St. PETER'S UNIVERSITY

St. Peter's Institute of Higher Education and Research
(Declared Under Section 3 of the UGC Act, 1956)
AVADI, CHENNAI – 600 054
TAMIL NADU

B.Sc. (BIOCHEMISTRY)
Code No. - 315

(Effective From **2009 – 2010**)
(Distance Education)

Regulations and Syllabi

(I Year)

St. PETER'S INSTITUTE OF DISTANCE EDUCATION
Recognized by Distance Education Council and
Joint Committee of UGC – AICTE - DEC, New Delhi
(Ref. F. No. DEC/SPU/CHN/TN/Recog/09/14 dated 02.04.2009 and Ref.F.No.DEC/Recog/2009/3169 dated 09.09.2009)

St. PETER'S UNIVERSITY
St. PETER'S INSTITUTE OF DISTANCE EDUCATION
Chennai – 600 054.

Code No. – 315
B.Sc. (BIOCHEMISTRY)
(Distance Education)

Regulations and Syllabi
(Effective from 2009 – 2010)

1. **Eligibility:** Candidates who have passed the Higher Secondary Examination conducted by the Government of Tamilnadu with Maths, physics and chemistry as one of the subjects, or any other examination recognized as equivalent thereto are eligible for admission to Three Year B.Sc. Programme in Biochemistry.

2. **Duration:** Three Years.

3. **Medium:** English is the medium of instruction and examination.

4. **Methodology:** The methodology of distance education includes supply of self-instructional study materials in print format and in CD, face-to-face instruction for theory and practicals for a limited period during week ends and on holidays, provision of virtual class in phased manner, dissemination of information over e-mail, Student - Support Service at various Centres of the University, Continuous Assessment and End Assessment conducted by the University at various parts of India.

5. **Weightage for Continuous and End Assessment:** There is no weightage for Continuous Assessment unless the ratio is specifically mentioned in the scheme of Examinations. The End Assessment (EA) has 100% weightage.

6. **Credit System:** Credit system be followed with 36 credits for each Year and each credit is equivalent to 25 hours of effective study provided in the Time Table of the formal system.

7. **Scheme of Examinations**

First Year

Code No.	Course Title	Credit	Marks	
Theory			**EA**	**Total**
109UTMT01 109UHIT01	Tamil - I Hindi - I	6	100	100
109UEHT02	English - I	6	100	100
109UBYT03	Basic Principles of Biochemistry	8	100	100
109UBYT04	Basic Principles of Microbiology	8	100	100
109UBYP01	Practical – (Main – I) Record	8	90 10	100
	Total	**36**	**500**	**500**

8. **Passing Requirements:** The minimum pass mark (raw score) be 40% in End Assessment.

9. **Grading System:** Grading System on a 10 Point Scale be followed with 1 mark = 0.1 and the conversion of the Grade point as given below.

$$\text{Overall Grade Point Average (OGPA)} = \frac{\text{Sum of Weighted Grade Points}}{\text{Total Credits}}$$

$$= \frac{\Sigma (EA)C}{\Sigma C}$$

The Overall Grade: The Overall Grade and Classification of all successful candidates be arrived at from the Overall Grade Point Average as stipulated in the following conversion Table.

Grade	Over all Grade Point Average(OGPA)	Over all weighted Average marks	Classification
0	9.0 to 10.0	90 to 100	First Class
A	8.0 to 8.9	80 to 89	First Class
B	7.0 to 7.9	70 to 79	First Class
C	6.0 to 6.9	60 to 69	First Class
D	5.0 to 5.9	50 to 59	Second Class
E	4.0 to 4.9	40 to 49	Third Class
F	0.0 to 3.9	0 to 39	**Reappearance**

The Grade Sheets of successful candidates provide particulars such as (1) Overall weighted Average Marks and (2) Overall Grade.

10. Pattern of the Question Paper: The question paper for the End Assessment will be set for three hours and for a maximum of 100 marks with following divisions and details.

Part A: 10 questions (with equal distribution to all units in the syllabus). Each question carries 2 marks.

Part B: 5 questions with either or type (with equal distribution to all the units in the syllabus). Each question carries 16 marks.

The total marks scored by the candidates will be reduced to the maximum prescribed in the Regulations.

11. Syllabus

109UBYT03: BASIC PRINCIPLES OF BIOCHEMISTRY

UNIT – 01

DEFINITION - CHEMICAL AND PHYSICAL CHARACTERISTICS - CLASSIFICATION OPTICAL ISOMERISM - PROPERTIES - PREPARATION OF GLUCOSE AND FRUCTOSE – INTER CONVERSION STRUCTURAL ELUCIDATION OF GLUCOSE - FRUCTOSE - SUCROSE.

