

**SEMESTER I & II**  
**LSM2191 LABORATORY TECHNIQUES IN LIFE SCIENCES**

**Prerequisite:** LSM1102 or LSM1106

**Workload:** 12 lecture hours + 8 tutorial hours + 40 practical hours

**Course description:**

This module introduces the theory and practical applications of techniques used in molecular biology and protein biochemistry. Knowledge in recombinant DNA techniques, such as RNA isolation, reverse transcription, polymerase chain reaction, recombinant DNA construction and recombinant protein expression; and in protein purification, such as liquid chromatography, polyacrylamide gel electrophoresis and western blotting, will be integrated with laboratory practice.

S/N	Topics	Lecture hours	
		Sem 1	Sem 2
1	Overview and RNA Methodologies: RNA Isolation and mRNA Expression	1.5h (Jinlu WU)	1.5h (NL)
2	Molecular Cloning I	1.5h (Jinlu WU)	1.5h (NL)
3	Molecular Cloning II	1.5h (Jinlu WU)	1.5h (NL)
4	DNA Sequencing	1.5h (Jinlu WU)	1.5h (NL)
5	Protein expression and extraction including buffer preparation	1.5h (Jinlu Wu)	1.5h (MC)
6	Chromatographic methods: ion exchange, gel filtration and affinity chromatography	1.5h (Jinlu Wu)	1.5h (MC)
7	Electrophoresis and Western blot	1.5h (Jinlu Wu)	1.5h (MC)
8	Strategies for developing protein purification methods	1.5h (Jinlu Wu)	1.5h (MC)
	<b>Practicals/Tutorials:</b>	48h	48h
	<b>Total hours:</b>	60h	60h

**TEXT BOOK:**

(1) Current Protocols in Molecular Biology by Fred M. Ausubel et al, John Wiley & Sons, Inc.

(2) Protein Purification: Principles, High Resolution Methods, and Applications, Third Edition, edited by Jan-Christer Janson, Wiley.

**MODE OF ASSESSMENT:**

50% - Lab reports

50% - Continuous Assessments

**MODULE CO-ORDINATORS:**

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