KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)

	KADI SARVA VISHWAVIDYALYA					
	B.SC CHEMISTRY SEMESTER - 4 SCHEME					
Subject Code	**Course**	**Instructions Hrs / week**	**Examination**			**Credit**
			Internal	**University Exam**	**Total**	
CCH-401	Inorganic Chemistry – I	3	30	70	100	3
CCH-402	Analytical Chemistry – I	3	30	70	100	3
CPH-401	Basic Physics – III	3	30	70	100	3
CPH-402	Basic Physics – IV	3	30	70	100	3
FCG-401	(University Elective) Basic English – IV	2	15	35	50	2
EGC-401	(Generic Elective - Institute elective) Social Service Scheme - II	2	50	00	50	2
SE CH 401-A	(Discipline Specific Specialization) Chemistry of Dyes & Pigments	2	50	00	50	2
SE CH 401-B	(Discipline Specific Specialization) Chemistry and Technology of Polymers					
SE CH 401-C	(Discipline Specific Specialization) Medicinal Chemistry-II					
PCH-401	Chemistry Practical – IV	6	0	100	100	3
PPH-401	Physics Practical – IV	6	0	100	100	3
	Total	**30**	**235**	**515**	**750**	**24**

	KADI SARVA VISHWAVIDYALYA					
	B.SC MICROBIOLOGY SEMESTER - 4 SCHEME					
Subject Code	**Course**	**Instructions Hrs / week**	**Examination**			**Credit**
			Internal	**University Exam**	**Total**	
CMB-401	Microbial Metabolism	3	30	70	100	3
CMB-402	Medical Microbiology	3	30	70	100	3
CCH-401	Inorganic Chemistry - I	3	30	70	100	3
CCH-402	Analytical Chemistry - I	3	30	70	100	3
FCG-401	(University Elective) Basic English – IV	2	15	35	50	2
EGC-401	(Generic Elective - Institute elective) Social Service Scheme - II	2	50	00	50	2
SE MB 401-A	(Discipline Specific Specialization) Food Microbiology II	2	50	00	50	2
SE MB 401-B	(Discipline Specific Specialization) Pathology –II					
PCH-401	Chemistry Practical – IV	6	0	100	100	3
PMB-401	Microbiology Practical - IV	6	0	100	100	3
Total		**30**	**235**	**515**	**750**	**24**

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)

	KADI SARVA VISHWAVIDYALYA					
	B.SC MATHEMATICS SEMESTER - 4 SCHEME					
Subject Code	**Course**	**Instructions Hrs / week**	**Examination**			**Credit**
			Internal	**University Exam**	**Total**	
CMAT-401	Advanced Calculus	3	30	70	100	3
CMAT-402	Advanced Linear Algebra	3	30	70	100	3
CPH-401	Basic Physics – III	3	30	70	100	3
CPH-402	Basic Physics – IV	3	30	70	100	3
FCG-401	(University Elective) Basic English – IV	2	15	35	50	2
EGC-401	(Generic Elective - Institute elective) Social Service Scheme - II	2	50	00	50	2
SE Math 401-A	(Discipline Specific Specialization) Business Mathematics – II	2	50	00	50	2
SE Math 401-B	(Discipline Specific Specialization) Discrete Mathematics - II					
PPH-401	Physics Practical – IV	6	0	100	100	3
PMAT-401	Mathematics Practical - II	6	0	100	100	3
Total		**30**	**235**	**515**	**750**	**24**

	KADI SARVA VISHWAVIDYALYA					
	B.SC PHYSICS SEMESTER - 4 SCHEME					
Subject Code	**Course**	**Instructions Hrs / week**	**Examination**			**Credit**
			Internal	**University Exam**	**Total**	
CPH-401	Basic Physics – III	3	30	70	100	3
CPH-402	Basic Physics – IV	3	30	70	100	3
CMAT-401	Advanced Calculus	3	30	70	100	3
CMAT-402	Advanced Linear Algebra	3	30	70	100	3
FCG-401	(University Elective) Basic English – IV	2	15	35	50	2
EGC-401	(Generic Elective - Institute elective) Social Service Scheme - II	2	50	00	50	2
SE PH 401-A	(Discipline Specific Specialization) Engineering Physics- II	2	50	00	50	2
SE PH 401-B	(Discipline Specific Specialization) Applied Physics-II					
PPH-401	Physics Practical – IV	6	0	100	100	3
PMAT-401	Mathematics Practical - II	6	0	100	100	3
Total		**30**	**235**	**515**	**750**	**24**

CCH-401 INORGANIC CHEMISTRY - I

RATIONALE: This course is designed to enable students to acquire basic understanding of inorganic chemistry

LEARNING OUTCOMES:

- Understand the concept of crystal field theory.
- Develop an understanding of chemistry of noble gases
- Gain knowledge about the non aqueous solvents and their reactions.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH-401	Inorganic Chemistry	3	48	30	70	100

COURSE CONTENT:

Unit 1: Coordination Compounds **No of lectures: 16 Weightage:33.4%**

- Crystal Field Theory
- Orientation of d-orbitals and Crystal Field Splitting of Energy levels
- Crystal Field Splitting in Octahedral complexes
- Crystal Field Stabilization Energy (CFSE)
- Crystal Field Splitting in Tetrahedral Complexes
- Crystal Field Splitting in Tetragonal and square Planar Complexes
- Isomerism in complexes.
- Magnetic Properties of Metal Complexes and Crystal Field Theory
- Factors influences the magnitude of Crystal Field Splitting
- Color of Transition Metal Complexes
- Crystal Field Effects on Ionic Radii
- Crystal Field Effects on Lattice Energies

Unit 2: Chemistry of Noble Gases **No of lectures: 16 Weightage:33.3%**

- Introduction
- Discovery of Noble gases: Occurrence, Isolation of Non-radioactive of Noble gases
- Electronic configuration of Noble gases
- Compound of Noble gases
- Non real compounds prepared by different methods
- True compounds: XeF_2, XeF_4, XeF_6, $XeOF_2$, XeO_3, XeO_2F_2, XeO_4, $XeOF_4$.

Unit 3: Non Aqueous Solvents No of lectures: 16 Weightage:33.3 %

- Introduction; Classification of Solvents; General Properties of Ionising Solvents
- Liquid Ammonia (NH_3): Physical Properties, Auto-ionization
- Acid-Base reactions, Ammonia as a proton –acceptor,
- Precipitation reactions, Complex formation reaction, Ammonolysis reactions,
- Reactions of Metal-Ammonia solution, Reduction –Oxidation (Redox) reactions; Advantages and disadvantages of using liquid Ammonia as a solvent.
- Liquid SO_2: Physical Properties, solubility of Inorganic materials and Organic Compounds, Electrolytic conductance behaviour of solutions, Acid-Base reactions, Solvolysis, Precipitation reactions, Complex formation reactions, Reduction –Oxidation (Redox) reactions

REFERENCE BOOKS

1. Concise Inorganic Chemistry J.D.Lee, 4th edition
2. Principles of inorganic chemistry, Puri, Sharma & Kalia
3. Inorganic chemistry by James Huheey, Keiter&Keiter
4. Text book of Inorganic Chemistry by Durrant and Durrant.
5. Inorganic Chemistry by G. D. Tuli
6. Advance Inorganic Chemistry Vol-II Satya Prakash (S.Chand)
7. Inorganic Chemistry: Principles of Structure and Reactivity by James E. Huheey, Ellen A. Keiter, Richard L. Keiter, Okhil K. Medhi
8. Advanced inorganic chemistry by Cotton and Wilkinson

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & Discussing the major terminologies related to Chemistry
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	33.4	16
Unit 2	33.3	16
Unit 3	33.3	16
Total	100	48

CCH-402 ANALYTICAL CHEMISTRY - I

RATIONALE: This course is designed to enable students to acquire basic understanding and the importance of Analytical Chemistry.

