

<b>Programme</b>	BS Botany	<b>Course Code</b>	<b>BOT-303</b>	<b>Credit Hours</b>	2
<b>Course Title</b>	<b>Advanced Plant Biochemistry ( Theory)</b>				
<b>Introduction</b>					
<p>This course is focused on Bioenergetics and Metabolism with a focus on energy relationships between catabolic and anabolic processes. How do the catabolic pathways deliver chemical energy? How are energy carrier molecules used in anabolic pathways? These are some of the questions that are answered making use of our knowledge of fatty acid catabolism, biosynthesis of nucleotides etc. An insight to Alkaloids, Terpenoids and Vitamins is also presented with a focus on their general properties or role in metabolism.</p>					
<b>Learning Outcomes</b>					
<ul style="list-style-type: none"> <li>• Students are expected to get themselves familiarized with the key concepts of Bioenergetics and Metabolism.</li> <li>• They should be able to figure out the use of various biochemical reactions and to assess as to where do these individual chemical reactions fit in an overall metabolic process.</li> <li>• The students are expected to critically analyze the various biochemical pathways and their interaction with each other.</li> <li>• Students should be able to highlight the significance of Alkaloids, Terpenoids and Vitamins and the role they might play in a living system</li> </ul>					
<b>Course Contents</b>					
<p><b>Bioenergetics</b></p> <ul style="list-style-type: none"> <li>• Bioenergetics and Thermodynamics.</li> <li>• Oxidation and Reduction in living systems.</li> </ul> <p><b>Metabolism</b></p> <ul style="list-style-type: none"> <li>• Breakdown of fats with special reference to beta-oxidation, its energy balance and comparison with carbohydrate metabolism.</li> <li>• DNA replication. Fundamental rules. Nucleases. DNA polymerases. Fidelity of DNA replication. Nick translation. DNA repair.</li> <li>• Genetic code. Components of protein synthesis. Protein synthesis: Initiation, elongation, termination and post-translational modifications.</li> </ul> <p><b>Alkaloids</b></p> <ul style="list-style-type: none"> <li>• Occurrence, physiological effects, chemical nature with special reference to Solanine, Nicotine, Morphine, Theine and Caffeine.</li> <li>• Aflatoxins, their nature and role.</li> </ul> <p><b>Terpenoids:</b></p> <ul style="list-style-type: none"> <li>• Classification: Monoterpenes, Sesquiterpenes, Diterpenes, Triterpenes, Tetraterpenes, Polyterpenes, their chemical constitution and biosynthesis.</li> </ul> <p><b>Vitamins:</b> General properties and role in metabolism.</p>					