UNIT – 02

INTER CONVERSION STRUCTURAL EDUCATION OF LACTOSE - MALTOSE - CELLULOSE - POLYSACCHARIDES - CHONDROITIN SULPHATES.

UNIT – 03

OCCURRENCE - BIOLOGICAL IMPORTANCE OF LIPIDS - CLASSIFICATION OF LIPIDS - COMPOUND LIPIDS AND THEIR CLASSIFICATION - LECITHIN - SPINGOMYELIN.

UNIT – 04

PLASMOLEGENS - GANGLIOSIDES - CEREBROSIDES - DERIVED LIPIDS.

UNIT - 05

COMPOSITION OF AMINO ACIDS - D AND L AMINO ACIDS - CLASSIFICATION OF AMINO ACIDS

UNIT - 06

CHEMICAL PROPERTIES OF AMINO ACIDS - PHYSICAL PROPERTIES OF AMINO ACIDS.

UNIT - 07

COMPOSITION OF NUCLEOSIDES - NUCLEOTIDES - ISOLATION AND SEPARATION OF NUCLEIC ACIDS - PRIMARY STRUCTURES - SECONDARY STRUCTURES - DENATURATION.

UNIT - 08

STRUCTURE OF RNA - NUCLEASES - ESTIMATION OF RNA AND DNA - PROTEIN – INSULIN - GLUTATHIONE.

UNIT – 09

CLASSIFICATION OF PROTEINS - CLASSIFICATION OF BASED OF COMPOSITION ANDSOLUBILITY - CONJUGATED PROTEIN - DERIVED PROTEINS - CHEMICAL PROPERTIES OF PROTEINS AND PEPTIDES - CLASSIFICATION OF PEPTIDES - CLASSIFICATION OF PEPTIDES - DETERMINATION OF AMINO ACIDS - DENATURATION OF PROTEINS - SYNTHESIS OF PEPTIDES - ESTIMATION OF PROTEIN - PAPER CHROMATOGRAPHY.

UNIT – 10

LAW OF MASS ACTION AND EQUILIBRIUM CONSTANT - TYPES OF CHEMICAL EQUILIBRIUM - LE CHATLIERS PRINCIPLE - EFFECT OF CHANGES IN CONCENTRATION - PRESSURE - TEMPERATURE - HYDROGEN IODIDE EQUILIBRIUM - DISSOCIATION OF N2O4 - APPLICATION OF LAW OF MASS ACTION TO PCL5 SYSTEM - DIPOLES - HYDROGEN BOND - PROPERTIES OF WATER - FORMATION OF AMMONIA - HETEROGENOUS EQUILIBRIA - BIOLOGICAL APPLICATION OF VAPOUR PRESSURE.

UNIT – 11

CAROTENOIDS - TERPENES - PURINES AND PYRIMIDINES - PYRIDINE - HEME - QUINOLINE - PTERIDINE - INDOLE - PYRROLE - THIAZOLE - IMIDAZOLE.

UNIT – 12

CLASSIFICATION OF VITAMINS - FAT SOLUBLE VITAMINS - VITAMIN A - VITAMIN D - VITAMIN E - VITAMIN K - WATER SOLUBLE VITAMINS - VITAMIN B - VITAMIN C.

109UBYT04: BASIC PRINCIPLES OF MICROBIOLOGY

UNIT – 01

MICROORGANISMS - DEFINITION - SCOPE - HISTORY - TAXONOMY AND CLASSIFICATION OF MICROORGANISMS - NOMENCLATURE OF MICROBES INCLUDING BACTERIA - VIRUS - FUNGI - PROTOZOA AND ALGAE..

UNIT – 02

MICROSCOPY - INTRODUCTION - DEFINITION - CLASSIFICATION - METHODS OF MICROSCOPY - LIGHT MICROSCOPE - COMPOUND MICROSCOPE - PHASE CONTRAST MICROSCOPE - FLUORESCENT MICROSCOPE - ELECTRON MICROSCOPE AND THEIR APPLICATIONS.

UNIT – 03

STAINING - INTRODUCTION - DEFINITION -CLASSIFICATION - STAINS AND STAINING PROCEDURE - TYPES OF STAINING - SIMPLE - DIFFERENTIAL AND SPECIAL STAINING - METHYLENE BLUE - GRAM STAINING - ACID FAST - CAPSULAR STAINING – LACTO PHENOL COTTON BLUE STAINING - ANTISEPTICS - ANTIBIOTIC SENSITIVITY TEST.

