SEMESTER I & II
LSM1401 FUNDAMENTALS OF BIOCHEMISTRY

Prerequisite: GCE 'A' Level or H2 Chemistry or equivalents or CM1417 or CM1417X
Workload: 22 lecture hours + 10 tutorial hours + 6 e-laboratory sessions

This module aims to provide the student with a strong background in the fundamental aspects of the biochemistry of biomolecules including selected topics of cell biology, microbial systems, and molecular genetics with an emphasis on their application to chemical and pharmaceutical industries as well as engineering practices (in particular bioengineering, chemical engineering, environmental engineering, and engineering science). Upon completing this module, the student is expected to have sufficient knowledge of fundamental life processes in order to appreciate and relate the importance of biochemistry in industry as well as in everyday life. The student should also be well prepared to take other advanced modules as well in which biochemistry is a prerequisite.

S/N	Topics	Lecture Hours
1	**Introduction to Biochemistry, Bioengineering, Biotechnology**	2
2	**Biomolecules, Biopolymers, Biomaterials** • Fats, oils, lipids, hydrophobic effect, and fluid membranes • Rubber, monomer/polymer, condensation, carbohydrates, and fibers • Nylon, polyamide/peptide bond, and fibrous proteins • DNA, phosphodiester bonds, hybridization, and PCR • Catalysts, enzymes, and protein machines	10
3	**Energy and Metabolism** • Gasoline and Ethanol, extracting energy from lipids and sugars • Storing energy in carbon, biofuels, glycogen, lipid bodies • Capturing energy from a photon • Chemistry of lipids and sugars	6
4	**Biological Information** • Encoding information in sequences and shape • Transcribing and translating bioinformation	6
		Lectures: 24h Tutorials: 10h eLaboratory Sessions: 6 × 2h= 12h CAs= 4h

TEXTBOOKS:

<Biochemistry: A Short Course> by John L. Tymoczko; Jeremy M. Berg; Lubert Stryer, 2nd Edition, 2013. WH Freeman (Semester I)

Fundamentals of Biochemistry (5th Edition, Wiley, 2016). Donald Voet, Judith G. Voet and Charlotte W. Pratt. (Semester II)

MODE OF ASSESSMENT: 100% Continual Assessment

MODULE CO-ORDINATORS & LECTURERS:

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