



Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

Approved by Government of Tamil Nadu and Accredited by NAAC with 'A++' Grade (3rd Cycle-3.64 CGPA)

Dr. N.G.P. - Kalapatti Road, Coimbatore-641048, Tamil Nadu, India

Web: www.drngpasc.ac.in | Email: info@drngpasc.ac.in | Phone: +91-422-2369100

2026-27 for Under Graduate Programme

(Outcome Based Education model with Choice Based Credit System)

B.Sc. Biotechnology Degree

(For the students admitted during the academic year 2026-27 and onwards)

Programme: Biotechnology

Eligibility:

A candidate who has passed in Higher Secondary Examination with any Academic Stream or Vocational Stream as one of the subjects under Higher Secondary Board of Examination and as per the norms set by the Government of Tamil Nadu or an Examination accepted as equivalent there to by the Academic Council, subject to such conditions as may be prescribed there to are permitted to appear and qualify for the **Bachelor of Biotechnology Degree Examination** of this College after a programme of study of three academic years.

Programme Educational Objectives:

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. To demonstrate a substantial understanding of concepts in key areas of Biotechnology and its applications.
2. To supplement the academic input of students by way of seminars, conferences, guest lectures and industrial visits.
3. To describe the common methods and applications of biotechnology with regards to microorganisms, plants, animals and Pharma industries.

PROGRAMME OUTCOMES:

On the successful completion of the program, the following are the expected outcomes.

PO Number	PO Statement
PO1	Students will be able to identify, analyze and understand Problems related to biotechnology and finding valid conclusions with basic knowledge in biotechnology.
PO2	Graduates will be able to justify societal, health, safety and legal issues and understand his responsibilities in biotechnological practices.
PO3	Provide education that leads to comprehensive understanding of the principles and practices of biotechnology that will help to undertake any responsibility as an individual and as a team in a multidisciplinary environment.
PO4	Graduates will be able to demonstrate knowledge of project Management when dealing with Biotechnology problems.
PO5	Students will possess hands-on technical skills necessary for Supporting biotechnology research activity and empower students with the ability to think and solve problems in the field of biotechnology.

Credit Distribution Pattern for UG Programme:

Part	Subjects	No. of Papers	Credit	Semester No.
I	Tamil /Hindi /French/Malayalam	4	4 x3 =12	I to IV
II	English	4	4 x3 =12	I to IV
III	Core (Credits 2,3,4,5)	16-19	70	I to VI
	Inter Departmental Course (IDC)	4	16	I to IV
	Discipline Specific Elective (DSE)	3	3 x4 =12	V & VI
	Skill Enhancement Course (SEC)	4	8	III, IV, V & VI
	Industrial Training	1	2	V
IV	Environmental Studies (AECC)	1	2	I
	Basic Tamil/ Advanced Tamil/ Human Rights & Womens' Rights (AECC)	1	2	II
	Generic Elective (GE) (AECC)	1	2	V
	Innovation & IPR/ Innovation, IPR & Entrepreneurship (AECC)	1	2	VI
V	NSS/NCC/YRC/RRC/Yoga/ Sports/Clubs/ Health and Wellness	-	2	I-II
TOTAL			142	

UG CURRICULUM

BIOTECHNOLOGY

AY 2026- 2027

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
First Semester												
Part - I												
26TLU1TA/ 26TLU1HA/ 26TLU1MA/ 26TLU1FA	Language - I	Tamil-I /Hindi- I/ Malayalam-I/ French-I	4	1	-	5	60	3	25	75	100	3
Part - II												
26ELU1EA	Language - II	English-I	4	-	1	5	60	3	25	75	100	3
Part - III												
26BTU1CA	Core -I	Cell Biology	4	1	-	5	60	3	25	75	100	4
26BTU1CB	Core -II	Microbiology	4	1	-	5	60	3	25	75	100	3
26BTU1CP	Core Practical- I	Cell Biology and Microbiology	-	-	4	4	48	6	40	60	100	2
26CEU1IB	IDC-I	Chemistry	4	-	-	4	48	3	25	75	100	4
Part-IV												
26CEU1AA	AECC -I	Environmental Studies	2	-	-	2	24	-	50	-	50	2
Part -V												
26BTU1XA	Extension Activity	NSS/NCC/YRC/ RRC/Yoga/Sports	-	-	-	-	-	-	50	-	50	1
Total			22	3	5	30	360	-	-	-	700	22

