ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM.

V SEMESTER **BIOCHEMISTRY** TIME: 3hrs/week

BCH 5801 (3) **INTERMEDIARY METABOLISM - I** Marks: 100

w.e.f 2015 – 2018 ("15AC") **SYLLABUS**

OBJECTIVES: The students will be able to:

- Understand how the biomolecules are utilized in the body
- Gain knowledge about the various metabolic processes

COURSE:

UNIT - I: INTRODUCTION TO METABOLISM – General features of metabolism, experimental approaches to study metabolism; use of intact organism, bacterial mutants, tissue slices, stable and radioactive isotopes.

BIOENERGETICS –energy transformation in living systems, free energy concept, exergonic and exdergonic reaction, high energy compounds and their role.

UNIT - II: BIOLOGICAL OXIDATION – Redox reactions, Redox potential Structure of mitochondria (review), mitochondrial electron transport chain components, sites of phosphorylation, inhibitors, oxidative phosphorylation – inhibitors, uncouplers chemiosmotic theory of ATP synthesis and transport of reducing potentials into mitochondria. Formation of reactive oxygen species and their disposal through enzymatic reactions.

UNIT - III: CARBOHYDRATE METABOLISM – Reactions and energetics of glycolysis, TCA cycle, Gluconeogenesis, glycogenesis and glycogenolysis. Interconversion of monosaccharides. Reactions and physiological significance of Pentose Pathway. Alcoholic and lactic acid fermentations. Photosynthesis – a brief review. Calvin cycle, C_4 pathway of carbon dioxide fixation.

UNIT- IV: LIPID METABOLISM – Hydrolysis of triacylglycerols, transport of fatty acids into mitochondria, β-oxidation of saturated fatty acids, ATP yield from fatty acids oxidation. Biosynthesis of saturated and unsaturated fatty acids. Metabolism of ketone bodies, oxidation of unsaturated and odd chain fatty acids. Biosynthesis of triglycerides and important phospholipids, glycolipids, sphingolipids and cholesterl. Regulation of cholesterol metabolism.

UNIT - V: Inborn errors of carbohydrate and lipid metabolisms.

REFERENCES:

1. Rama Rao, A.V.S.S. (1989) Text Book of Biochemistry, L.K. & S Publishers, Visakhapatnam.
2. Comn, E.E. and Stump, P.K. (1989) Outline of Biochemistry. Wiley Eastern Ltd., New Delhi.
3. Kleiner, I.S. and Orten, J.M. (1979) Biochemistry. C.V. Mosby & Co., St. Louis.
4. Swaminathan, M (1981) Biochemistry For Medical Students, Geeta Book House Publishers, Mysore.
5. Kuchel , P.W. and Ralston, G.B. (1988) Theory And Problems Of Biochemistry, Mc Graw Hill Book Co., New York.

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ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM.

V SEMESTER **BIOCHEMISTRY** TIME: 3hrs/week

BCH 5851 (2) **INTERMEDIARY METABOLISM - I** Marks: 50

w.e.f 2015 – 2018 ("15AC") **PRACTICAL SYLLABUS – III A**

1. Estimation of pyruvate
2. Estimtion of phosphorous by fiske subbarow method
3. Estimation of alcohol by colorimetric method
4. Estimation of glucose by nelson somogyi method
5. Estimation of glucose by benedicts method
6. Estimation of cholesterol

REFERENCES:

1. Plummer, D.T.(1979) An Introduction to Practical Biochemistry, Tata MC Graw Hill Book Co., Bombay.
2. Oser, B.L.(1961) Hawk's Physiological Chemistry, Tata MC Graw Hill Book Co. Bombay.

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ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM.

VSEMESTER **BIOCHEMISTRY** TIME: 3Hrs/week

BCH 5802(3) **INTERMEDIARY METABOLISM - II** MARKS: 100

w.e.f 2015 – 2018("15AC") **SYLLABUS**

OBJECTIVES: The students will be able to:

- Understand how the biomolecules are utilized in the body
- Gain knowledge about the various metabolic processes

COURSE:

UNIT - I: AMINO ACID METABOLISM – General reactions of amino acid metabolism:transamination, oxidative deamination and decarboxylation.Urea cycle. Degradation and biosynthesis of aromatic & branched chain amino acids Glycogenic and ketogenic amino acids. Inborn errors of amino acid metabolism.

UNIT- II: NUCLEOTIDE METABOLISM – Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine synthesis.

Inborn Errors of Nucleotide metabolism.

UNIT - III: PORPHYRIN METABOLISM – Biosynthesis and degradation of porphyrins. Production of bile pigments. Inborn Errors of Porphyrin metabolism.

UNIT - IV: FAT SOLUBLE VITAMINS AND WATER SOLUBLE VITAMINS –

FAT SOLUBLE VITAMINS – Structure, sources, biochemical role and deficiency disorders.

Minerals: Trace elements and their disorders.

WATER SOLUBLE VITAMINS – Structure, sources, biochemical role and deficiency disorders

UNIT-V:NUTRITIONAL BIOCHEMISTRY Balanced diet, Calorific values of foods and their determination by bomb calorimeter. BMR and factors affecting affecting it specific dynamic action (SDA) of foods. energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women. Sources of complete and incomplete proteins. Biological value of proteins .Role of essential fatty acids in human nutrition.Malnutrition- Kwashiorkar, Marasmus and PEM

REFERENCES:

1. Rama Rao, A.V.S.S. (1989) Text Book of Biochemistry, L.K. & S Publishers, Visakhapatnam.
2. Comn, E.E. and Stump, P.K. (1989) Outline of Biochemistry. Wiley Eastern Ltd., New Delhi.
3. Kleiner, I.S. and Orten, J.M. (1979) Biochemistry. C.V. Mosby & Co., St. Louis.
4. Swaminathan, M (1981) Biochemistry For Medical Students, Geeta Book House Publishers, Mysore.
5. Kuchel , P.W. and Ralston, G.B. (1988) Theory And Problems Of Biochemistry, Mc Graw Hill Book Co., New York.
6. Goodhart, R.S., & Shils M.E. (1980) – Modern Nutrition in Health and Disease – K.M.Varghese & Co., New Delhi.
7. Davidson, S., and Passmre, R. (1977) – Human Nutrition and Dietetics – E & S., Livinstone Ltd., London.

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ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM.

VSEMESTER **BIOCHEMISTRY** TIME: 2Hrs/week

BCH 5852(2) **INTERMEDIARY METABOLISM - II** MARKS: 50

w.e.f 2015 – 2018("15AC") **PRACTICAL SYLLABUS – III B**

1. Estimation of urea
2. Estimation of uric acid
3. Estimation of ascorbic acid
4. Estimation of iron
5. Isolation of DNA from onions
6. Qualitative test of urine for identification of bilirubin uroporphyfrins and heam
7. Estimation of calcium by titrimetry .
8. Isolation of casein lactose from milk.
9. Determination of acid value of an oil .
10. Extraction & estimation of lipid from oil seeds (ground nut)

REFERENCES:

1. Plummer, D.T.(1979) An Introduction to Practical Biochemistry, Tata MC Graw Hill Book Co., Bombay.
2. Oser, B.L.(1961) Hawk's Physiological Chemistry, Tata MC Graw Hill Book Co. Bombay.