LEARNING OUTCOMES:

- Understand the concept of precipitation, redox and complexometric titrations
- Gain knowledge of principle and application of UV spectroscopy.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH-402	Analytical Chemistry	3	48	30	70	100

COURSE CONTENT

Unit 1: Ionic Equilibrium **No of lectures: 16 Weightage:33.4%**

- Introduction.
- Electrolysis, Ionic Equilibrium, Resistance, Conductance, Specific conductance, Equivalent Conductance, Molar Conductance, Equivalent Conductance at Infinite Dilution
- Types of Conductometric Titration
- Acid-Base Titrations
  - Strong Acid Vs Strong Base.
  - Strong Acid Vs Weak Base
  - Weak Acid Vs Strong Base
  - Weak Acid Vs Weak Base
  - Strong Acid + Weak Acid Vs Strong Base
- **Precipitation Titration**
- Titration curves, Feasibility, Indicators, Mohr, Volhard and Fajans' Methods, Factors affecting solubility

Unit 2: Analytical Titrations **No of lectures: 16 Weightage:33.3%**

(A) Complexometric Titrations

- Theory of complexometric titration involving EDTA,
- Study of EDTA complex formation taking disodium salt of EDTA and effect of pH, Ways of locating the end point,
- Estimation of Nickel and copper by complexometric titration by EDTA

(B) Redox titration

- Theory of redox titration
- Study of redox titration by electrochemical potential method
- Ways of locating the end point for redox titration

Unit 3: Ultra Violet Spectroscopy **No of lectures: 16 Weightage:33.3%**

- Introduction
- Beer-Lambert's Law, its limitation
- Type of electronic transitions
- Effect of conjugation
- Concept of Chromophore and Auxochrome
- Bathochromic, Hypsochromic, Hyperchromic, and Hypochromicshifts.
- Woodward – Fieser rules
- Problems of conjugated enes, enones, polyenes, aromatic ketones, aldehydes, acids and esters

REFERENCE BOOKS

1. Analytical Chemistry G.D. Christain
2. Fundamentals of Analytical Chemistry D.A.Skoog, D.M. West &F.J.Holler
3. Principles of Analytical Chemistry J.H. Kennedy
4. Analytical Chemistry – Principles & Techniques L.G.Hargis
5. Instrumental Methods of analysis: (CBS) H. H . Willard, L.L. Mirrit, J.A. Dean
6. Chemical Instrumentation: A Systematic approach- H.A. Strobel
7. Principles of Instrumental Analysis: Douglas A. Skoog., F. James Holler, Stanley R. Crouch, Cengage Learning; 6th Edition.
8. Quantitative Chemical Analysis: Daniel C. Harris, W H Freeman, New York.

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & Discussing the major terminologies related to Chemistry
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	33.4	16
Unit 2	33.3	16
Unit 3	33.3	16
Total	100	48

- Program will be offered as a part of sequential elective paper from semester-III to VI.
- Total three separate specialization are offered to B.Sc. chemistry students.
  (1) Synthetic Dyes
  (2) Polymers
  (3) Medicinal Chemistry
- Students have to opt any one subject out of these three subjects from semester-III.
- The same sequence of elective will be continued up to semester-VI.
- For each elective program for separate semester wise modules (courses) have been designed as follows…..

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory:20 Marks (One internal exam of 40 marks is to be conducted : 40/2=20 Marks)

Internal Practical: 30 Marks (Internal Practical Exam of 20 marks is to be conducted + 10 marks of assignment / Journal / Report)

For more transparency for the practical exam, 1 internal examiner from base institute and another examiner will be from other KSV institute.

Internal Theory Examination Structure

Q : 1	**Answer all questions each question carry 1 (one) mark.** **(Either from Theory / Practical)** • Short Questions • Multiple Choice Questions • Fill in the Blanks • True / False • Definition • Expand	10 Marks
Q : 2	**Attempt Any 6 out of 8** (Short Note or Descriptive Questions)	30 Marks
	Total	**40 Marks**

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
SE CH 401 A Chemistry of Dyes & Pigments

RATIONALE: This course is designed to enable students to acquire basic understanding of the dyes & pigments.

LEARNING OUTCOMES:

- Understand the concept of chemical sciences.
- Develop an understanding of the chemicals and its effects.
- Gain knowledge about the chemistry existing in and around the society.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
SE CH - 401-A	Chemistry of Dyes & Pigments	2 (1 hr Theory + 2 hr Practical	36	20	30	--	50

COURSE CONTENT

THEORYChemistry of Dyes & Pigments

Number of hours: 12
Weightage: 40%

- Relation between color and chemical constitution with reference to Witt's theory
- Introductions of dyes & pigments
- Difference between dyes & pigments.
- Classification of Pigments
- Methods of application to fibers
- Different types of Pigments
- Application of Pigments

PRACTICALS

Number of hours: 24

Preparation of Different Pigments:

- Preparation of White Pigments-ZnO, TiO_2
- Preparation of Blue Pigments-CuO, $Cu(NO_3)_2$
- Preparation of Red Pigment-$Co(NO_3)_2$
- Preparation of Pigment Yellow G
- Preparation of Pigment Yellow 10G
- Preparation of Benzedrine Orange

REFERENCES:

1.Synthetic organic chemistry by O.P. Agrawal
2. Industrial Chemistry By B K Sharma
3. Chemistry of synthetic dyes VOL I to VII by K. Venkatraman
4.An introduction to synthetic dyes by D. W. Ranghekar& P. P. Singh
5. A hand book of synthetic dyes and their application by C. T. Bhastana& V. H. Raichura& others
6. Chemical Technology By Shreve
7. Synthetic Practical organic chemistry by O.P. Agrawal
8. Synthetic Practical Organic by A I Vogel
9. Fabrics Dyeing & Printing on Textile fibers by June Fish
10.Printing Technics on Textile fibers by Janet Admonds
11. Practicals of Organic Chemistry of Dyes and Pigments by Dr. P N Dave

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	40	12
Unit 2	60	24
Total	100	36

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
POLYMER
SE CH 401-B Chemistry and Technology of Polymers

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
SE CH - 401-B	Chemistry and Technology of Polymers	2 (1 hr Theory + 2 hr Practical	36	20	30	--	50

RATIONALE: This course is designed to enable students to acquire basic understanding of the chemical technologies of polymers.

LEARNING OUTCOMES:

- Understand the concept of chemical sciences.
- Develop an understanding of the chemicals and its effects.
- Gain knowledge about the chemistry existing in and around the society.

COURSE CONTENT

Number of hours: 12
Weightage: 40%

THEORY:

- Molecular weight, Number average, Weight average, Viscosity average.
- Overview of Principles for Polymer Molecular Weight Characterization (Vapor Phase osmometry, Ebullioscopy, Cryoscopy, Sedimentation, Gel Permeation Chromatography)
- Introduction to tensile, impact, tear, abrasion and flexural properties of polymers.
- General idea of manufacturing of polymer products.
- Basic idea of compounding of rubbers and plastics.
- Some simple moulding techniques: injection moulding, compression moulding and blow moulding.
- Brief account on polymer industries and opportunities.