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits	
						Week	Total		CIA	ESE	Total		
Second Semester													
Part - I													
26TLU2TA/ 26TLU2HA/ 26TLU2MA/ 26TLU2FA	Language - I	Tami-II/Hindi-II/Malayalam-II/French-II	4	1	-	5	60	3	25	75	100	3	
Part - II													
26ELU2EA	Language - II	English-II	4	-	1	5	60	3	25	75	100	3	
Part - III													
26BTU2CA	Core -III	Genetics	4	1	-	5	60	3	25	75	100	4	
26BTU2CB	Core -IV	Biochemistry	4	1	-	5	60	3	25	75	100	3	
26BTU2CP	Core Practical-II	Genetics and Biochemistry	-	-	4	4	48	6	40	60	100	2	
26PYU2IA	IDC-II	Biophysics	4	-	-	4	48	3	25	75	100	4	
Part-IV													
26TLU2AA/ 26TLU2AB/ 26CMU2AA	AECC -II	Basic Tamil/ Advanced Tamil/Human Rights and Women's Rights	2	-	-	2	24	-	50	-	50	2	
Part -V													
26BTU2XA	Extension Activity	NSS/NCC/YRC/RRC/Yoga/Sports/Health and Wellness	-	-	-	-	-	-	50	-	50	1	
Total			22	3	5	30	360	-	-	-	700	22	

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Third Semester												
Part - I												
26TLU3TA/ 26TLU3HA/ 26TLU3MA/ 26TLU3FA	Language - I	Tamil-III/ Hindi-III/ Malayalam-III/ French-III	3	1	-	4	48	3	25	75	100	3
Part - II												
26ELU3EA	Language- II	English-III	3	1	-	4	48	3	25	75	100	3
Part - III												
26BTU3CA	Core -V	Molecular Biology	4	-	-	4	48	3	25	75	100	4
26BTU3CB	Core -VI	Biodiversity	4	-	-	4	48	3	25	75	100	4
26BTU3CP	Core Practical- III	Molecular Biology and Biodiversity	-	-	4	4	48	6	40	60	100	2
26MTU3IE	IDC-III	Basic Mathematics	4	-	-	4	48	3	25	75	100	4
26BTU3SM	SEC Practical -I	Biotechniques	2	-	4	6	72	6	40	60	100	2
Total			20	2	8	30	360	-	-	-	700	22

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Fourth Semester												
Part - I												
26TLU4TA/ 26TLU4HA/ 26TLU4MA/ 26TLU4FA	Language-I	Tamil-IV/ Hindi-IV/ Malayalam - IV/ French-IV	3	1	-	4	48	3	25	75	100	3
Part - II												
26ELU4EA	Language-II	English-IV	3	1	-	4	48	3	25	75	100	3
Part - III												
26BTU4CA	Core -VII	Immunology	5	-	-	5	60	3	25	75	100	5
26BTU4CB	Core -VIII	Bioinformatics	4	-	-	4	48	3	25	75	100	4
26BTU4CP	Core Practical-IV	Immunology and Bioinformatics	-	-	4	4	48	6	40	60	100	2
26CSU4IB	IDC-IV	Python for Biologists	4	-	-	4	48	3	25	75	100	4
26BTU4SM	SEC Practical-II	Recombinant DNA Technology	2	-	3	5	60	6	40	60	100	2
Total			21	2	7	30	360	-	-	-	700	23

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
Fifth Semester												
Part - III												
26BTU5CA	Core -IX	Plant and Animal Biotechnology	4	1	-	5	60	3	25	75	100	5
26BTU5CB	Core -X	Environmental Biotechnology	4	1	-	5	60	3	25	75	100	5
26BTU5CC	Core -XI	Entrepreneurial Biotechnology	4	1	-	5	60	3	25	75	100	5
26BTU5CP	Core Practical-V	Plant, Animal and Environmental Biotechnology	-	-	6	6	72	6	40	60	100	3
26BTU5SA	SEC-III	Bioprocess Technology	3	-	-	3	36	3	25	75	100	2
26BTU5DA	DSE-I	Clinical Trials	4	-	-	4	48	3	25	75	100	4
26BTU5DB		Bioethics and Biosafety										
26BTU5DC		Molecular Signaling										
26BTU5TA	IT	Industrial Training	-	-	-	-	-	3	40	60	100	2
Part-IV												
	GE		2	-	-	2	24	3	50	-	50	2
Total			21	3	6	30	360	-	-	-	750	28

