UNIVERSITI TEKNOLOGI MARA

EVT638: ENVIROMENTAL MICROBIOLOGY AND BIOTECHNOLOGY

Course Name (English)	ENVIROMENTAL MICROBIOLOGY AND BIOTECHNOLOGY APPROVED
Course Code	EVT638
MQF Credit	4
Course Description	This course introduces the fundamental principles of microbiology and its applications in biotechnology for environmental protection. The course discusses on the applications of microbiology and biotechnology for sustainable environmental management such as in bioremediation and clean technology. Additionally, the involvement of genetic engineering in environmental protection and relevant current issues in biotechnology also will be discussed. Laboratory exercises on related topics such as identification of microorganisms and bioremediation of environmental pollutants will be carried out to provide hands-on experiences to the students
Transferable Skills	- Performs microbiological laboratory experiments. - Writes proper laboratory reports and two essays on selected topics in biotechnology.
Teaching Methodologies	Lectures, Lab Work, Web Based Learning, Simulation Activity, Discussion
CLO	CLO1 1. Perform microbiology methods to survey, culture, stain and identify microorganisms CLO2 2. Evaluate the suitability of biotechnology applications in environmental protection. CLO3 3. Report in writing on laboratory findings and selected issues in biotechnology development.
Pre-Requisite Courses	No course recommendations

Topics
1. 1.0 Introduction to Environmental Microbiology. 1.1) Microbial ecology and diversity. 1.2) Microbial metabolisms. 1.3) Microbial genetics.
2. 2.0 Detection, Enumeration and Identification of Microorganisms. 2.1) Sample collection and processing. 2.2) Microscopic and cultural techniques. 2.3) Physiological and immunological methods. 2.4) Analysis of nucleic acids. 2.5) Indicator organisms and biosensors.
3. 3.0 Bioremediation of Environmental Pollutants. 3.1) Principles of bioremediation. 3.2) Microorganisms and organic pollutants. 3.3) Microorganisms and metal pollutants. 3.4) Wastewater treatment and disinfection. 3.5) Biological Treatment of air pollutants. 3.6) Phytoremediation.
4. 4.0 Clean Technology and Pollution Control. 4.1) Enzyme technology. 4.2) Industrial biotechnology. 4.3) Agriculture biotechnology. 4.4) Biofuels and Biopolymers.

5. 5.0 Genetic engineering and Current Issues.
5.1) Recombinant DNA technology and the environment.
5.2) Ethics and regulations in biotechnology.
5.3) Current issues in biotechnology.

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Assignment	20%	CLO1
Test	Test	20%	CLO2
Written Report	Lab Report	20%	CLO3

Reading List

Recommended Text

- **Pepper, I. L., Gerba, C. P. & Gentry, T. 2015, *Environmental Microbiology*, 3 Ed., Elsevier Science Publishing Co., Academic Press Inc. SD USA.**
- **Mukherjee, J., 2014, *Environmental Microbiology and Biotechnology: Progress and Prospects„* Wiley Online Library.**
- **Khan, M.Y., Khan, F. 2015, *Principles of Enzyme Technology,*, PHI Learning Pte. Ltd. Bangalore.**

Article/Paper List: This Course does not have any article/paper resources

Other References: This Course does not have any other resources