PRACTICALS

Number of hours: 24

Methods for determination of molecular weight of polymers

- End Group Analysis, Viscosity Average Molecular Weight
- Z-Average Molecular Weight
- Membrane osmometry
- Lamination using plastic sheet
- Shaping polymers using molding assembly

REFERENCES:

1.	F.W. Billmeyar, A text book of polymer science, John Wiley & Sons, 1971.
2.	V.R. Gowariker, N.V. Viswanathan and Sreedhar, Polymer Science, Wiley Easern Ltd., New Delhi, 1986.
3.	Maurice Morten, Rubber Technology, Van Nostrand, Reinold, New York.
4.	S. Paul, Surface Coatings
5.	B.K. Sharma, Polymer Chemistry, Goel Publishing House, Meerut
6.	M. Jenkins, Biomedical Polymers, University Birmingham, U.K.
7.	Introduction to Polymer Science and Technology, By Mustafa Akay

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	40	12
Unit 2	60	24
Total	100	36

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
Medicinal Chemistry
SE CH -401 C Medicinal Chemistry-II

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
SE CH -401-C	Medicinal Chemistry-II	2 (1 hr Theory + 2 hr Practical	36	20	30	--	50

COURSE CONTENT

Number of hours: 12
Weightage: 40%

THEORY
Drug metabolism and drug development

- Drug metabolism: Phase I and II metabolic reactions, biological and environmental factors affecting drug metabolism.
- Drug receptor interaction: transduction mechanisms and illustrative examples.
- Introduction to the rational development of the drug including the principles of isosterism.
- Introduction to recent advances in drug design: quantitative structure pharmacokinetic relationship (QSPR)

PRACTICALS

Number of hours: 24

Computational chemistry Drug design (Lipinski rule) demonstration through software

REFERENCES:

1. J. N. Delagado and W. A. R. Remers, Eds, Wilson and Giswold's Textbook of Organic, Medicinal and Pharmaceutical Chemistry, J. Lipponcott Co. Philadephia.
2. W. C. Foye, Principles of Medicinal Chemistry, Lea &Febiger, Philadelphia.
3. H. E. Wolff, Ed. Burger's Medicinal Chemistry, John Wiley & Sons, New York Oxford University Press, Oxford.
4. Daniel Lednicer, Strategies for Organic Drug Synthesis & Design, John Wiley & sons, USA.
5. B. N. Ladu, H. G. Mandel & E. L. Way, Fundamental of Drug Metabolism & Disposition, William & Wilkins co., Baltimore.
6. I. L. Finar, Organic Chemistry, Vol. I & II, ELBS/ Longman, London.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	40	12
Unit 2	60	24
Total	100	36

CMB 401- Microbial Metabolism

RATIONALE: This course is designed to enable students to acquire basic understanding of the metabolism and bimolecular interactions in the metabolic processes and also the study of various metabolic activity of the microbes. The enzymatic processes involved in metabolism

LEARNING OUTCOMES:

- Understand the concept of metabolism and various enzymatic reactions involved in metabolic fate of the microorganisms.
- Develop an understanding of the enzymes of microorganisms and their utility..
- Gain knowledge about the structure, function and applications of the bacterial enzymes as well as their role in their metabolism.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are eval uated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Teaching Scheme	Credits	Examination Scheme			Total Marks
				Hrs.	Max Marks		
		Theory Per Week			Mid Term	End Term	
CMB- 401	Microbial Metabolism	3	3	48	30	70	100

COURSE CONTENT

Number of lectures: 12 **Weightage: 25%**

Unit I: Enzymes-I

- General Introduction, Physical and Chemical properties of Enzymes(2hr)
- Structure of enzymes: Prosthetic group, Apo enzyme, Co-enzymes, co-factors. (2hr)
- Localization of enzymes: Extra cellular and intra cellular(1hr)
- Nomenclature and classification of enzymes. IUB system of enzyme classification(1hr)
- Active sites of enzymes(2hr)
- Mechanism of enzyme action. (2hr)
- Factors affecting enzyme activity. (2hr)

Number of lectures: 12 **Weightage: 25%**

Unit-II : Enzymes-II

Enzyme Kinetics- MM Equation (2hr)

- Transformation of MM plot into linear plot(1hr)
- Inhibition of enzyme activity: Competitive, noncompetitive and uncompetitive.
- Irreversible Inhibition(4hr)
- Regulation : Types of regulatory mechanisms: Feedback inhibition, energy linked control, precursor activation, zymogen activation, covalent modification and allosterism(5hr)

Number of lectures: 12 **Weightage: 25%**

Unit III: Nutrient Transport and Phototrophic Metabolism

Nutrient Transport

- Modes of Nutritional Uptake (1hr)
- Entry of nutrition in the cell, Passive diffusion, Facilitated diffusion and active transport Utilization of nutrients that cannot enter the cell. (2hr)

Phototrophic Metabolism

- Types of microbial metabolism(1hr)
- Phototrophic metabolism
  - Physiological groups of phototrophs (2hr)
  - Photosynthetic apparatus in photosynthetic eubacteria, cyclic and noncyclic photophosphorylation (2hr)
  - Photophosphorylation in halobacteria (1hr)
  - Pathways for CO2 fixation i. Calvin cycle, ii. Reductive TCA cycle (3hr)

Number of lectures: 12 **Weightage: 25%**

Unit IV: Metabolic Diversity

- Chemolithotrophy: Nitrogen fixation. Hydrogen oxidation, Sulfur oxidation, Ferrous iron (Fe2+) oxidation, Nitrification, Anammox, (5hr)
- Anaerobic respiration, Denitrification — nitrate as electron acceptor (2hr)
- Sulfate reduction — sulfate as electron acceptor, Electron donors, Energy for reduction(1hr)
- Special metabolic properties, Methanogenesis, Methylotrophy, Syntrophy (2hr)
- Acetogenesis — carbon dioxide as electron acceptor, Other inorganic electron acceptors, Organic terminal electron acceptors(2hr)

REFERENCES:

1. Microbiology, Authors- Pelczar, Chan and Kreig.
2. Microbiology- an Introduction- (8th Edn), Authors- Tortora, G.J., Funke, B.R., Case, C.L.
3. General Microbiology, Authors- Stainer, Ingharam, Wheelis and Painter.
4. Biology of Microorganisms, Authors- Brock and Madigan.
5. Fundamental Principles of Bacteriology, Author- A.J. Salle.
6. Introduction to Microbiology, Authors- Ingraham and Ingraham.
7. Enzymes- Palmer
8. Enzymology- Devsena
9. Elementary Microbiology, Author- H. A. Modi
10. Textbook of Microbiology, Authors- Dubey and Maheshwari.
11. Microbiology, A Practical Approach. Authors- Patel and Phanse
12. Experiments in Biotechnology. Authors- Nighojkar and Nighojka
13. General Microbiology, Authors- Powar and Daginawala.
14. Fundamentals in Microbiology, Authors- Frobisher and Hinsdinn.
15. Microbiology, Author- S.S. Purohit.
16. Microbiology, Author- R.P.Singh.

17. Laboratory Experiments in Microbiology- Gunasekaran
18. Microbiology: A Laboratory Manual (10th Edition)-James Cappuccino (Author), Natalie Sherman (Author)

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & Discussing the major terminologies related to Microbial metabolism and various diverse mechanism of the microbial metabolic activity.
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	25	12
Unit 2	25	12
Unit 3	25	12
Unit 4	25	12
Total	100	48

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
CMB 402- Medical Microbiology

RATIONALE: This course is designed to enable students to acquire basic understanding of the Immune system, Pathgogenesis and disorders of human and also the various diseases occurred due to microorganisms.

LEARNING OUTCOMES:

- Understand the concept of Immune system an defense mechanism
- Gain knowledge about the various diseases caused by microorganisms and their awareness.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Teaching Scheme	Credits	Examination Scheme			Total Marks
				Hrs.	Max Marks		
		Theory Per Week			Mid Term	End Term	
CMB- 402	Medical Microbiology	3	3	48	30	70	100

COURSE CONTENT

Number of lectures: 8 **Weightage: 15%**

Unit I: Epidemiology of Infectious Diseases

- Pathogenesis and its mechanisms (2hr)
- Epidemiological study. (2hr)
- Types of diseases- Epidemic, pandemic and sporadic. (2hr)
- Nosocomial infection(2hr)

Number of lectures: 16 **Weightage: 35%**

Unit-II: Antimicrobial Agents

- Antibiotics- Mode of action. (3hr)
- Antibacterial(2hr) ,Antiviral, (2hr) Antiprotozoal (2hr) and Antifungal drugs. (1hr)
- Development of resistance. (3hr)
- Transmission of drug resistance. (3hr)

Number of lectures: 12 **Weightage: 25%**

Unit III: Epidemiology of Microbial (Bacterial) Diseases – Cause, symptoms ,preventive measures and treatment

- Anthrax , Pertussis (whooping cough) , Typhoid, Rocky Mountain spotted Fever (4hr)
- Cholera, Strep throat, Chlamydiasis (new) (4hr)
- Syphilis, Dental Caries (tooth decay) , Tetanus (2hr)
- Tuberculosis, Lyme Disease , Peptic Ulcer Disease (2hr)

Number of lectures: 12 **Weightage: 25%**

Unit IV: Epidemiology of Microbial ((Fungal, Viral and Protozoal) Diseases – Cause, symptoms ,preventive measures and treatment

- Fungal skin infections- Mycosis, Candidiasis (4hr)

- Virus- Measles, Mumps, Hepatitis, Rabies (4hr)
- Protozoa- Malaria, Amebiasis and Leishmaniasis(4hr)

REFERENCES:

1. Text of Microbiology - Ananthanarayanan and Panikar.
2. Medical Microbiology, Vol. 1 : Microbial Infection, Vol. 2 : Practical Medical Microbiology, Authors- Mackie and McCartney.
3. Epidemiology and Infections - Smith
4. Lecture Notes in Immunology - I.R. Todd
5. Microbiology in Clinical Practice - D.C. Shanson.
6. Diagnostic Microbiology - Baron, Peterson and Finegold.
7. Microbiology An Introduction- Gerard J. Tortora
8. Immunology, Author- J. Kuby.

