DE LA SALLE UNIVERSITY   
**College of Science**

Department of Biology

**LBYMATB -**New Materials in Biology "Inside the World of Biotechnology (Laboratory)

*Prerequisite : NONE Prerequisite to :*

**INSTRUCTOR** : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**Contact details :** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Consultation Hours :** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Class Schedule & Room : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Course Description** |

LBYMATB (New Materials in Biology) is a laboratory course designed to help students appreciate and understand this exciting field by guiding them through the scientific underpinnings of modern biotechnology, giving them a grasp of the basic concepts and principles, and enabling them to be at pace with this rapidly evolving technology. This is brought about by the recent progress and cutting-edge breakthroughs in the field of biotechnology which have revolutionized our understanding of life processes and have led to innovations, practical applications and improvement in the ways by which we utilize living organisms to meet human needs.

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| **Learning Outcomes** |

On completion of this course, the student is expected to present the following learning outcomes in line with the Expected Lasallian Graduate Attributes (ELGA)

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| **ELGA** | **Learning Outcomes** |
| Critical and Creative Thinker  Effective Communicator  Lifelong Learner  Service-Driven Citizen | On completion of the course, the student is expected to be able to propose and present various uses and applications of biotechnology in daily life and in response to existing needs and problems affecting the society. |

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| **Final Course Output** |

As evidence of attaining the above learning outcomes, the student is required to submit the following during the indicated dates of the term.

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| **Learning Outcome** | **Required Output** | **Due Date** |
| Propose and present various uses and applications of biotechnology in daily life and in response to existing needs and problems affecting the society. | Topic proposal presentation of a biotechnology product to address society’s needs and problems | Week 5 |
| Exhibit on Biotechnology (creatively and ingeniously presented by the class divided into respective groupings) | Week 10-12 |

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| **Rubric for assessment** |

The following are the Rubrics that will serve as the basis for assessing the performance of the students on their preparations and presentation of the required final output for the course.

A. **Proposal Presentation of a Biotechnology Product**

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| **CRITERIA** | **Experts!**  **(3.5-4.0)** | **Team Players**  **(2.5-3.4)** | **Laid Back**  **(1.5-2.4)** | **Spacemen**  **(1.0-1.4)** |
| **Set Objectives**  **(30%)** | Objectives were set from the start of the presentation, and were reviewed at the conclusion of the presentation to remind the audience of the value of gained information.  Moreover, the group interacted with the audience to gauge the degree of appreciation to the value and application of biotechnology. | Objectives were set from the start of the presentation, and were reviewed at the conclusion of the presentation to remind the audience of the value of gained information. | Objectives were set from the start of the presentation, but were not reviewed at the conclusion of the presentation to remind the audience of the value of gained information. | No objectives were set for the group’s presentation. |

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| **Content of Presentation**  **(30%)** | The prescribed format of the presentation was followed, and the concepts were simplified with examples and most recent developments or information. | The prescribed format of the presentation was followed, and the concepts were simplified. | The prescribed format of the presentation was partly followed, and the concepts were partly technical. | The prescribed format was not followed, and the concepts were very technical. |
| **Overall Performance of the Group**  **(20%)** | The group’s preparedness was reflected in their familiarity with their presentation, by not reading from the slides, and by the way they engaged the audience during the presentation.  Moreover, they were properly dressed and poised during the presentation. | The group’s preparedness was reflected in their familiarity with their presentation, by not reading from the slides, and by the way they engaged the audience during the presentation. | The group showed partial preparedness because they were partially familiar with their presentation, read from the slides occasionally, and were not confident when engaging the audience during the presentation. | The group was not familiar with their presentation, they constantly read from the slides, and did not engage their audience during the presentation. |
| **Multimedia**  **(20%)** | The presentation involved the **creative** and **impressive** use of computer-assisted visual aids, with less text to read.  Moreover, other form of visual aid was used to break the monotony of software application. | The presentation involved the use of computer-assisted visual aids, with less text to read. | The presentation involved the use of computer-assisted visual aids, with more text to read than images to understand highlighted points. | The presentation involved the use of computer-assisted visual aids, with too many texts to read, and only a few images to ponder at points highlighted. |