Course Code	Course Category	Course Name	L	T	P	Instruction Hours		Exam (h)	Max Marks			Credits
						Week	Total		CIA	ESE	Total	
						Sixth Semester						
Part - III												
26BTU6CA	Core-XII	Genomics and Proteomics	4	1	-	5	60	3	25	75	100	5
26BTU6CB	Core- XIII	Bionanotechnology	4	1	-	5	60	3	25	75	100	5
26BTU6CP	Core Practical - VI	Genomics, Proteomics and Bionanotechnology	-	-	6	6	72	6	40	60	100	3
26BTU6SA	SEC-IV	Stem Cell Technology	4	-	-	4	48	3	25	75	100	2
26BTU6DA	DSE-II	Drug Design and Delivery	4	-	-	4	48	3	25	75	100	4
26BTU6DB		Biomaterials										
26BTU6DC		Synthetic Biology										
26BTU6DD	DSE-III	Biomarker Technology	4	-	-	4	48	3	25	75	100	4
26BTU6DE		Molecular Diagnostics										
26BTU6DF		Food Technology										
Part-IV												
26CIU6AA	AECC-III	Innovation and IPR	2	-	-	2	24	3	50	-	50	2
Total			22	2	6	30	360	-	-	-	650	26
Grand Total											4200	142

DISCIPLINESPECIFIC ELECTIVE

Students shall select the desired course of their choice in the listed elective course during Semesters V & VI

Semester V (Elective I)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	26BTU5DA	Clinical Trials
2	26BTU5DB	Bioethics and Biosafety
3	26BTU5DC	Molecular Signaling

Semester VI (Elective II)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	26BTU6DA	Drug Design and Delivery
2	26BTU6DB	Biomaterials
3	26BTU6DC	Synthetic Biology

Semester VI (Elective III)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	26BTU6DD	Biomarker Technology
2	26BTU6DE	Molecular Diagnostics
3	26BTU6DF	Food Technology

GENERIC ELECTIVE COURSES (GE)

The following are the courses offered under Generic Elective Course

Semester V (GE-I)

S. No.	Course Code	Course Name
1	26BTU5GA	Mushroom Technology

EXTRA CREDIT COURSES

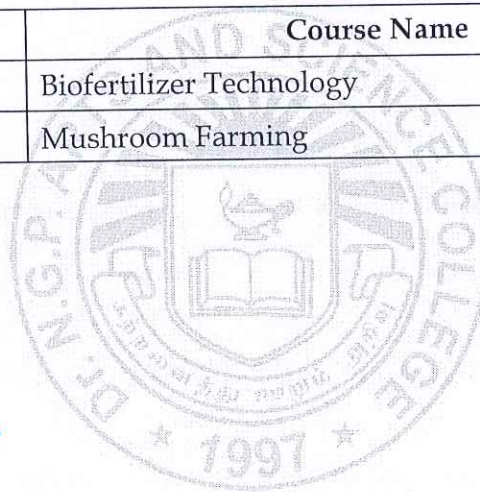
The following are the courses offered under self study to earn extra credits: Semester

III

S. No.	Course Code	Course Name
1	26BTU5SA	Biofertilizer Technology
2	26BTU5SB	Mushroom Farming



BoS Chairman/HoD
Department of Biotechnology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048



Semester - I
Core: CELL BIOLOGY

Semester	Course Code	Course Name	Category	L	T	P	Credits
I	26BTU1CA	CELL BIOLOGY	CORE	48	12	-	4

Preamble	This course has been designed for students to learn and understand • The basic components and functions of cell organelles • The cell signaling, cycle, progression and its regulation • The pathological progressions of a cell
-----------------	---

Prerequisite	Knowledge on Basic of Cell and Cell organelles
---------------------	--

Course Outcomes (COs)

CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Apply the concepts of cell architecture and composition to explain cellular organization.	K3
CO2	Analyze the membrane organization for nutrient uptake	K4
CO3	Assess the mode of transport relating to inter and intracellular mechanisms	K4
CO4	Evaluate signaling events within cells and their functional significance.	K5
CO5	Assess the accuracy and reliability of representations of cell cycle events and pathological progression, incorporating documentation, inspection, and certification standards.	K5