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & Discussing the major terminologies related to diseases and defense mechanism of human
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	15	8
Unit 2	35	16
Unit 3	25	12
Unit 4	25	12
Total	100	48

- Program will be offered as a part of sequential elective paper from semester-III to VI.
- o Total two separate specialization are offered to B.Sc. microbiology students.
  1. Food Technology
  2. Pathology
- o Students have to opt any one subject out of these two subjects from semester-III.
- o The same sequence of elective will be continued up to semester-VI.
- o For each elective program for separate semester wise modules (courses) have been designed as follows

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory:20 Marks (One internal exam of 40 marks is to be conducted : 40/2=20 Marks)

Internal Practical: 30 Marks (Internal Practical Exam of 20 marks is to be conducted + 10 marks of assignment / Journal / Report)

For more transparency for the practical exam, 1 internal examiner from base institute and another examiner will be from other KSV institute.

Internal Theory Examination Structure

Q : 1	**Answer all questions each question carry 1 (one) mark.** **(Either from Theory / Practical)** • Short Questions • Multiple Choice Questions • Fill in the Blanks • True / False • Definition • Expand	10 Marks
Q : 2	**Attempt Any 6 out of 8** (Short Note or Descriptive Questions)	30 Marks
	Total	**40 Marks**

SE MB 401 A Food Microbiology II

RATIONALE: This course is designed to enable students to acquire basic understanding of microorganisms in the Food microbiology. The understanding and knowledge of freezing of food.

LEARNING OUTCOMES:

- To impart knowledge of various Microbes involved in food contamination
- The knowledge of freezing and preserving the food.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis End Term Examination conducted by University examination for 50 marks.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
SE MB-401 A	Food Microbiology II	2 (1 hr Theory + 2 hr Practical	36	20	30	--	50

COURSE CONTENT

Number of lectures: 12 **Weightage: 40%**

Unit 1:

Food Microbiology

- Classification of bacteria based on temperature, pH, water activity, nutrient and oxygen requirements,
- Typical growth curve of micro-organisms, classification of food based on pH, definition of shelf life, perishable foods, semi perishable foods, shelf stable foods.
- Food infection, food intoxication.
- Freezing- Introduction to refrigeration and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, introduction to thawing, changes during thawing and its effect on food.

LIST OF EXPERIMENT

- Estimation of pH of different foods
- Adulteration tests for different foods: Milk and milk products
- Adulteration tests for different foods: Tea and coffee etc
- To give the concept of shelf life of different foods.(processed andunprocessed)
- To study blanching and study the concept of Asepsis.
- To perform pasteurization and sterilization of foods.
- Standards of identity, standards of minimum quality and standards of fill of container.
- Identification of different types of packaging materials used in the food industry.

REFERENCES

1. . Microbiology, Authors- Pelczar, Chan and Kreig.
2. Microbiology- an Introduction- (8th Edn), Authors- Tortora, G.J., Funke, B.R., Case, C.L.
3. Food Microbiology. 2nd Edition By Adams
4. Basic Food Microbiology by Banwart George J.
5.Food Microbiology: Fundamentals and Frontiers by Dolle
6. Food Microbiology : Fraizer
7. Potter, Norman. M., Food Science, CBS Publication, 1996
8.Manay, S. & Shadaksharaswami, M., Foods: Facts and Principles, New Age Publishers, 2004.
9.De Sukumar. , Outlines of Dairy Technology, Oxford University Press, 2007

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	40	12
Unit 2	60	24
Total	100	36

SE MB- 401 B Pathology –II

RATIONALE: This course is designed to enable students to acquire basic understanding of the Immune system, blood and functions of blood cells and storage of blood.

LEARNING OUTCOMES:

- Understand the concept of blood
- Gain knowledge about the various blood cell structure and functions.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis End Term Examination conducted by University examination for 50 marks.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
SE MB-401 B	Pathology -II	2 (1 hr Theory + 2 hr Practical	36	20	30	--	50

COURSE CONTENT

Number of lectures: 12 **Weightage: 50%**

Unit 1: Hematology and Blood banking

- Introduction to haematology and laboratory organization Lab safety and Instrumentation.
- Formation of blood.
- Composition and functions of blood.
- Various anticoagulants, their uses, mode of action and their merits and demerits.
- Introduction and Clinical Significance of Blood Transfusion.
- Selection criteria of blood donors and adverse donor reactions and management.
- Collection of Blood for Transfusion.
- Preparation and use of blood components.
- Storage of Blood and blood components for transfusion
- Transfusion reactions and Hemolytic Diseases.

List Of Experiments

- ABO group,
- Bleeding Time and Clotting Time
- Rh type
- Crossmatch
- Blood component preparation

Coombs Test

REFERENCES:

1. Essentials of Haematology- S. M. Kawathalkar
2. Atlas and Text of Haematology – Dr.Jitender Singh
3. Clinical Hematology Atlas – Bernadette F. Rodak, Jacqueline H. Carr
4. Wintrobe's Clinical Hematology – John P. Greer, Daniel A. Arber

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	40	12
Unit 2	60	24
Total	100	36

CPH-401 Basics Physics – III

RATIONALE: This course is designed to enable students to acquire basic understanding of the Physical world, its origin and structure to help the potential application of the unexplored and unidentified organisms in the industry.

LEARNING OUTCOMES:

- Understand the concept of origin of Physical Science.
- Develop a concrete understanding of the Physical systems around us.
- Gain knowledge about the various laws of nature, new frontier of physics with potential applications in our day by day life.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CPH- 401	Basic Physics-III	3	48	30	70	100

COURSE CONTENT

Unit – 1 **Lectures – 16** **Weightage – 33%**

Quantum Mechanics:

The Schrodinger equationin one dimension,The statistical interpretation, Probability: Discrete Variables and Continuous Variables, Normalization, Momentum, The Uncertainty Principle, The infinite square well,Illustrative examples.

Unit – 2 **Lectures – 16** **Weightage – 33%**

The Basic concepts of Plasma:

Introduction , Composition and Characteristics of a Plasma, Collisions, Elastic collisions, Inelastic collisions, Surface Phenomena, Transport Phenomena, Diffusion and Mobility, Viscosity, Conductivity, Recombination, Ohm's law, Gas Discharge, Composition of various natural and Man-made Plasma, Plasma diagnostics, Plasma waves and Instabilities Confinement of Plasma, Space Plasma, Illustrative examples.