1. **Exhibit of Biotechnology Products**

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| **CRITERIA** | **Experts!**  **(3.5-4.0)** | **Team Players**  **(2.5-3.4)** | **Laid Back**  **(1.5-2.4)** | **Spacemen**  **(1.0-1.4)** |
| **Display Booth**  **(40%)** | The group creatively followed the prescribed format of the exhibit which is original, giving a very professional and informative impression to viewers. The members were all present and enthusiastically accommodated queries of the visitors/guests. | The group followed the prescribed format of the exhibit which is less original and partially based on previous biotech studies/ products,  giving a professional and informative impression to viewers. The booth constantly had a member of the group to entertain queries from visitors  /guests. | The group partially followed the prescribed format of the exhibit which is heavily borrowed from previous ideas, giving a casual yet informative impression to viewers. There are instances the booth had no one to entertain queries from visitors/guests. | The group did not follow the prescribed format of the exhibit which is a copy of previous ideas, giving a much disorganized and less interesting impression to viewers. Though the booth had someone to tend to they were not very accommodating to the queries of the visitors/guests. |

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| **Design and Quality of Prototype**  **(30%)** | The prototype well represented the proposed Biotech product, creatively using recycled materials.  Moreover, the group’s resourcefulness  was reflected in the overall theme of the display booth and the attire of the group. | The prototype well represented the proposed GMO, creatively using recycled materials. | The prototype more or less represented the proposed GMO, partially using recycled materials. | The prototype was far from the looks of the proposed GMO, and was made of materials like it was not planned out. |
| **Exhibit Poster**  **(30%)** | The content is relevant, comprehensive and accurate, mostly following scientific logic. The poster had more graphic images than text, reflecting the thoroughness of the research conducted by the group, and was creatively designed and organized.  Moreover, other form of visual aid was used to ***spice*** up the poster. | The content is partially relevant and accurate and partially scientific.  The poster had more graphic images than text, reflecting the thoroughness of the research conducted by the group, and were all properly designed and organized. | The content is weak on scientific concept .The poster had less graphic images than text, partially reflecting the thoroughness of the research conducted by the group, and showed a hint of design and organization. | The content has very weak scientific concept.  The poster had more text than images, revealing the lack of deliberation and synthesis of researched information. The poster was badly designed and organized. |

**C. Reflection Papers**

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| **CRITERIA** | **Experts !**  **(3.5-4.0)** | **Team Players**  **(2.5-3.4)** | **Laid Back**  **(1.5-2.4)** | **Spacemen**  **(1.0-1.4)** |
| **Organization**  **(40%)** | Information is very organized with well- constructed paragraphs, use of subheadings, and information is factual and correct | Information is organized with well- constructed paragraphs and information is factual and correct | Information is organized but paragraphs are not well constructed and information is factual information | information appears not only disorganized but inaccurate information has nothing to do with the main topic |
| **Quality of Information**  **(40%)** | Information clearly relates to the main topic. It includes several supporting details and/or examples | Information clearly relates to the main topic. It provides 1 – 2 supporting details and/or examples | Information has little to do with the main topic. No details and/or examples are given | Information has nothing to do with the main topic |
| **Mechanics**  **(20%)** | No grammatical, spelling or punctuation errors | Almost no grammatical, spelling, or punctuation errors | A few grammatical, spelling, or punctuation errors | Many grammatical, spelling, or punctuation errors |

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| **Additional Requirements** |

* Active participation in class discussions
* Performance in laboratory discussions
* Attendance and participation in scheduled Biotech exhibit
* Timely submission of activity worksheet, reflection papers and projects which are non-plagiarized
* Passing midterm and final exams

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| **Grading Systems** |

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| Laboratory activities /Exercises 30%  BIOTECH Proposal (oral) 20%  (written) 10%  Prototype 10%  Full\* 40%  (if WINNER in exhibit)  Midtem Exam 15%  Attendance/Class participation 15%  **TOTAL 100%**  PASSING GRADE 60% | **Scale:**  92-100% 4.0  86-91% 3.5  80-85% 3.0  75-79% 2.5  70-74% 2.0  65-69% 1.5  60-64% 1.0  <60% 0.0 |

