



SACRED HEART COLLEGE (AUTONOMOUS)

Tirupattur – 635 601, Tamil Nadu, S.India

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Ready for
Every Good Work

A Don Bosco Institution of Higher Education, Founded in 1951 * Affiliated to Thiruvalluvar University, Vellore * Autonomous since 1987

Accredited by NAAC (4th Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

Sacred Heart College (Autonomous), Tirupattur District

1.2.1 List of New Courses

B.Sc. BIOCHEMISTRY

Sem	Sub Code	Title of the Subject	Cont act Hrs	Credit	E-Hrs	CA	SE	Total
	LT 112	Tamil	5	3	-	-	-	-
I SE ME ST ER	LE 114T	General English	5	3	-	-	-	-
	CE 102	Communicative English		1*				
	BC 104	Cell Biology	3	3	3	30	70	100
	BC 105	Biomolecules	4	4	3	30	70	100
	PBC 101	Main practical I	3	3	3	40	60	100
	ACH 109B	Allied Chemistry I	6	4	-	-	-	-
	SK 103	Personal Skills	2	1	-	-	-	-
	VE104A/B	Ethics	2	1	-	-	-	-
	TOTAL		30	22+1*				
	LT 212	Tamil	5	3	3	30	70	100
	LE 214AT	General English	5	3	3	30	70	100
	CE 202	Communicative English		1*				

II SE ME ST ER	BC 204	Plant Physiology	3	3	3	30	70	100
	BC 205	Human physiology	4	4	3	30	70	100
	PBC 204	Main practical II	3	3	3	40	60	100
	ACH 209B	Allied Chemistry II	6	4	-	-	-	-
	SK 203	Social skills	2	1	-	-	-	-
	VE204A/B	Ethics	2	1	-	-	-	-
TOTAL			30	22+1*	-	-	-	-

Sem	Code	Title of the Subject	Contact Hrs	Credit	E-Hrs	CA	SE	Total
III SE ME ST ER	LT 311	Tamil	5	3	3	30	70	100
	LE 308T	General English	5	3	3	30	70	100
	BC 304	Microbiology	3	3	3	30	70	100
	BC305	Biophysical chemistry	4	4	3	30	70	100
	PBC301	Main practical III	3	3	3	40	60	100
	AM 309C	BIOSTATISTICS	6	4	-	-	-	-
	SK 303	Employability Skills I	2	1	-	-	-	-
	VE 305	Human Rights	2	1	3	30	70	100
		DEEDS	-	-	-	-	-	-
	SHELTERS	-	-	-	-	-	-	
TOTAL			30	22	-	-	-	-
IV SE ME ST	LT 410	Tamil	5	3	3	30	70	100
	LE 408T	General English	5	3	3	30	70	100
	BC404	Applied Microbiology	3	3	3	30	70	100
	BC 405	Analytical Biochemistry	4	4	3	30	70	100
	PBC404	Main practical IV	3	3	3	40	60	100
	AM 408C	BIOSTATISTICS	6	4	3	30	70	100

ER	SK 403	Employability Skills I	2	1	-	-	-	-
	VE 405	EVS	2	1	3	30	70	100
		DEEDS	-	2	-	-	-	-
		SHELTERS	-	2	-	-	-	-
		Summer Lab Training		2*	-	-	-	-
	TOTAL		30	26+2*				
V	BC 516	Enzymology	4	4	3	30	70	100
	BC 517	Intermediary metabolism	5	5	3	30	70	100
	BC 518	Endocrinology	4	4	3	30	70	100
	BC 519	Genetics	4	4	3	30	70	100
	PBC 501	Main practical V	5	4	6	40	60	100
	BC 520	<ul style="list-style-type: none"> • Biomedical Instrumentation • Medical laboratory technique • Pharmacology (one out of three)						
	A							
V	BC 520B		6	4	3	30	70	100
SE								
ME ST	BC 520C							
	SSP	Health Management	-	1*	-	-	-	-
ER								
	NBC 503	NME –Energy Builders	2	1	3	30	70	100
	TOTAL		30	26 + 1*	-	-	-	-
VI	BC 613	Molecular Biology	5	5	3	30	70	100
	BC 614	Immunology	4	4	3	30	70	100
	BC 615	Medical Biochemistry	4	4	3	30	70	100
	PBC 605	Main practical VI	5	4	6	40	60	100