Unit – 3 **Lectures – 16** **Weightage – 34%**

Resolving Power:

Resolving Power, Rayleigh's Criterion, Limit of resolution of the eye, Limit of resolution of a convex lenses, Resolving Power of Optical Instrument, Conditions for Resolutions according to Lord Rayleigh, Resolving Power of a telescope, Relation between magnifying power of telescope, Resolving power of a microscope, ways of increasing resolution, Magnification versus resolution, resolving power of a Prism, Resolving Power of a Plane transmission grating. Illustrative Examples

TEXT BOOKS:

1. Quantum Mechanics by Griffiths.
2. Elements of Plasma Physics by S.N.Goswami New Central book Agency (P) Ltd., Calcutta.
3. A text book of OPTICS by Dr. N. Subrahmanyam, Brijlal, Dr. M. N. Avadhanulu – S.Chand

REFERENCES:

1. A Text Book of Quantum Mechanics by Mathews and K. Venkatesan Tata Mc-GrawHill Publication.
2. Quantum Mechanics by Aruldhas.
3. Quantum Mechanics by Ghatak and Loknath.
4. Quantum Mechanics by Schiff.
5. Plasma Physics by S. N. Sen
6. Introduction to Plasma Physics and Controlled Fusion Vol-1 by F. F. Chen.
7. Optics by Ajay Ghatak.
8. Principle of Optics by B.

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	33	16
Unit 2	33	16
Unit 3	34	16
Total	100	48

CPH 402- Basic Physics-IV

RATIONALE: This course is designed to enable students to acquire basic understanding of the basic principles of physics.

LEARNING OUTCOMES:

- Understand the concept of physical sciences.
- Develop an understanding of the various physical laws and its applications.
- Gain knowledge about the physics existing in and around the society.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CPH- 402	Basic Physics-IV	3	48	30	70	100

COURSE CONTENT

Unit – 1 **Lectures – 16** **Weightage – 33%**

Digital Electronics:

Introduction, Number systems used in Digital Electronics, Decimal, Binary, Hexadecimal and Octal, Binary Codes-(A) BCD, (B) Gray, (C) Excess-3 Codes, Basic logic gates (AND,OR,NOT), NAND ,NOR and XOR gate, De-Morgan's theorem,(i) Binary to Gray Code Converter (ii) A Parity Checker (iii) The Half Adder (iv) The FullAdder (v) Parallel Adder (vi)Half subtractor, (vii)Full subtractor, Illustrative examples.

A.C. Bridges:

Maxwell's Bridge, Schering Bridge, Anderson bridge, Illustrative examples.

Unit – 2 **Lectures – 16** **Weightage – 34%**

Detectors:

Introduction, Detectors for Nuclear Particles, (i) Proportional Counter (ii) The Geiger Counter, (iii) Scintillation Counter, (iv) Solid state or Semiconductor detectors

Radioactivity

Introduction, properties of radioactive rays, the law of radioactive decay, unit of activity, Radioactive growth and decay, Ideal equilibrium, Transient equilibrium and secular equilibrium, Artificial Radioactivity, Determination of the age of Earth, Carbon Dating, Illustrative Examples

Unit – 3 **Lectures – 16** **Weightage – 33%**

Magnetostatics:

Magnetic Fields, Currents, The Bio-Savart Law, Steady Currents, The magnetic field of a steady current, The divergence and curl of B, Application of Ampere's law, Comparison of Magnetostatics and Electrostatics, Scalar and Vector potentials, The magnetic vector potential, Illustrative examples.

TEXTBOOKS:

1. Hand book of Electronics by Gupta & Kumar 30th Revised Edition, 2002 PragatiPrakashan, Meerut.
2. Digital Logic and Computer Design by M.Morris Mano.
3. Nuclear Physics By S. B. Patel
4. Electrodynamics by D. J. Griffiths

REFERENCES :

1. Electricity and Magnetism ByK.K.Tewari (S.Chand& Company Ltd.)
2. Nuclear Physics By D. C. Tayal
3. Nuclear Physics By Kaplan
4. Electromagnetics by B. B. Laud

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	33	16
Unit 2	34	16
Unit 3	33	16
Total	100	48

- Program will be offered as a part of sequential elective paper from semester-III to VI.
- Total three separate specialization are offered to B.Sc. chemistry students.
  (1) Engineering Physics
  (2) Applied Physics
- Students have to opt any one subject out of these three subjects from semester-III.
- The same sequence of elective will be continued up to semester-VI.
- For each elective program for separate semester wise modules (courses) have been designed as follows…..

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory:20 Marks (One internal exam of 40 marks is to be conducted : 40/2=20 Marks)

Internal Practical: 30 Marks (Internal Practical Exam of 20 marks is to be conducted + 10 marks of assignment / Journal / Report)

For more transparency for the practical exam, 1 internal examiner from base institute and another examiner will be from other KSV institute.

Internal Theory Examination Structure

Q : 1	**Answer all questions each question carry 1 (one) mark.** **(Either from Theory / Practical)** • Short Questions • Multiple Choice Questions • Fill in the Blanks • True / False • Definition • Expand	10 Marks
Q : 2	**Attempt Any 6 out of 8** (Short Note or Descriptive Questions)	30 Marks
	Total	**40 Marks**

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
(Subjective Elective) Paper: SE PH 401-A
ENGINEERING PHYSICS-2

RATIONALE: This course is designed to enable students to acquire understanding about development and measurement of some basic of Engineering Physics.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Viva	End Term	
SE PH 401 A	ENGINEERING PHYSICS-2	**2**	**24**	**20**	**30**	**--**	**50**

COURSE CONTENT

Unit – 1 **Lectures – 12** **Weightage – 50%**

LASER

Introduction, Characteristics of Laser, Einstein Theory:- Absorption, Spontaneous & Stimulated emission, Relation between Einstein's Coefficients A& B, Ratio of Spontaneous and Stimulated Emission Rates, Basic Concepts in Laser Physics:- Population Inversion, Pumping, Life Time, Metastable State, Active Medium, Optical Resonator, Principle of Laser, Types of Laser :- CO_2 – Laser, Nd-YAG Laser, Semiconductor Laser, Applications of Laser.

Unit – 2 **Lectures – 12** **Weightage – 50%**

OPTOELECTRONIC DEVICES

Introduction of Semiconductors & Optoelectronic devices

Principle, Construction, Working & Applications of :-

(a) LDR (Light Dependent Resistors)
(b) Photo Diode
(c) Photo Transistors
(d) Solar Cell
(e) IR Emitters
(f) Light Emitting Diode
(g) Liquid Crystal Display
(h) Cathode Ray Tubes (CRT)

Illustrative Examples

REFERENCES:

1. A textbooks of Optics by Dr. N. Subrahmanyam, Brijlal , Dr. M. N. Avadhanulu – S.Chand
2. Optics by Ajay Ghatak.
3. Electronics Devices and Circuits by J B Gupta (S. K. Kataria& Sons)
4. Handbook of Electronics By Gupta Kumar

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit I	50	12
Unit II	50	12
Total	100	24

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
(Subjective Elective) Paper: SE PH- 401 B
APPLIED PHYSICS-2

RATIONALE: This course is designed to enable students to acquire understanding about development and measurement of applied Physics.

Subject Code	Subject Title	Credits	Theory / Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Viva	End Term	
SE PH-401 B	APPLIED PHYSICS-2	2	24	20	30	--	50

COURSE CONTENT

Unit – 1 **Lectures – 12** **Weightage – 50%**

Elasticity

Classification of Elastic Material, Stress, Strain, Hook's law, Elastic behaviour of material, factors affecting elasticity, classification of elastic modulus, Twisting couple on a wire, Torsional pendulum and determination of moment of inertia of a body, determination of torsional rigidity modulus, bending moment and bending moment of beam, Cantilever and total depression, Young's modulus of Uniform and Non-Uniform bending of beam.

Unit – 2 **Lectures – 12** **Weightage – 50%**

Applied Nuclear Physics

Basic Properties of Nucleus, Nuclear Forces, Binding energy of Nucleus, Nuclear stability, Nuclear Model: Nuclear Shell Model, Nuclear Liquid Drop Model, Radioactivity: Artificial and induced radioactivity, relation between Half-Life time and Mean Life Time, Alpha decay, Beta Decay, Gamma Decay, Nuclear Radiation Detector: Ionization Chamber, Geiger Muller Counter, Scintillation Counter, Wilson's cloud Chamber, semiconductor detector

REFERENCES:

1. Engineering Physics by H. K. Malik, A. K. Singh, McGraw Hill Education
2. Engineering Physics by V. Rajendran, McGraw Hill Education

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit I	50	12
Unit II	50	12
Total	100	24

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
Semester – IV
CMAT 401- Advanced Calculus

Rationale:
This course is designed to enable students to acquire the understanding and practice the applications of curvature and integrals applied to real life mathematical problems.

