

Lecture plan for M.F.Sc. 2nd semester

Department of Fish Physiology and Biochemistry

Course – Metabolism of Biomolecules

Course code- FPB-504

Credit hrs. 3(2+1)

Theory

<i>Sl no.</i>	<i>Topic</i>	<i>No of lecture</i>
1.	Introduction to Carbohydrate Metabolism & Glycolysis	1
2.	The Tricarboxylic Acid (TCA) Cycle: Enzymatic steps, stoichiometry, and metabolic energetic yield.	1
3.	Pentose Phosphate Pathway (PPP) — Oxidative and non-oxidative phases, NADPH generation.	1
4.	Gluconeogenesis: regulation and physiological significance	1
5.	Glycogen Metabolism: Glycogenesis, glycogenolysis, and reciprocal control	1
6.	Biosynthesis of fatty acids: Fatty Acid Synthase (FAS) complex, acetyl-CoA transport, and condensation steps.	1
7.	Oxidation of fatty acids: β -oxidation of saturated and unsaturated fatty acids, bioenergetics.	1
8.	Ketone body synthesis (Ketogenesis), utilisation, and regulation during starvation.	2
9.	Fatty acid modification: Desaturation and elongation mechanisms in the endoplasmic reticulum/mitochondria.	2
10.	Regulation of fatty acid metabolism	2
11.	Electron Transport Chain (ETC)	1
12.	Chemiosmotic theory, proton motive force, and F_0F_1 ATP Synthase structure and mechanism.	2
13.	Nitrogen balance: Transamination (aminotransferases) and oxidative deamination mechanisms.	2
14.	Biosynthesis of non-essential amino acids from metabolic intermediates.	1
15.	De novo biosynthesis of purine nucleotides and regulation.	1
16.	De novo biosynthesis of pyrimidine nucleotides and salvage pathways.	3

17.	Catabolism of purines and pyrimidines;	1
18.	Water-soluble and fat-soluble vitamin coenzymes in intermediary metabolism	
19.	Essential macro- and trace minerals: Co-factors and metabolic roles	
20.	Xenobiotic Metabolism	
Total no of lecture		28

Practical

Sl no.	Practical	No of lecture
01.	Preparation of tissue homogenate for enzymatic assay	1
02.	Enzymatic estimation of Lactate Dehydrogenase (LDH)	1
03.	Enzymatic estimation of Malate Dehydrogenase (MDH).	1
04.	Assessment of transaminases: Aspartate Aminotransferase (AST)	1
05.	Assessment of transaminases: Alanine Aminotransferase (ALT).	1
06.	Spectrophotometric determination of Acetylcholinesterase (AChE) activity.	1
07.	Estimation of end products of carbohydrate metabolism: Pyruvate assay.	1
08.	Estimation of end products of anaerobic metabolism: Lactate assay.	1
Total No of Practical		8

Susmita Rani

Course Teacher- Ms. Susmita Rani