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	M
CO5	S	M	M	S	S

26BTU1CA

CORE: CELL BIOLOGY

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	History - cell theory – scope – types and shapes - organization of prokaryotic and eukaryotic cell and their differences. Cytoskeleton – microtubules. Nucleus, endoplasmic reticulum (rough and smooth), golgi apparatus, mitochondria, ribosomes, chromosome, chloroplast, lysosome, peroxisome.	13	Text Book
II	Cell membrane - structure and function, transport of nutrients and ions across the membranes. Diversity of plasma membranes (Trilamilar, bimolecular leaflet, lattice, micellar, fluid mosaic model). Desmosomes, plasmodesmata. Cell junctions – adherent, gap and tight junctions.	12	Reference Book
III	Membrane transport types. General classes of transport systems- uniport, symport, antiport. Diffusion- passive and facilitated. Active transport- primary and secondary. The P-type ATPases (Na ⁺ K ⁺ -ATPase), ion channels (ligand- gated and voltage-gated).	10	Reference Book
IV	Cell Signalling-Intercellular signaling & intracellular signaling- forms of cell signaling-types of receptors- Signalling molecules-Responses to the Signaling Pathway- Termination of Signaling Pathways.	12	Text Book
V	Cell cycle - Mitosis – meiosis and their significance. Cell Ageing – mechanism – theories (Free radical theory and somatic mutation theory). Cell death - necrosis, apoptosis. Difference between necrosis and apoptosis. Mechanism of apoptosis. Characteristics of cancer cell. Tumor cells - Stages of progression.	13	Text Book
	Total	60	

Text Book	1.	Rastogi SC, 2015, "Cell Biology", 3 rd edition, New Age International Publishers, India
Reference Books	1.	Islam A, 2011, "Text Book of Cell Biology", 2 nd edition, Books and Allied (P) Ltd. , India
	2.	De Roberties D, 2020, "Cell and Molecular Biology", 8 th edition, Wolters Kluwer _ New Delhi
	3.	Lodish H & Baltimore D, 2016, "Molecular Cell Biology", 8 th edition, W.H. Freeman & Company, New York, USA
	4.	Karp G, 2002, "Cell and Molecular Biology", 3 rd edition, John Wiley Sons. Inc, USA

Journal and Magazines	Journal of Cell Biology JCB
E-Resources and Website	physiology.org

Learning Methods	Power Point, Chalk and Talk
-------------------------	-----------------------------

Focus of the Course	Acquire Knowledge in Basics of Cells and Cell Organelles
----------------------------	--

Semester - I
Core: MICROBIOLOGY

Semester	Course Code	Course Name	Category	L	T	P	Credits
I	26BTU1CB	MICROBIOLOGY	CORE	48	12	-	3

Preamble	This course has been designed for students to learn and understand • Science of Microbiology and general techniques used • Beneficial and harmful activities of microorganisms to humans • Clinical Applications of microbiology	
Prerequisite	Knowledge on Basic Microbiology	
Course Outcomes (COs)		
CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Apply the fundamental concepts of microbiology to explain basic microbial principles.	K3
CO2	Analyze media preparation methods, sterilization techniques, microbial growth phases, and nutritional classification.	K4
CO3	Evaluate the structure, reproduction, and causative diseases of bacteria.	K5
CO4	Assess the structure, reproduction, and causative diseases of viruses.	K5
CO5	Validate comparative models depicting the structure, reproduction, and disease mechanisms of fungi.	K5

Mapping with Program Outcomes:

COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	M
CO2	S	M	S	S	S
CO3	M	M	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