Learning Outcome:
After successfully completion of the course, the student will be able to …

- Understand the concept of curvature of curves and points of inflexion.
- Understand the several forms of beta and gamma functions.
- Know about multiple integrals.
- Understand the concept of linear transformations

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CMAT- 401	Advanced Calculus	3	48	30	70	100

Contents:

UNIT-1 CURVATURE & RADIUS OF CURVATURE

Number of lectures: 12 Weightage: 25%

Curvature of Plane curve,Radius of curvature of plane curve, Singular point for plane curve, Point of inflexion for plane curve.

UNIT-2 IMPROPER INTEGRAL

Number of lectures: 12 Weightage: 25%

Beta function and Gamma function, Convergence of Beta function and Gamma function, Relation between them, Its simple properties and applications, several forms of Beta function

UNIT-3 MULTIPLE INTEGRAL

Number of lectures: 12 Weightage: 25%

Double Integral, Integral on non rectangle regions, transformation to polar coordinate Change of the order of integration, Triple integration, transformation to polar and cylindrical co-ordinate

UNIT-4 VECTOR ANALYSIS, LINE & SURFACE INTEGRAL

Number of lectures: 12 Weightage: 25%

Gradient of scalar function, Divergence and Curl of a vector function, Line integral, Surface Integral, Green's theorem, Stoke's and Gauss's Theorem

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & discussing mathematics formulas and derivations.
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

Reference Books:

1. Integral Calculus, Shantinarayan S. Chand, New Delhi (Course Book)
2. Advanced Calculus, D V Widder , Prentice Hall , New Delhi
3. Advanced Calculus Vol : I & II, T M Apostol, Blaisdoll
4. Advanced Calculus, R C Buck, MacMillan

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	25%	12
Unit 2	25%	12
Unit 3	25%	12
Unit 4	25%	12
Total	100	48

CMAT 402 – Advanced Linear Algebra

Rationale:

This course is designed to enable students to acquire the understanding of advanced linear algebra.

Learning Outcome:

After successfully completion of the course, the student will be able to …

- Understand the concept of linear transformation applied to various problems.
- Understand the several forms of linear functional and duality.
- Know about inner product space.
- Understand the concept of eigen values and eigen vectors.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CMAT- 402	Advanced Linear Algebra	3	48	30	70	100

Unit I : Matrices of a Linear Transformation

Number of Lectures: 12 **Weightage: 25%**

Definition of a Matrix of a linear transformation, Linear Transformation associated with a matrix, the dimension of L(U,V), and its determination, Rank and Nullity of a Matrix, invertibility of system of linear equations.

UNIT II : Linear Functional And Duality

Number of Lectures: 12 **Weightage: 25%**

Definition of linear functional and its examples, Definition of Dual space and Dual basis and its examples, Adjoint of a linear operator, its properties and examples

UNIT III: Inner Product Space

Number of Lectures: 12 **Weightage: 25%**

Definition of inner product space, Norm, Orthogonality, Schwarz's & Triangular inequality, Parallelogram law, Orthonornal basis

UNIT IV: Eigen Values and Eigen Vectors

Number of Lectures: 12 **Weightage: 25%**

Eigen values and eigen vectors of a linear transformation, Characteristic polynomial, Cayley – Hamilton theorem, Finding inverse of a matrix using C–H theorem, minimal polynomial deductions.

Reference Books:

1. An Introduction to Linear Algebra' by V. Krishnamurthy, V P Mainra, J L Arora, Affiliated East-west Press Pvt Ltd., New Delhi
2. Linear Algebra , Ramchandra Rao, P. Bhimasankar, Tata MacGrawHill
3. Topics in Algebra, I N Herstein, Wiley Eastern Ltd
4. Linear Algebra, S K Berberion, Oxford University Press
5. Linear Algebra Problem Book, P R Holmos, Cambridge University Press
6. Linera Algebra, Sharma and Vashishtha, Krishna Prakashan, Meerut
7. Linear Algebra, Gupta K P, PragatiPrakashan, Meerut
8. Linear Algebra, G Paria, New Central book agency Ltd, Calcutta
9. SurekhBijGanit, I H Sheth, University GranthNirman Board (Gujarati)

INSTRUCTION STRATEGIES

1.Interactions with the students to understand the level of students

2.Explaining & discussing mathematics formulas and derivations.

3.Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams

4.Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	25%	12
Unit 2	25%	12
Unit 3	25%	12
Unit 4	25%	12
Total	100	48

- Program will be offered as a part of sequential elective paper from semester-III to VI.
- Total three separate specialization are offered to B.Sc. chemistry students.
  (1) Business Mathematics
  (2) Discrete Mathematics
- Students have to opt any one subject out of these three subjects from semester-III.
- The same sequence of elective will be continued up to semester-VI.
- For each elective program for separate semester wise modules (courses) have been designed as follows…..

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 40

Internal Theory:20 Marks (One internal exam of 40 marks is to be conducted : 40/2=20 Marks)

Internal Practical: 30 Marks (Internal Practical Exam of 20 marks is to be conducted + 10 marks of assignment / Journal / Report)

For more transparency for the practical exam, 1 internal examiner from base institute and another examiner will be from other KSV institute.

Internal Theory Examination Structure

Q : 1	**Answer all questions each question carry 1 (one) mark.** **(Either from Theory / Practical)** • Short Questions • Multiple Choice Questions • Fill in the Blanks • True / False • Definition • Expand	10 Marks
Q : 2	**Attempt Any 6 out of 8** (Short Note or Descriptive Questions)	30 Marks
	Total	**40 Marks**

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
Subjective Elective
Business Mathematics- II Paper: SE Math- 401 A

RATIONALE: This course is designed to enable students to acquire understanding about development and measurement of some basic instruments

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Viva	End Term	
SE Math -401-A	Business Mathematics- II	2	24	20	30	--	50

COURSE CONTENT

Unit-I

Number of lectures: 12 **Weightage: 50%**

Permutations and Combinations: [only examples] Fundamental rules of counting, Definition of Permutations and Permutation of n different things, Permutation of repeated things, Circular Permutation, Definition of Combination standard results and examples.

Unit-II

Number of lectures: 12 **Weightage: 50%**

Classical- Statistical (or Empirical)- Axiomatic (Modern) definition of probability, Definitions of event, equally likely, mutually exclusive and exhaustive events, Probability theorems, Statement's of Baye's theorem and its examples, Conditional probability and its examples.

REFERENCES:

1. Set Theory & Related Topics, Seymour Lipschutz McGraw-Hill book Company, Singapur
2. Buisness Statistics, Bharat Jhunjhunwala, S.Chand Prakashan
3. Statistics, R.S.N Pillai & V. Bagavathi, S. Chand & Company, New Delhi

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & discussing mathematics formulas and derivations.
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit I	50	12
Unit II	50	12
Total	100	24

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
Subjective Elective Discrete Mathematics- II

SE Math- 401 B

- **RATIONALE:** This course is designed to enable students to acquire understanding of lattices and Boolean algebra to develop mathematical logic

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Viva	End Term	
SE Math -401-B	Discrete Mathematics- II	2	24	20	30	--	50

COURSE CONTENT

Unit-I
Number of lectures: 12
Weightage: 50%
Direct product and homomorphism, complete lattices, bounds of lattices, distributivelattice, complemented lattices.

Unit-II
Number of lectures: 12 **Weightage: 50%**
Introduction, definition and important properties of Boolean Algebra, Sub Boolean algebra, direct product and homomorphism, join-irreducible, meet-irreducible, atoms, anti atoms, Stone's representation theorem. (Without Proof)
Note : No proof is required for Theorems or Results on lattices and Boolean Algebra. Theorems should be justified and explained by suitable examples.