UNIT – 04

STERILIZATION AND DISINFECTION - INTRODUCTION - DEFINITION - TYPES OF AGENTS - PHYSICAL AGENTS - SUNLIGHT - DRYING - DRY HEAT - MOIST HEAT - FILTRATION - RADIATION - ULTRASONIC AND SONIC VIBRATIONS - CHEMICAL AGENTS - ALCOHOLS - ALDEHYDES - DYES - HALOGENS - PHENOLS - SURFACE ACTIVE AGENTS - METALLIC SALTS - GASES.

UNIT – 05

ANTIMICROBIAL CHEMOTHERAPY - ANTIBIOTICS - SOURCE AND MODE OF ACTION – DRY RESISTANCE - GENETIC MECHANISMS OF DRUG RESISTANCE IN BACTERIA.

UNIT – 06

MICROBIAL NUTRIENTS - MICRO AND MACRO NUTRIENTS - NUTRITIONAL GROUPS - MEDIA PREPARATION - INTRODUCTION - TYPES OF MEDIA - SOLID MEDIA - LIQUID MEDIA & SEMI SOLID MEDIA - SIMPLE MEDIA - AEROBIC & ANAEROBIC MEDIA.

UNIT – 07

CULTURE TECHNIQUES - PRESERVATION AND MAINTENANCE OF CULTURE - AEROBIC - ANAEROBIC - PURE AND MIXED CULTURES - BATCH CULTURE - CONTINUOUS CULTURE AND SYNCHRONOUS CULTURE - FACTORS AND THEIR SIGNIFICANCE.

UNIT – 08

INSTRUMENTS - PRINCIPLES - OPERATION AND MAINTAINS - TYPES - AUTOCLAVE – HOT AIR OVEN - INCUBATOR - CENTRIFUGE - ELECTROPHORESIS - CHROMATOGRAPH - WATER BATH - REFRIGERATOR - DEEP FREEZERS AND LAMINAR AIR FLOW.

UNIT – 09

AUTOTROPHIC CARBON DIOXIDE FIXATION AND MECHANISMS OF PHOTOSYNTHESIS - HYDROGEN BACTERIA - NITRIFYING BACTERIA - SULFUR BACTERIA - IRON BACTERIA.

UNIT – 10

PHOTOSYNTHESIS - DEFINITION - OXYGENIC CATABOLISM OF GLUCOSE – EMP PATHWAY - PENTOSE PHOSPHATE PATHWAY - TCA CYCLE - ETS AND ATP PRODUCTION ANAEROBIC RESPIRATION AND FERMENTATION - YEAST FERMENTATION - LACTIC ACID BACTERIA.

UNIT – 11

MICROORGANISMS AND INDUSTRY - FERMENTATION - BATCH - CONTINUOUS – CULTURE - PRESERVATION - PRODUCTION OF ALCOHOL - BEER - WINE - VINEGAR - CITRIC ACID - ANTIBIOTICS AMINO ACIDS AND ENZYMES.

UNIT – 12

MICROBIAL AGENTS OF DISEASE - INTRODUCTION - TYPES OF AGENTS - BACTERIAL - VIRUSES - FUNGI AND PROTOZOA.

109UBYP01: MAIN PRACTICAL I

UNIT - 01

1. ESTIMATION OF SUGARS.
2. GALACTOSE - PENTOSE - MALTOSE - LACTOSE - STARCH.
3. ESTIMATION OF GLYCOGEN - DEXTRIN.
4. ANALYSIS OF PROTEIN - AMINO ACIDS - TYROSIN - TRYPTOPHAN - METHEONINE - ARGININE - CYSTENE.
5. TEST FOR CHOLESTEROL.
6. ESTIMATION OF ASCORBIC ACID - BY TITRIMETRIC - METHOD - USING - Z.6 - PHENOL - INDOPHENOL - DICHLOROPHENOL.
7. ESTIMATION OF SUGAR BY BENEDICTS - TITRIMETRIC METHOD.
8. ESTIMATION OF AMMONIA METHOD - URINE AND WATER.
9. DETERMINATION OF ACID NUMBER OF EDIBLE OIL.
10. SAPONIFICATION OF EDIBLE OIL.
11. SEPARATION OF SUGAR - AMINO ACIDS BY PAPER CHROMATOGRAPHY.
12. SEPARATION OF SERUM - PROTEINS BY ELECTROPHORESIS.