26BTU1CB	CORE: MICROBIOLOGY
----------	--------------------

Syllabus

Unit	Content	Hours	E-Contents / Resources
I	History of Microbiology - Biogenesis Vs Abiogenesis, Contributions of Louis Pasteur, Robert Koch, Edward Jenner, Alexander Fleming. Microscopy – Bright field or Light, Dark Field, Phase contrast, Fluorescence; Electron Microscopy – Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM).	12	Text Book
II	Sterilization- Methods - Physical – Dry Heat, Moist Heat, Cold sterilization and Chemical sterilization. Preparation of Culture Media – types. Growth curve - Determination of Generation Time, Measurement of Growth – Viable count, Turbidometry and Direct Cell count. Nutritional classification of microbes.	12	Text Book
III	Classification (Bergy's manual) - Bacterial Structure, Reproduction of Bacteria. Diseases caused by <i>Mycobacterium tuberculosis</i> (Tuberculosis), <i>Salmonella typhi</i> (Typhoid), <i>Vibrio cholera</i> (Cholera), <i>Clostridium tetani</i> (Tetanus) and <i>Staphylococcus aureus</i> (Skin Infections), <i>Corynebacterium diphtheriae</i> (Diphtheria).	12	Reference Book
IV	Virus structure, Classification (Baltimore), Reproduction – Generalized and Specialized, Diseases caused by HIV (AIDS), Hepatitis B Virus (Jaundice), Varicella zoster (Chicken Pox), Polio myelitis (Polio), Viral gastroenteritis (stomach flu), Ebola and Corona virus 2019 (COVID-19)	12	Reference Book
V	Fungal structure - classification - reproduction. Diseases caused by <i>Tinea rubrum</i> (body ring worm), <i>Tinea pedis</i> (athlete's foot), <i>Candida</i> species (bronchitis), <i>Actinomyces israelii</i> (oral infection), <i>Aspergillus fumigatus</i> (sinus), Fungal Eye Infections - Keratitis, Endophthalmitis, Yeast infection (Vaginal), Jock itch (<i>Tinea cruris</i>).	12	Text Book
	Total	60	

Text Book	1.	Atlas M Ronald, 2015, "Principles of Microbiology", 2 nd Edition, McGraw- Hill Publication, India.
Reference Books	1.	Pelzar M, 2001, "Microbiology", 5 th Edition, McGraw Hill Education (India) Pvt Ltd, India.
	2.	Brij Mohan Meena, 2018, Microbiology, 1 st Edition, Paradise Publisher - Jaipur.
	3.	Gerard J T, 2012, "Microbiology: An Introduction", 11 th Edition, Benjamin Cummings Publishers, USA.
	4.	Joanne Willey, Kathleen Sandman, Dorothy Wood, 2020, "Prescott's Microbiology", 11 th Edition, McGraw Hill Education, New York.

Journal and Magazines	https://link.springer.com/journal/12088
E-Resources and Website	https://vlab.amrita.edu/?sub=3&brch=76

Learning Methods	Chalk and Talk/Assignment/Seminar
-------------------------	-----------------------------------

Focus of the Course	Skill Development/Employability
----------------------------	---------------------------------

Semester – I CORE PRACTICAL : CELL BIOLOGY AND MICROBIOLOGY							
Semester	Course Code	Course Name	Category	L	T	P	Credits
I	26BTU1CP	CELL BIOLOGY AND MICROBIOLOGY	CORE		-	48	2

Preamble	This course has been designed for students to learn and understand • Functions of Cells and its types • Methods of Microbial isolation • Various types of staining techniques
Prerequisite	Basic Knowledge of cells and microbes

Course Outcomes (Cos)		
CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Prepare Solutions and Buffers	K3
CO2	Observe various plant parts under microscope	K3
CO3	Analyze pure microbial cultures	K4
CO4	Perform different microbial staining and observation	K4
CO5	Identify Bacterial growth and antibiotic sensitivity	K4

Mapping with Program Outcomes:					
Cos / POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	S
CO2	S	S	M	M	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

26BTU1CP	CORE PRACTICAL: CELL BIOLOGY AND MICROBIOLOGY
----------	---

S.No

List of Practicals

- 1 Calculations of Molarity, Normality and Percentage Solution.
- 2 Microscopic observation of Monocot and Dicot Leaf, Root and Stem section.
- 3 Staining of plant cells - Onion epidermal cells.
- 4 Staining of starch granules.
- 5 Mitotic preparation from onion root tip.
- 6 Enumeration of microorganism from soil by serial dilution method and Pure Culture Techniques.
- 7 Staining of Bacteria– Simple, Negative and Gram staining.
- 8 Staining of Fungi.
- 9 Observation of fungi under stereomicroscope*.
- 10 Bacterial growth curve by turbidimetry method.
- 11 Antibiotic sensitivity test - Kirby Bauer Method.
- 12 Methylene Blue Reduction test.

* DBT STAR Experiments

Text Books	1.	Becker JM, Caldwell GA and Zachgo A, 2007, "Biotechnology– A laboratory Course", 2 nd Edition, Academic Press, USA
	2.	Davey J and Lord M, 2003, "Essential Cell Biology Volume 1: Practical Approach", 1 st Edition, OUP Oxford, UK.

