Microsoft Word, Microsoft PowerPoint, Blackboard CMS								
<b>WWW RESOURCES:</b>	<p><a href="https://www.ncbi.nlm.nih.gov/pubmed/">https://www.ncbi.nlm.nih.gov/pubmed/</a></p> <p><a href="https://www.informaticseducation.org/">https://www.informaticseducation.org/</a></p> <p>The International Medical Informatics Association (IMIA)  <a href="http://imia-medinfo.org/wp/welcome-to-imia-2/">http://imia-medinfo.org/wp/welcome-to-imia-2/</a></p> <p>The Global Alliance for Genomics and Health (GA4GH)  <a href="http://genomicsandhealth.org">http://genomicsandhealth.org</a></p>								

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**INDICATIVE  
CONTENT (LEC):**

- Study and examination skills
- Information technology and learning resources
- Communicating information
- Fundamental laboratory techniques
- The investigative approach
- Working with cells and tissues
- Analytical techniques
- Assaying biomolecules and studying metabolism
- Genetics
- Analysis and presentation of data
- Development of the capstone proposal