UNIVERSITI TEKNOLOGI MARA

BMS635: MICROBIAL BIOTECHNOLOGY

Course Name (English)	MICROBIAL BIOTECHNOLOGY APPROVED
Course Code	BMS635
MQF Credit	3
Course Description	This course provides an overview of how microbes (e.g., bacteria, viruses and yeast) are manipulated to solve practical problems through biotechnology. Topics include basics in microbial life, ecology and metabolism, methods used in microbial technology, industrial microbiology, microbes in drug development, interactions between microbes, plants and animals; food microbiology, the gut microbiota, metagenomics and others
Transferable Skills	Preparing of samples for lab investigation, Performing various lab test and assays, Skills developed during practical classes and assessed by practical reports
Teaching Methodologies	Lectures, Practical Classes, Web Based Learning, Discussion
CLO	CLO1 Elaborate on the applications of microbial biotechnology in the industrial, medical, environmental and food sectors as alternative technologies CLO2 Perform laboratory experiments in microbial biotechnology and report the findings CLO3 Demonstrate managerial skills in carrying out a group task in microbial biotechnology
Pre-Requisite Courses	No course recommendations

Topics
1. Introduction to Microbial Biotechnology 1.1) Fundamentals of Microbial Biotechnology 1.2) Microbial Cell Structure and Function 1.3) Bioenergetics, Enzymes and Metabolism
2. Methods in Microbial Biotechnology 2.1) Recombinant Gene Expression in Prokaryote 2.2) Recombinant Gene Expression in Eukaryote 2.3) Protein Engineering and Expression
3. Industrial Microbial Biotechnology 3.1) Commercial Products 3.2) Bio-based products 3.3) • Biofertilizers 3.4) • Biopolymers 3.5) • Biopesticides 3.6) • Biosurfactants 3.7) • Biosensors 3.8) • Bioconversion
4. Pharmaceutical/Medical Microbial Biotechnology 4.1) Therapeutic proteins 4.2) • Insulin 4.3) • Antibiotics 4.4) • Recombinant Vaccine 4.5) • Monoclonal Antibodies 4.6) Drugs 4.7) Gene Therapy

5. Food Microbial Biotechnology 5.1) Overview of food biotechnology 5.2) Factors effecting growth of microbes in dairy and meat products 5.3) Application of microbes in food biotechnology 5.4) • Fermentation 5.5) • Probiotics 5.6) • Control of pathogens in food (bacteriophage)
6. Environmental Biotechnology 6.1) Basic Metagenomics 6.2) Biofuels 6.3) Biorefinery

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Written Group Assignment	10%	CLO3
Practical	Written Report	20%	CLO2
Test	Theory Test	20%	CLO1

Reading List

Recommended Text

- **Farshad Darvishi Harzevili and Hongzhang Chen 2017, *Microbial Biotechnology: Progress and Trends.*, CRC Press**
- **Pratyoosh Shukla 2016, *Microbial Biotechnology: An Interdisciplinary Approach*, CRC Press**

Article/Paper List

This Course does not have any article/paper resources

Other References

- **Book Yuan Kun Le 2013, *Microbial Biotechnology Principles and Applications* , Scientific Publishing Co Pte Ltd**
- **Book Clark and Pazdernik 2016, *Biotechnology. 2nd Edition*, AP Cell**
- **Book William J. Thieman and Michael A. Palladino 2013, *Introduction to Biotechnology*, Pearson Education**
- **Book Bhima Bhuky and Anjana Devi Tangutur 2015, *Microbial Biotechnology: Technological Challenges and Developmental Trend* , Academic Press**
- **Book W.T. Godbey*An Introduction to Biotechnology: The Science, Technology and Medical Applications* , Academic Press**