Learning Method	Demonstration/ Hands on Experiments
Focus of the Course	Skill Development/ Employability

Semester – I IDC I: CHEMISTRY							
Semester	Course Code	Course Name	Category	L	T	P	Credits
I	26CEU11B	CHEMISTRY	IDC	48	-	-	4

Preamble	This course has been designed for students to learn and understand • The concept of expressing concentration of solutions • The concepts of chemical kinetics and catalysis • The bonding in molecules.
Prerequisite	Knowledge on basic Chemistry

Course Outcomes (Cos)		
CO Number	Course Outcomes (COs) Statement	Bloom's Taxonomy Knowledge Level
CO1	Understand the concept of concentration of the solutions.	K2
CO2	Infer the acid and basic properties of solutions.	K3
CO3	Interpret the concept of the bonding in molecules.	K3
CO4	Summarize the basic concepts of the stereo chemistry.	K4
CO5	Evaluate the chemical kinetics and catalysis.	K5

Mapping with Program Outcomes:					
Cos / POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	S	S	S	S	S
CO3	M	M	S	S	M
CO4	S	S	M	S	S
CO5	S	S	S	M	S

26CEU1IB	CHEMISTRY
----------	-----------

Syllabus

Unit	Content	Hrs	Resources
I	Solutions Normality, molarity, molality, mole fraction, mole concept. Primary and secondary standards – Preparation of standard solutions. Principle of volumetric analysis (Acid base titrations). Indicators – Theory of indicators - Ostwald and quinonoid theory.	10	Text Book
II	Acids and Bases Acid-base concepts: Arrhenius, Brønsted–Lowry and Lewis theories (basic understanding) - strong, weak acids and bases in biological systems - pH and pOH- definition, biological importance- pKa and pKb: meaning and relation to acid/base strength (basic interpretation only) - Buffer solutions: definition, types, and importance in biological systems (blood, cells. pH, pKa, pKb and pOH simple calculations.	8	Text Book
III	Chemical Bonding Types of bonding - Ionic Bond: formation, nature, and importance in salts and biological fluids - Covalent bond: formation and significance in biomolecules like carbohydrates, proteins and lipids - Coordinate (dative) bond: basic concept and role in biological complexes (e.g., metal-enzyme interactions) - Hydrogen bonding: DNA stability – Van der Waals force.	10	Text Book
IV	Stereo Chemistry Isomerism - Structural isomerism - Symmetry of elements (Plane, Centre and Axis of symmetry) - Optical isomerism of lactic acid and tartaric acid – Enantiomers - Diastereomers – Separation of racemic mixture - Geometrical isomerism (maleic and fumaric acid). R/S and E/Z configuration assignments for simple molecules.	10	Text Book
V	Chemical Kinetics and Catalysis Rate of reaction - Rate law – Order – Molecularity - First order rate equation - half-life period - pseudo first order reaction. Catalysis – Homogenous – Heterogeneous - Enzyme catalysis - Industrial catalyst - hydrogenation of oils - Applications in food industry and pollution control.	10	Text Book
Total		48	

Text book	1.	Puri. B.R, Sharma. L.R and Pathania. M.S, 2017, "Principles of Physical Chemistry", 47 th Edition, John Wiley and Sons & USA.
	2.	Madhan. R.D, 2016, "Modern Inorganic Chemistry", 10 th edition, Mc Graw Hill Company & USA.

Reference Books	1.	Lee. J.D, 2002, "A New Concise Inorganic Chemistry", 5 th Edition, ELBS &UK.
	2.	Jain. M.K and Sharma. S.C, 2012, "Modern Organic Chemistry", Vishal publishing Co & New Delhi.
	3.	Puri. B.R, Sharma. L.R and Kalia. K.C, 2016, "Principles of Inorganic Chemistry", Vishal Publishing & Co & New Delhi.
	4.	Glasstone. S and Lewis. D, 2014, "Elements of Physical Chemistry", Second Edition, Macmillan Ltd, London.

Journal and Magazines	https://onlinelibrary.wiley.com/journal/10974601
E-Resources and Website	https://tech.chemistrydocs.com/Books/Organic/Stereochemistry-of-Organic-Compounds-by-D-Nasipuri-Second-Edition.pdf

Learning Method	Chalk and Talk/Assignment/Seminar/ Group Discussion/Case Study
------------------------	--

Focus of the Course	Skill Development/ Employability/ Entrepreneurial Development/ Innovations
----------------------------	--


BoS Chairman/HoD
Department of Biotechnology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

 Dr.N.G.P. Arts and Science College		
APPROVED		
BoS- 2,5 ⁺ 02/04/26	AC -	GB -