



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Teaching & Examination Scheme B.Tech. : Electrical Engineering 2<sup>nd</sup> Year - IV Semester

THEORY											
SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
1	BSC	4EE2-01	Biology	2	0	0	2	20	80	100	2
2	HSMC	4EE1-02/ 4EE1-03	Technical Communication / Managerial Economics and Financial Accounting	2	0	0	2	20	80	100	2
3	ESC	4EE3-04	Electronic Measurement & Instrumentation	2	0	0	2	20	80	100	2
4	PCC	4EE4-05	Electrical Machine - II	3	0	0	3	30	120	150	3
5		4EE4-06	Power Electronics	3	0	0	3	30	120	150	3
6		4EE4-07	Signals & Systems	3	0	0	3	30	120	150	3
7		4EE4-08	Digital Electronics	2	0	0	2	20	80	100	2
		Sub Total		17	0	0		170	680	850	17
PRACTICAL & SESSIONAL											
8	PCC	4EE4-21	Electrical Machine - II Lab	0	0	4		60	40	100	2
9		4EE4-22	Power Electronics Lab	0	0	4		60	40	100	2
10		4EE4-23	Digital Electronics Lab	0	0	2		30	20	50	1
11		4EE3-24	Measurement Lab	0	0	2		30	20	50	1
13	SODE CA	4EE8-00	Social Outreach, Discipline & Extra Curricular Activities							25	0.5
		Sub- Total		0	0	12		180	120	325	6.5
		TOTAL OF IV SEMEESTER		17	0	12		350	800	1175	23.5

**L:** Lecture, **T:** Tutorial, **P:** Practical, **Cr:** Credits

**ETE:** End Term Exam, **IA:** Internal Assessment

Office of Dean Academic Affairs  
Rajasthan Technical University, Kota



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## SYLLABUS

2<sup>nd</sup> Year - IV Semester: B.Tech. (Electrical Engineering)

### 4EE2-01: Biology

Credit: 2  
2L+0T+0P

Max. Marks: 100(IA:20, ETE:80)  
End Term Exam: 3 Hours

SN	CONTENTS	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	<b>Introduction:</b> Purpose: To convey that Biology is as important a scientific discipline as Mathematics, Physics and Chemistry. Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft. Mention the most exciting aspect of biology as an independent scientific discipline. Why we need to study biology? Discuss how biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor. These examples will highlight the fundamental importance of observations in any scientific inquiry.	1
3	<b>Classification:</b> Purpose: To convey that classification <i>per se</i> is not what biology is all about. The underlying criterion, such as morphological, biochemical or ecological be highlighted. Hierarchy of life forms at phenomenological level. A common thread weaves this hierarchy Classification. Discuss classification based on (a) cellularity- Unicellular or multicellular (b) ultrastructureprokaryotes or eucaryotes. (c) energy and Carbon utilization -Autotrophs, heterotrophs, lithotropes (d) Ammonia excretion- aminotelic, uricotelic, ureotelic (e) Habitata- aquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. A given organism can come under different category based on classification. Model organisms for the study of biology come from different groups. E.coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. musculus	3
4	<b>Genetics:</b> Purpose: To convey that "Genetics is to biology what Newton's laws are to Physical Sciences". Mendel's laws, Concept of segregation and independent assortment. Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance. Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics.	3
5	<b>Biomolecules:</b> Purpose: To convey that all forms of life has the same building blocks and yet the manifestations are as diverse as one can imagine. Molecules of life. In this context discuss monomeric units and polymeric structures. Discuss about sugars, starch and cellulose. Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids.	3

Office of Dean Academic Affairs  
Rajasthan Technical University, Kota



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## SYLLABUS

2<sup>nd</sup> Year - IV Semester: B.Tech. (Electrical Engineering)

6	<b>Enzymes:</b> Purpose: To convey that without catalysis life would not have existed on earth. Enzymology: How to monitor enzyme catalysed reactions. How does an enzyme catalyse reactions? Enzyme classification. Mechanism of enzyme action. Discuss at least two examples. Enzyme kinetics and kinetic	3
7	<b>Information Transfer:</b> Purpose: The molecular basis of coding and decoding genetic information is universal. Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure- from single stranded to double helix to nucleosomes. Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination.	3
8	<b>Macromolecular analysis:</b> Purpose: To analyse biological processes at the reductionistic level. Proteins- structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements.	4
9	<b>Metabolism:</b> Purpose: The fundamental principles of energy transactions are the same in physical and biological world. Thermodynamics as applied to biological systems. Exothermic and endothermic versus endergonic and exergonic reactions. Concept of $K_{eq}$ and its relation to standard free energy. Spontaneity. ATP as an energy currency. This should include the breakdown of glucose to $CO_2 + H_2O$ (Glycolysis and Krebs cycle) and synthesis of glucose from $CO_2$ and $H_2O$ (Photosynthesis). Energy yielding and energy consuming reactions. Concept of Energy charge.	4
10	<b>Microbiology:</b> Concept of single celled organisms. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics.	3
<b>Total</b>		<b>28</b>

Office of Dean Academic Affairs  
Rajasthan Technical University, Kota