REFERENCES:

(1)Shoenfield , Addison Wesley - "Mathematical Logic"-
(2) Change, C. L and Lee, R.T.C – " Symbolic Logic and Mechanical Theorem Proving", Academic Press.
(3)Discrete mathematics and its applications- Kenneth H. Rosen, 6th edition, McGraw Hill International Edition
(4) Schaum's Outline of Theory and Problems of Discrete Mathematics, Marc Lipson and Seymour Lipschutz

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & discussing mathematics formulas and derivations.
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit I	50	12
Unit II	50	12
Total	100	24

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
FCG 401- Basic English – IV

RATIONALE: This course is designed to enable students to acquire basic understanding ofEnglish grammar. The course would help students to fortify their knowledge of English and strengthen their basic communication abilities.

LEARNING OUTCOMES:

Acquire interest in English language and literature through textbook lessons.

Acquire additional vocabulary as prescribed in the textbook through use of idioms and phrases in meaningful sentences.

Understand the functions and usage of identification of clauses, non-finite verbs and prefix and suffix.

Develop language skills of reading through filling in appropriate words in blanks, correcting errors, choosing correct forms out of alternative choices, joining clauses, sentences as directed, replacing indicated sections with single word / opposite / synonyms etc.

Develop the skill of preparing application for jobs.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only tomeasure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 15 marks and End Term Examination conducted by University examination for 35 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
FCG - 401	Basic English – IV	2	24	15	35	50

COURSE CONTENT

Number of lectures: 8	Weightage: 33%
Unit 1: Lesson 8 to 12	
'Glimpses of Life – An Anthology of Short Stories	(Orient Black Swan
Lesson 8 "The Voter" by Chinua Achebe Lesson 9 "The Eyes are not here" by Ruskin Bond Lesson 10 "The Hitch-Hiker" by Roald Dahl Lesson 11 "The Cabuliwallah" by Rabindranath Tagore Lesson 12 "The Diamond Necklace" by Guy de Maupassant)	

Unit 2	Number of lectures: 4	Weightage: 17%
Vocabulary (Text based) Use of Idioms and Phrases in meaningful sentences		

Unit 3	Number of lectures: 8	Weightage: 33%
Usage of English Grammar • One-word Substitute • Prefix and Suffix • Synonyms and Antonyms **Group Discussion** • Form • Importance of GD • Advantages and Disadvantages of GD		
Unit 4	**Number of lectures: 4**	**Weightage: 17%**
Writing Skill • Essay writing • Self-Assessment (SWOT Analysis of one's self and its importance)		

REFERENCES:

1. High School English Grammar – Wrenn & Martin
2. Contemporary English Grammar – David Green
3.Communicatio Skills- Anasuya Kalavar, Tech-Max publication, Pune
4. Communicative English- Third Edition- Prakash Khuman and Bhupesh Gupta, Books India Publications, Ahmedabad

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & discussing English language structures.
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme % Weightage	Teaching Scheme No. of Lecture
Unit 1	33	8
Unit 2	17	4
Unit 3	33	8
Unit 4	17	4
Total	**100**	**24**

REFERENCES

Text Book:

1. Management, James A .F. Stoner, R. Edward Freeman, Daniel R. Gilbert. Jr, Pearson, Latest Edition.

Reference Books

1 Principles of Management, Koontz, Latest Edition, Tata McGraw Hill

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
PCH 401- Chemistry Practical IV

RATIONALE: This course is designed to enable students to acquire on hand basic understanding of the chemical world, its origin and structure to help the potential application of the unexplored and unidentified compounds in the industry. These practical make the students capable and competent to work in chemistry related industries.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical properties of compounds.
- Gain knowledge about the structure, function and applications of the chemicals compounds.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. General viva-voce will be conducted to analyze the knowledge of the student.

Subject Code	Subject Title	Credits	Practical		Total Marks
			Hrs.	Max Marks	
PCH- 401	Chemistry Practicals-IV	3	6 hrs	100	100

LIST OF EXPERIMENTS

Laboratory Course -I

Inorganic Chemistry (Any 7) (3 hours per practical)

1. To perform inorganic qualitative analysis of a mixture containing 4 radicals (except PO_4^{-3}, BO_3^{-3}, $AsO_4^{-3,}$ SO_3^{-3}, O^{-2})

Laboratory Course-II

Analytical Chemistry (3 hours per practical)

A. Volumetric Analysis of Cu, Zn, Ni

1. To determine the amount of Zn in Zinc sulphate by EDTA titration method.
2. To determine the amount of Ni in Nickel chloride by EDTA titration method.
3. To determine the amount of Cu in cupric chloride by EDTA titration method.

B. Estimation of Glucose/Aniline/Phenol (Any Two)

1. To determine the amount of Aniline by Brominating Method.
2. To determine the amount of Phenol by Brominating Method.
3. To determine the amount of Glucose by oxidation Method.

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

PCH 401- Chemistry Practical IV

PRACTICAL EXAMINATION PATTERN FOR CHEMISTRY:

- One day per batch(27 to 30 student per batch)
- Certified Journals are compulsory for the exam

Laboratory Course –I Analytical Chemistry Viva voce	3.5 hrs	 40 marks 5 marks
Laboratory Course -II Inorganic Chemistry Viva voce	3.5 hrs	 40 marks 5 marks
Journal		10 marks
Total marks		100 marks

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
PPH 401-Physics Practical-IV

RATIONALE: This course is designed to enable students to acquire on hand basic understanding of the physical phenomena, fundamental laws of physics, as well as on hand experience of handling the various instruments which have much use in industries as well as in research institutes. These experiments make the students capable and competent to work in physics related industries and research institutes

LEARNING OUTCOMES:

- Understand the basic principles and of physics.
- Develop an understanding about the handling of various instruments.
- Develop an analytical attitude for physical laws through simple and basic experiments.
- Gain knowledge and expertise in experimental physics field.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. General viva-voce will be conducted to analyse the knowledge of the student.

Subject Code	Subject Title	Credits	Practical		Total Marks
			Hrs.	Max Marks	
PCH- 401	Physics Practical-IV	3	6 Hrs	100	100

LIST OF EXPERIMENTS

Laboratory Course-1: Non Circuitry Experiments

1. To determine the value of 'Io', 'r' & 'a' using Resonance pendulum.
2. To study the X-ray diffraction (Powder) Pattern.
3. To find the decay of Temperature when body is allowed to cool. (Thermocouple)
4. To study elliptically polarized light using photocell and quarter wave plate.
5. To determine *J* using Hartzmann formula
6. To measure the activation energy of a semiconductor
7. To study the absorption co-efficient of liquid using photocell.

Laboratory Course-2:Circuitry Experiments

1. To determine current sensitivity, volt sensitivity, figure of meritandR_g of B.G.
2. To measure the high resistance by equal deflection method.
3. To measure the low resistance by Carry foster bridge.
4. To determine low value of 'C' using Schering bridge.
5. To study the characteristics of UJT & Determination of R_{BB}, V_D& η
6. To study the characteristics of a Photodiode.
7. To verify De Morgan's Theorems using IC-7400.
8. To determine self-inductance with the help of Anderson Bridge.

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

PRACTICAL EXAMINATION PATTERN FOR PHYSICS:

- One day per batch(27 to 30 student per batch)
- Certified Journals are compulsory for the exam

PRACTICAL- I Non Circuitry Experiment Viva voce	3 hrs	 40 marks 5 marks
PRACTICAL- II Circuitry Experiments Viva voce	3 hrs	 40 marks 5 marks
Journal		10 marks
Total marks		100 marks

PMAT 401 : Mathematics Practical – II

Subject Code	Subject Title	Credits	External Practical		Total Marks
			Hrs.	Max Marks	
PCMAT-401	Mathematics Practical – II	3	6 Hrs	100	100

(A) Practicals on Advanced Calculus and Linear Algebra:

1. Application of double Integration (graphically) (Two Practicals)
2. Application of Beta and Gamma functions (Two Practicals)
3. Application of Green's Theorem
4. Application of Stokes' theorem
5. Application of divergence theorems.
6. Applications of a linear transformation associated with given matrix.
7. Applications of a matrix associated with linear transformation
8. Verifications on Rank-Nullity theorem in matrices
9. Application of solution of system of linear systems
10. Application of a Dual Space
11. Application of Cayley- Hamilton theorem
12. Application of Eigen value and Eigen vectors of a linear transformation
13. Application of minimal polynomial deduction
14. Application to verify inner product space.

