UNIVERSITI TEKNOLOGI MARA

BMS537: METHODS IN RECOMBINANT DNA TECHNOLOGY

Course Name (English)	METHODS IN RECOMBINANT DNA TECHNOLOGY APPROVED
Course Code	BMS537
MQF Credit	4
Course Description	This course introduces students to the basic recombinant DNA technology toolbox. Techniques such as DNA extraction, gel electrophoresis, gene cloning, restriction enzyme mapping, DNA hybridization, DNA sequencing and polymerase chain reaction are taught and the mechanism behind them explained. The course is very much hands-on in nature, supplemented by lectures and tutorial. This will ensure that students have the necessary skills and understanding to learn more esoteric techniques and to understand the applications of recombinant DNA technology in research. The lab sessions will be run in workshop-style for maximal hands-on benefits
Transferable Skills	Sample preparation, reaction setup, experimental design, data analysis, report writing
Teaching Methodologies	Lectures, Blended Learning, Practical Classes
CLO	CLO1 Explain the mechanisms underlying basic methods in recombinant DNA technology CLO2 Illustrate using specific examples how recombinant DNA technology can be used to solve problems CLO3 Perform experiments in basic recombinant DNA techniques CLO4 Demonstrate written communication skills in scientific writing
Pre-Requisite Courses	No course recommendations

Topics
1. DNA extraction from living cells 1.1) Total cell DNA 1.2) Plasmid DNA 1.3) Bacteriophage DNA
2. Manipulating purified DNA 2.1) DNA manipulative enzymes: Nucleases, polymerases and DNA-modifying enzymes 2.2) Restriction endonucleases 2.3) Restriction mapping 2.4) DNA ligase
3. Vectors and hosts 3.1) Cloning vectors for E. coli and eukaryotes 3.2) Prokaryotic and eukaryotic hosts
4. DNA delivery 4.1) Transformation 4.2) Transfection
5. Strategies for cloning 5.1) Polymerase Chain Reaction 5.2) Genomic libraries 5.3) Methods of clone identification
6. Analysis of DNA 6.1) Chain termination DNA sequencing 6.2) Next Generation Sequencing 6.3) DNA hybridization -FISH

7. Application of Gene Cloning and DNA Analysis
7.1) Gene expression in prokaryotic cells
7.2) Gene expression in eukaryotic cells
7.3) Genetic fingerprinting

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Assignment on application of rDNA technology	15%	CLO4
Test	Online test on concepts of recombinant DNA	20%	CLO1
Written Report	Practical reports	15%	CLO3

Reading List

Recommended Text

- **T. A. Brown 2016, *Gene Cloning and DNA Analysis*, 7th Ed., John Wiley & Sons [ISBN: 9781119072560]**
- **Ralph Rapley,David Whitehouse 2014, *Molecular Biology and Biotechnology*, 6th Ed., Royal Society of Chemistry [ISBN: 9781849737951]**

Reference Book Resources

- **Mark F. Sanders,John L. Bowman 2018, *Genetic Analysis*, 3rd Ed., Pearson [ISBN: 9780134818740]**
- **Sardul Singh Sandhu 2010, *Recombinant DNA Technology*, I. K. International Pvt Ltd [ISBN: 9789380578446]**

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

Other References: This Course does not have any other resources