

**SARDAR PATEL UNIVERSITY**  
**Programme: MSC (Integrated Biotechnology)**  
**Semester: IV**  
**Syllabus with effect from: December 2011**

<b>Paper Code:</b> PS04CIGB01	<b>Total Credits: 3</b>
<b>Title Of Paper:</b> Bioenergetics	

Unit	Description in detail	Weightage (%)
<b>1</b>	<b>Basic Of Bioenergetics :-</b> Energy transformation, Laws of thermodynamics, entropy, free energy of reaction, Biological oxidation-reduction reactions, standard redox potentials, Hydrolysis of energy rich intermediates and ATP, Respiratory transport, Electron Transport and Proton pump, Oxidative Phosphorylation and ATP synthesis, conformational changes and chemiosmotic theory, central dogma of energy transduction.	
<b>2</b>	<b>Glycolysis, Gluconeogenesis, and Pentose Phosphate Pathway:-</b> Glycolysis, Gluconeogenesis, Regulation of glycolysis and Gluconeogenesis, Pentose Phosphate Pathway, Glycogenesis and glycogenolysis.	
<b>3</b>	<b>The Tricarboxylic Acid Cycle: -</b> Discovery of the TCA Cycle, Steps in the TCA Cycle, Stereo chemical Aspects of TCA Cycle Reactions, ATP Stoichiometry of the TCA Cycle, Thermodynamics of the TCA Cycle, the Amphibolic Nature of the TCA Cycle, the Glyoxylate Cycle, Oxidation of other Substrates by the TCA Cycle, Regulation of TCA Cycle Activity	
<b>4</b>	<b>Metabolism of Nucleic acid: -</b> Regulation of Biosynthesis of purines and pyrimidines, Degradation of purines and pyrimidines, Regulation of purines and pyrimidines biosynthesis and degradation.	
	<b>Practical:</b>	
	<ul style="list-style-type: none"> <li>• Estimation of protein by Folin-Lowry method.</li> <li>• Estimation of RNA by orcinol method.</li> <li>• Estimation of total sugar by Cole's method.</li> <li>• Estimation of reducing sugar by Benedict's method.</li> <li>• Estimation of SGOT by enzymatic method.</li> <li>• Estimation of SGPT by enzymatic method.</li> <li>• Separation of amino acid by TLC method</li> </ul>	

**Basic Text & Reference Books:**

- Biochemistry by Lubert Stryer, W. H. Freeman and Company. 4th /6<sup>th</sup> edition, 2000/2004 Hardback, ISBN 0716720094
- FUNDAMENTALS OF BIOCHEMISTRY: Life at the Molecular Level, by D. Voet, J. G. Voet, and C. Pratt, 3rd Edition, John Wiley and Co John Wiley & Sons, Inc., New York, , 2008 ISBN : 0471214957; 9780471214953
- Principles of Biochemistry by Albert Lehninger, W.H. Freeman & Company; 3rd edition (February 2000), ISBN-10: 1572591536
- Harper's Biochemistry : Harper, 27<sup>th</sup> Edition, McGraw-Hill Publishing Co; Robert K. Murray, Daryl K. Granner, Victor W. Rodwell, 2006 ISBN-10: 0071461973
- Out lines of Biochemistry by Conn E E , Stumps P E and and Doi, R.H., John Wiley and sons, Singapore, 5<sup>th</sup> Edition - 2001
- Principles of Biochemistry by Horton, Morgan, Secrimgeour, Perry, Rawn , pearson International edition – 4<sup>th</sup> edition ISBN 978-1-4058-2573-3



- **TEXTBOOK OF MEDICAL BIOCHEMISTRY** 7<sup>th</sup> edition (pb) 2007. **CHATTERJEE M N and Rana shinde** JAYPEE BROTHERS MEDICAL PUBLISHERS PVT LTD.. ISBN: 8184481349
- Harper's Biochemistry: R. K. Murray and others. Appleton and Lange, Stanford. MCGRAW-HILL BOOK COMPANY **ISBN: 0838536905 25 edition (pb) 2000**
- Plummer, D.T. (1987). 3rd ed. An introduction of Practical Biochemistry. McGraw Hill Book Co.