(B) Practical's on Advanced Numerical Analysis

Application of solution of an equation by:

1. Graphical method.
2. Method of False Position.
3. Method of Bisection.
4. Method of Iteration.
5. Newton Raphson method.
6. Application of Synthetic division method.
7. Application of Laplace Everett's interpolation formula.
8. Application of Bessel's interpolation formula.
9. Application on divided difference formula.
10. Application on Numerical differentiation.
11. Application on Numerical Integration.
12. Application on Euler's method.
13. Application on solving a system of equations using Gauss- Elimination method.
14. Application on solving a system of equations using Gauss-Jordan method.

PMAT 401 : Mathematics Practical – II

PRACTICAL EXAMINATION PATTERN FOR MATHEMATICS:

- One day per batch(27 to 30 student per batch)
- Certified Journals are compulsory for the exam

PRACTICAL- I Advanced Calculus and Linear Algebra Viva voce	3 hrs	40 marks 5 marks
PRACTICAL- II Advanced Numerical Analysis Viva voce	3 hrs	40 marks 5 marks
Journal		10 marks
Total marks		100 marks

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
PMB-401 : Microbiology Practical- IV

RATIONALE: This course is designed to enable students to acquire basic understanding of the microbiological physiology and nutrition and its metabolic diversity and related to medical microbiology.

LEARNING OUTCOMES:

- Understand the concept of nutrition of the bacteria.
- Develop an understanding of the growth and various parameters affecting to the growth.
- Gain knowledge about the microbial control and their inhibition..
- Gain knowledge about pathogenic organisms.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. General viva-voce will be conducted to analyze the knowledge of the student.

Subject Code	Subject Title	Credits	Practical		Total Marks
			Hrs.	Max Marks	
PMB- 401	Microbiology Practical IV	3	6	100	100

LIST OF EXPERIMENTS

1. Carbohydrate metabolism test: Sugar fermentation test, M-R test,V-P test, Citrate utilization test, TSI test,
2. Nitrogen Utilization test: Indole,H_2S, Phenyl alanine, Ammonia
3. Enzyme detection test: Amylase, Protease, lipase catalase, urease nitrate reductase, oxidase, Dehydrogenase, gelatinase, Deaminase, Decarboxylase
4. Estimation of activity of enzymes like amylase , acid phosphatase
5. Effect of pH on enzyme activity.
6. Effect of temperature on enzyme activity.
7. Effect of substrate concentration on enzyme activity.
8. Effect of enzyme concentration on enzyme activity
9. Examination of urine – Physical, chemical, microscopic and bacteriological.
10. Isolation and Identification of Yeast
11. Isolation and Identification of Fungi
12. Antibiotic sensitivity test by disc diffusion/ Cup Borer Method technique.
13. Isolation of antibiotic resistant mutants by gradient plate technique.
14. Isolation of Streptomycin resistant mutant by Replica plate method.

B.Sc. MICROBILOGY Semester IV, PMB-401
Practical Examination Skeleton

TIME : 10 TO 5 **TOTAL MARKS 100**

EX 1 Write the Principle and Working of Instrument
5

(A) Microscope
(B) Autoclave
(C) Hot Air oven
(D) Incubator
(E) Centrifuge
(F) pH meter
(G) Spectrophotometer

EX 2 Write the Principle, Requirement and Procedure for the given experiment and perform
20

(A) Isolation and Identification of Yeast
(B) Isolation and Identification of Fungi
(C) Antibiotic sensitivity test by disc diffusion/ Cup borer technique.
(D) Isolation of antibiotic resistant mutants by gradient plate technique.
(E) Isolation of Streptomycin resistant mutant by Replica plate method.

EX 3 Write the Principle , Requirement and Procedure for the given experiment and perform
20

(A) To Perform the various Carbohydrate metabolism test
(B) To Perform the various Nitrogen Utilization test
(C) To Perform the various Enzyme detection test

EX 4 Write the Principle , Requirement and Procedure for the given experiment and perform
20

(A) Estimation of activity of amylase
(B) Effect of pH on enzyme activity.
(C) Effect of temperature on enzyme activity.
(D) Effect of substrate concentration on enzyme activity.
(E) Effect of incubation on enzyme activity.
(F) Examination of urine – Physical, chemical, microscopic and bacteriological.

Ex 5 Spotting **10**

EX 6 Viva **15**

EX 7 Journal and Slide Box **10**

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)

EGC 401 SOCIAL SERVICE SCHEME- II

RATIONALE: This course is designed to enable students to acquire the core concept of importance of National service scheme.

LEARNING OUTCOMES: The main objective is to ensure that students learn the essential concepts of NSS and its role in society. The base functions of NSS like organizing, controlling, guiding ,leading as a young citizen of country to handle any crucial societal or natural sizzling problems.

Subject Code	Subject Title	Credits	Theory/Practical				Total Marks
			Hrs.	Max Marks			
				Mid Term Theory	Mid Term Practical	End Term	
EGC 401	Social Service Scheme – II	2	36	20	30	--	50

OBJECTIVES

1. Develop a sense of social and civic responsibility
2. Being human, acquire leadership capacity to get rid form Emergencies And Natural Disasters
3. Involve students for community services that leads them to be a responsible citizen of India
4. Generate Required Competence For Group-Living And Sharing Of Responsibilities

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students in written examination, but also to motivate them for better performance as a citizen of country. Students are evaluated on the basis of Internal Examination conducted by College and on basis of their project work performances as mentioned in examination scheme. Area of project work will be related to their course content.

Mid Term Examination Scheme (Only Internal Evaluation) : Total Marks - 50

Internal Theory:20 Marks (One internal exam of 40 marks is to be conduced : 40/2=20 Marks)
Field Work : 20 Marks
Assignment / Report : 10 Marks

Internal Theory Examination Structure

Q : 1	**Answer all questions each question carry 1 (one) mark.** **(Either from Theory / Practical)** • Short Questions / Multiple Choice Questions / Fill in the Blanks • True / False / Definition / Expand	10 Marks
Q : 2	**Attempt Any 6 out of 8** (Short Note or Descriptive Questions)	30 Marks
	Total	**40 Marks**

KADI SARVA VISHWAVIDYALAYA
B.Sc Semester IV Syllabus (W.E.F. June 2018)
COURSE CONTENT:

UNIT NO	TITLE OF UNIT AND DETAILS	HOURS	WEIGHTAGE In %
1.	**Youth & NSS** • Role of youth in NSS • Issues of youth today • Challenges and opportunities of youth • Youth- adult partnership	06	**20%**
2.	**Importance and role of Youth leadership** • Definition of youth leadership • Concepts of youth leadership and volunteerism • Role of youth in nation building • Decision power and problem solving approach of youth	10	**40%**
3.	**Social Service Projects** • Projects for social service (Heath checkup camp, Water management, Waste management, Environment Management, Cultural awareness through celebrating various related events, Old age home and orphan home visit etc.,)	08	**40%**

KADI SARVA VISHWAVIDYALAYA, GANDHINAGAR

B.Sc. Semester III / IV, End Term Examination,

Month-Year

Subject: Code-Title

Time: 3 hrs **Date** **Maximum marks: 70**

Que. No : 1	(A) : Write any Two out of Three Questions (B) : Write any One out of Two Questions	12 Marks 08 Marks
Que. No : 2	(A) : Write any Two out of Three Questions (B) : Write any One out of Two Questions	12 Marks 08 Marks
Que. No : 3	(A) : Write any Two out of Three Questions (B) : Write any One out of Two Questions	12 Marks 08 Marks
Que. No : 4	Write any Ten out of Twelve (Four questions to be asked from each unit) Short question/MCQ/Short numerical/Diagram	10 Marks
Total marks		70 marks