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| **Learning Plan** |

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| **Learning Outcome** | **Lecture Topic** | **Week** | **Learning Activities** |
| Propose and present various uses and applications of biotechnology in daily life and in response to existing needs and problems affecting the society.**COME** | Survey of Products of Biotechnology | 1-2 | Group dynamics |
| Fermentation – Yoghurt Making | 3 | Group dynamics |
| Fermentation – Ginger Ale Making | 4 | Group dynamics |
| DNA Extraction  Topic Proposal for Biotech Exhibit | 5 | Group dynamics |
| Agarose Gel Electrophoresis (AGE) | 6 | Group dynamics |
| Midterm Assessment | 7 |  |
| Agar Plate Streaking/Aseptic Techniques  Making Glow in the Dark Bacteria | 8 | Group dynamics |
| Karyotyping  Biotech Proposal (Pre-Exhibit Activities) | 8, 9, 10 | Group dynamics |
| Biotech Proposal (Exhibit)  Venue: DLSU-STC | 10, 11, 12 | Proposal Presentation |
| Long Exam/ Film Showing/Course Synthesis | 12, 13 | Reflection Paper Writing |

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| **References** |

**Required Text:**

Herren, R.V. 2013. Introduction to Biotechnology: An Agricultural Revolution. 2nd edition. Delmar Cengage

Learning, New York, USA. 409pp.

**Recommended Text:**

Mendoza, E.T. 2006. Understanding Biotechnology. National Academy of Science and Technology, Philippine

Science Heritage Foundation, Inc. Manila, Philippines 54 pp.

**Suggested Readings for the course:**

Pocket Ks (Pockets of Knowledge). 2006-2007. Global Knowledge Center on Crop Biotechnology. International Service for the Acquisition of Agri-biotech Applications (ISAAA).

Available at: http://www.isaaa.org/Kc

Malacinski, G.M. 2006. *Essentials of Molecular Biology*. Jones and Barlett Publishers, Canada.

Barnum, S.R. 2005. *Biotechnology An Introduction* . Thomson Brooks Cole, USA.

F. Fukuyama (Ed) 2002. *Our Posthuman Future: Consequences of the Biotechnology Revolutio*n. Farrar, Straus, and Giroux. New Jersey, USA.

G. Walsh (Ed.) 2002. *Proteins: Biochemistry and Biotechnology*. John Willey and Sons, Ltd. West Sussex, England.

J.M. Walker and R. Rapley (Eds.) 2000. *Molecular Biology and Biotechnology*. 4th edition. The Royal Society of Chemistry, Thomas Graham House. Science Park, Milton Road, Cambridge CB4 OWF, UK.

B.R. Glick and J.J. Pasternak (Eds.) 1998. *Molecular Biotechnology, Principles and Applications of* *Recombinant DNA*. 2nd edition. ASM Press, Washington D.C.

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| **Online Resources** |

<http://ivle.dlsu.edu.ph>

http://www.accessexcellence.org/AB/BC/

The Board of Regents of the University of Wisconsin System. (2007). Available at http://www.biotech.wisc.edu/Education/Poster/backmaster.html “Biotechnology: tools for genetic ingenuity

Course Educator, Inc. (2010). Available at http://www.amgen.com/rnd/history.html

The Board of Regents of the University of Wisconsin System.(2007). Available at

http://www.biotech.wisc.edu/Education/Poster/backmaster.html

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| **Class Policies** |

* Honesty and integrity are integral components of the academic process.
* Absence and tardiness are strongly discouraged.
* Attentiveness and active participation are critical to successful learning.
* The use of mobile phones and other electronic devices is not allowed during class hours, unless necessary or upon the teacher’s approval.
* The policies on academic dishonesty, attendance, and behavior stipulated in your Student Handbook are honored in this course.

Approved by

**Dr. Mary Jane C. Flores**

Chair, Department of Biology