

<b>Course Title:</b>				<b><u>Biology for Engineers</u></b>					
<b>Course Code:</b>				<b><u>BTL BS102</u></b>					
<b>Course Coordinator</b>				<b><u>VINOD SINGH</u></b>					
<b>Credits</b>				<b><u>3-1-0</u></b>					
<b>Evaluation Scheme Total 100 Marks</b>									
<b>Quiz (Total 20 Marks)</b>				<b>Assignment/Project (Total 20 marks) (Minimum Two Assignments or one Project)</b>		<b>Mid-Term</b>	<b>Major Examination</b>	<b>Total</b>	
<b>Quiz I (5 marks)</b>	<b>Quiz II (5 marks)</b>	<b>Quiz III (5 marks)</b>	<b>Quiz IV (5 marks)</b>			<b>20 marks) (1 ½ Hour Duration)</b>	<b>(40 marks) (3 Hour Duration)</b>	<b>100 Marks</b>	
<b>WEEKS</b>				<b>TOPICS TO BE COVERED</b>					
<b>Week 1</b>				<b>Cell, Cell theory, Cell shapes</b>					
<b>Week 2</b>				<b>Structure of a Cell, prokaryotic and eukaryotic Cell, Plant Cell and animal Cell, protoplasm</b>					
<b>Week 3</b>				<b>Plant Tissue and Animal Tissue, Cell cycle</b>					
<b>Week 4</b>				<b>Carbohydrates</b>					
<b>Week 5</b>				<b>Proteins, Amino acid</b>					
<b>Week 6</b>				<b>Nucleic acid (DNA and RNA) and their types</b>					
<b>Week 7</b>				<b>Enzymes and their application in Industry, Large scale production of enzymes by Fermentation</b>					
<b>Week 8</b>				<b>Gene structure: Prokaryotic gene and Eukaryotic gene structure</b>					
<b>Week 9</b>				<b>Gene replication, Transcription and Translation in Prokaryotes and Eukaryotes.</b>					
<b>Week 10</b>				<b>Gene replication, Transcription and Translation in Prokaryotes and Eukaryotes.</b>					
<b>Week 11 (17<sup>th</sup> -21<sup>st</sup> March, 2025)</b>				<b>Mid-Term</b>					
<b>2<sup>nd</sup> May, 2025</b>				<b>Showing of Mid-Term Answer Sheets</b>					
<b>Week 12</b>				<b>Recombinant DNA technology and introduction to cloning.</b>					
<b>Week 13</b>				<b>Cloning in microbes, plants and animals, transgenic plants and animals</b>					

Week 14	Brief introduction to Production of vaccines, Enzymes, antibodies
Week 15	Basics of biosensors, biochips, Bio fuels
Week 16	Tissue engineering and its application, Stem cell and applications, Bio engineering (production of artificial limbs, joints and other parts of body).
Week 17 (5 <sup>th</sup> -9 <sup>th</sup> May, 2025)	Revision Week
Week 18 (13 <sup>th</sup> – 22 <sup>nd</sup> May, 2025)	Major Examinations
29 <sup>th</sup> May, 2025	Showing of Major Exams Answer Sheets

**Course Outcomes:** After successful completion of this course, students will be able to:

**CO1:** Understand the detailed structure of the cell and cell cycle.

**CO2:** Understand the structure and function of biomolecules and their importance.

**CO3:** Illustrate about genes and genetic materials (DNA & RNA) present in living organisms and how they replicate, transfer & preserve vital information in living organisms

**CO4:** Demonstrate the concept of biology and its uses in combination with different technologies for the production of medicines and production of transgenic plants and animals.

**Recommended Books:**

1. Essential Cell Biology Fifth edition by Bruce Alberts, Karen Hopkin, Alexander Johnson, David Morgan, Martin Raff, Keith Roberts, Peter Walter, WW Norton & Co.
2. Karp's Cell Biology Eighth edition by Gerald Karp, Janet Iwasa, Wallace Marshall; Wiley.
3. Biology for Engineers by T Johnson press, 2011
4. The Cell: A Molecular Approach Fifth edition by Cooper, G.M. and Hausman, R.E. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, M.A.
5. Lehninger: Principles of Biochemistry, 8th edition by David L. Nelson and Michael. M. Cox; W. H. Freeman and Company.

**Calendar of Quizzes/Assignments:**

Component	Date
Quiz-I	27 <sup>th</sup> -31 <sup>st</sup> , January 2025
Quiz-II	24 <sup>th</sup> -28 <sup>th</sup> February, 2025
Assignment-I	10 <sup>th</sup> -12 <sup>th</sup> February, 2025
Mid-Term	17-21 <sup>st</sup> March, 2025
Assignment-II/ Project Submission	21 <sup>st</sup> – 24 <sup>th</sup> April, 2025

<b>Quiz-III</b>	<b>7<sup>th</sup> – 11<sup>th</sup> April, 2025</b>
<b>Quiz-IV</b>	<b>28<sup>th</sup> April-2nd, May, 2025</b>
<b>Major Exam</b>	<b>13<sup>th</sup> – 22<sup>nd</sup> May, 2025</b>

**Note: One surprise Quiz may be fixed out of Quiz-II, Quiz-III or Quiz-IV.**

**Signature of Course Coordinator:**