SE ME ST ER	BC 616	Biotechnology	5	5	3	30	70	100
	BC 617	Bioethics	5	5	3	30	70	100
	SSP	Nutritional Biochemistry	-	1*	-	-	-	-
	NBC 603	NME – Health care and Disease management	2	1	3	30	70	100
	TOTAL		30	28 + 1*	-	-	-	-

**Sacred Heart College (Autonomous),
Tirupattur District**

1.2.1 List of New Courses

Department: B.Sc. Biochemistry

S.No	Course Code	Course Name
1.	BC305	Biophysical chemistry
2.	PBC301	Main practical III
3.	BC404	Applied Microbiology
4.	PBC404	Main practical IV

**BIOPHYSICAL
CHEMISTRY - BC305**

Objective:

To understand about basic biophysical units and its chemistry.

4 Hrs**3 Credits****Course outcome**

On completion of this subject, a student will be able to understand the range of physical methods used to characterize the organization, properties and function of biological molecules, along with the necessitating sophisticated methods to study them at the molecular level. This course will be also providing the principle, instrumentation and application of various basic and sophisticated analytical instruments like Electrophoresis, Microscopy, Chromatography, and Spectroscopy.

UNIT- I: Units of measurement of solutes in solution, normality, molality, molarity, and milliosmol examples for this concept. Ionic strength, Isotonic, hypertonic and hypotonic solution. Osmosis and its applications.

UNIT-II: Acid and bases, Arrhenius, Lowry & Bronsted concept, Lewis concept – conjugated pairs. pH, pOH, buffer, buffering capacity, common ion effect. Henderson Hesselbalch equation. Buffers in body fluids.

UNIT – III: Principles of electrochemical techniques, Reference electrodes – Silver and Calomel electrode. Determination of pH using indicators, Hydrogen electrode and glass electrodes.

UNIT-IV: Work, heat, free energy, enthalpy and entropy, Reversible & irreversible process, isothermal and adiabatic process, Hess's law and its applications, Kirchhoff's equation, First law of thermodynamics, relations between C_p & C_v .

UNIT- V: Definition of viscosity coefficient. Poiseuille's equation, Stoke's law and terminal velocity. Determination of viscosity coefficient of liquids. (b) Surface tension: Definition, determination of surface tension, temperature effect. (c) Preliminary idea of Chemical equilibrium: Equilibrium constant, Le Chatelier's principle and its simple applications.

Text Books:

1. P Asokan (2001)., Analytical Biochemistry., Chinna Publications, Melvisharam.
2. K.Wilson and J. Walker (2006), Practical Biochemistry – Principles and techniques of Biochemistry and Molecular Biology, sixth Edition, Cambridge University Press, New York, USA.

References

A. Upadhyay, K. Upadhyay and N. Nath (2007), Biophysical chemistry, Third revised edition, Himalaya publishing House, Mumbai.

1. Vasantha Pattabhi and Gautham, (2002), Biophysics, second reprint 2005. Narosa Publishing House PVT Ltd, New Delhi.
2. R. Gurdeep, Chatwal and Sham K. Aanand. (2006). Instrumental Methods of Chemical Analysis, Himalaya publishing House, New Delhi.
3. David Freifelder (1976)., Physical biochemistry, applications to biochemistry and molecular biology, second edition. W.H. Freeman & Co Ltd.
4. M.L Srivastava (2008)., Bioanalytical Techniques., Narosa, Chennai

Main Practical-III - PBC301

3 Hrs

3 Credits

I. PREPARATION

a) Preparation of Buffer

- Phosphate buffer
- Tris buffer
- Citrate buffer.

b) Reagents preparation

- Normality and Molarity solution
- Saturated solution, Percentage solution, Sucrose gradient solution and dilute solution.

