**MBMB 1236A: BIOENERGETICS AND CARBOHYDRATE METABOLISM**

Course outline and Schedule

Lecturer in charge: Katherine Pere

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| **Week** | **Topic** | **Details** |
| 1 | Introduction to metabolism, Digestion, absorption and transport of food in the body system, Bioenergetics | Definitions, Differences types of metabolism, Steps of digestion carbohydrates, Bioenergetics |
| 2 | Cellular respiration and regulation | Glycolysis definition, phases, importance, types, fates of pyruvate and Cori cycle, regulation of glycolysis |
| 3 | Cellular respiration and regulation | Krebs cycle, Regulation of Krebs’s cycle, anaplerotic reactions, electron transport chain (ETC) coupled to oxidative phosphorylation, importance of ETC and oxidative phosphorylation, Inhibitors and uncouplers of ETC/oxidative phosphorylation |
| 4 | Gluconeogenesis and Feeder pathways of glycolysis and | Definition of gluconeogenesis, substrates of gluconeogenesis, importance of gluconeogenesis, Alanine cycle and its importance in carbohydrate metabolism, Fructose, galactose, lactose, maltose, sucrose metabolism |
| 5 | Glycogen metabolism | Glycogen synthesis and breakdown, importance of glycogen in the body system |
| 6 | Mid semester CAT |  |
| 7 | Pentose phosphate pathway and Rapport Luebering pathway | Definition, phases, importance, regulation, Rapport Luebering pathway and its importance in red blood cells |
| 8 | Uronic acid pathway and glyoxylate pathway | Uronic acid pathway and its importance, glyoxylate pathway and its medical importance |
| 9 | Hormonal regulation of carbohydrate metabolism | Insulin and glucagon and other hormones |
| 10 | Clinical correlation of carbohydrate metabolism | Inborn errors of metabolism and storage diseases |
| 11 | Revision |  |
| 12 | End semester CAT |  |

**Teaching Methodology:**

Lectures, group discussions and presentations, assignments and practicals.

**Instructional Materials/Equipment:**

White board, handouts and instructional videos.

**Course Assessment:**

Coursework 40%

-Continuous assessment tests and assignments (CATS) - 25 marks

-Assignments and group work- 5 marks

-Practical reports – 10 marks

End of Semester Examination 60%

Total 100%

**CORE TEXT BOOKS**

1. David L.N. and Michael M.C., 2008. Lehninger Principles of Biochemistry. Palgrave Macmillan, New York. U.S.A.
2. Lubert Stryer, Biochemistry, 2006. 6th Edition, WH Freeman,
3. Mary K.C. and Shawn O. F., 2007. Biochemistry; 6th ed. Brooks Cole, Califonia. U.S.A.