II. TECHNIQUE

Colorimetry

- a. Estimation of amino acids by Ninhydrin method.
- b. Estimate the protein by Biuret and Lowry's method and compare the 2 methods sensitivity.

Semester – IV

MICROBIOLOGY - BC404

3Hr

s3

Credits

Objective

:

To understand about mode of microbial infections, fermentation and waste management.

Course outcome

By learning this subject, Students can demonstrate knowledge of microbial cell structure and metabolism, evolutionary forces and their consequences. It obtains wide knowledge as how microorganisms interact with their environment and interaction between humans. Students can describe and use new and existing methods and technologies in and out of the laboratory setting. They can also formally communicate the results of biological investigations using both oral and written. Students can demonstrate an understanding, and ability to use, the scientific method including observation, hypotheses testing, data collection, analysis and interpretation.

UNIT – I: Principles of food preservation; Single cell proteins – *Spirulina*; Fermented dairy products – Cheese and Yoghurt; Baker's yeast – Bread making, Beer and Wine production; Food borne infection and intoxication.

UNIT – II: Microbial infections; Bacterial diseases – Typhoid, Anthrax, Tuberculosis and Leprosy; Fungal diseases - Candidiasis, Aspergillosis and Dermatophytes; Viral diseases - AIDS, Rabies, Hepatitis and Small Pox.

UNIT – III: Microbial fermentation and Fermentor; Microbial products of industrial value – Penicillin, Streptomycin, Ethanol, Amylase, Vitamin – B12 and Glutamic acid.

UNIT – IV: Wastes - Types of wastes; Solid waste treatment – Saccharification, Gasification and Composting; Liquid waste treatment – Aerobic and Anaerobic methods; Bioremediation and Biodeterioration of wastes.

UNIT – V: Plant – Microbe Interaction; Introduction to Bioinoculants (Biofertilizer and Biopesticides); Different formulations of Bioinoculants, Quality control of different Bioinoculants; Composting and Vermicomposting.

Text Books:

1. M.J. Pelczar Jr, E.C.S. Chan and N.R. Kreig (2006). "Microbiology"- 5th Edition Mc Graw HillInc. New York.
2. Ahamed N, (2016), Four-R's-Manual for biological waste management, Saliha Publications.

References

1. R. Ananthanarayan and C.K. Jayaram Paniker (2000). Text book of Microbiology. 6th Edition, Orient Longman Limited, Chennai.
2. R.M. Atlas and R. Bartha (1992). Microbial ecology. Fundamentals and applications. 3rd Edition. Red Wood City. C.A. Benjamin
3. W.C. Frazies and D.C. Westhoff (1988). Food microbiology. 4th Edition. McGraw Hill NY.
4. U. Satyanarayana (2005). Biotechnology. 1st Edition, Books and Allied (P) Ltd., Kolkata.
5. N.S. SubbaRao (1995) Soil microorganisms and plant growth Oxford and IBH publishing co. Pvt.Ltd. NewDelhi.
6. M.J. Waites (2007). Industrial Microbiology. Blackwell Publishing Company. UK.

Main Practical-IV - PBC404

3 Hrs 3Credits

I Electrophoresis

- a. Separation of serum protein by SDS-PAGE and Agarose.

II Chromatography

- a. Paper chromatographic separation and detection of amino acids
- b. Preparation of TLC plate
- c. Separation of carbohydrates and amino acids compounds by TLC

III Microbiology

- i. Preparation of liquid and solid media for growth of microorganisms.
- ii. Isolation of bacteria and fungi from Air, soil and water
- iii. Isolation and maintenance of organisms by plating and streaking methods. Slants and swabculture.
- iv. Antibiotic sensitivity test
- v. Microscopic examination of organisms by gram stain method