

Punyashlok Ahilyadevi Holkar Solapur University, Solapur



NAAC Accredited-2015
'B' Grade (CGPA 2.62)

Name of the Faculty: Science & Technology

Choice Based Credit System

Syllabus: Entrepreneurship

Name of the Course: B.Sc. II (Sem.– III & IV)

(Syllabus to be implemented from w.e.f. June 2020)

Subject/ Core Course	Name and Type of the Paper		No. of papers/ Practical	Hrs/week			Total Marks Per Paper	UA	CA	Credits
	Type	Name		L	T	P				
Class :	B.Sc.- II Semester – III									
Core (*Students can opt any Three subjects among the Four	C-5	Paper-V Principles of Business Management & Business Organization	3.0	--	--	50	40	10	4.0	
of Three Subjects offered One		Paper-VI Advanced Accountancy & Auditing	3.0	--	--	50	40	10		
Subject will be the Core Subject OR	C-6	Paper-V Analytical and Industrial Aspects of Inorganic Chemistry	3.0	--	--	50	40	10	4.0	
Subject will be the Core Subject OR		Paper-VI Analytical and Industrial Aspects of Organic Chemistry	3.0	--	--	50	40	10		
	C-7	Paper-V Genetics	3.0	--	--	50	40	10	4.0	
		Paper-VI Fermentation Technology	3.0	--	--	50	40	10		
	SEC-1									
	GE-3									
Grand Total			18	--	--	300	240	60	12	
Class :	B.Sc.- II Semester – IV									
Core (*Students can opt any Three subjects among the Four Subjects offered at B.Sc.I. Out of Three Subjects offered One Subject will be the Core Subject OR Students can opt any Two subjects among the Four Subjects offered at B.Sc.I. Out of Two Subjects One Subject will be the Core Subject and any One Subject among the other will be Elective Subject	C-8	Paper-VII Corporate Accounting & Professional Ethics	3.0	--	--	50	40	10	4.0	
		Paper-VIII International Marketing & Marketing Decision	3.0	--	--	50	40	10		
	C-9	Paper-VII Analytical and Industrial Aspects of Physical Chemistry	3.0	--	--	50	40	10	4.0	
		Paper-VIII Industrial Aspects of Applied Chemistry	3.0	--	--	50	40	10		
	C-10	Paper-VII Molecular Biology	3.0	--	--	50	40	10	4.0	
		Paper-VIII Food & Dairy Technology	3.0	--	--	50	40	10		
	SEC-2									
	GE-4									
	Environmental Studies		3.0	--	--	50	40	10	NC	
Total (Theory)			21	--	--	350	280	70	12	
Practical	C-5 & C-8	Entrepreneurship Pr. III&IV	--	--	8	100	80	20	4.0	
	C-6 & C-9	Industrial Chemistry Pr. III&IV	--	--	8	100	80	20	4.0	
	C-7 & C-10	Microbial Biotechnology Pr. III&IV	--	--	8	100	80	20	4.0	
	GE-3 & GE-4									
Total (Practical)					24	300	240	60	12	
Grand Total			39		24	950	760	190	36	

General Guidelines for Choice Based Credit System (CBCS)

B.Sc. II Entrepreneurship- Details Course structure - w. e. f.2020-21

1. The University follows Semester system
2. An academic year shall consist of two semesters
3. Each B.Sc. course shall consist of three years i.e. six semesters
4. Environmental Studies paper shall remain compulsory for B. Sc .Part- II students in IVth Sem.
4. B.Sc. Part-II shall consist of two semesters: Semester III and Semester IV.

In semester –III, there will be two theory papers of 50 marks for each subject. There shall be three optional science subjects. Similarly, in semester –IV there will be two theory papers of 50 marks for each subject. There shall be three optional science subjects and Environmental Studies paper compulsory for every student in semester IV.

The scheme of evaluation of performance of candidates shall be based on University assessment as well as College internal assessment as given below. For B.Sc. Part II Sem. III & IV the internal assessment will be based on Unit tests, Home assignment, viva, practicals, Project Work etc as given below. Practical course examination of 100 marks for each subject shall be conducted at the end of IVth semester. The practical examination of 100 marks shall also consist of 80 marks for University practical assessment and 20 marks for college internal assessment.

The process of evaluation for Environmental Studies shall be based on University theory examination of 40 marks and 10 marks internal assessment. The internal assessment for environmental studies shall be based on internal test/ home assignment/tutorial/project report of 10 marks.

For University practical examination out of two examiners, one examiner will be internal and another examiner will be External. Both examiners will be appointed by the University. The internal practical assessment shall be done as per scheme given below.

5. Scheme of evaluation:

As per the norms of the grading system of evaluation, out of 50 Marks, the candidate has to appear for College internal assessment of 10 marks and external evaluation (University Assessment) of 40 marks. The respective B.O.S. may decide the nature of College internal Assessment after referring to the scheme given below or may be used as it is.

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

B.Sc. II-Entrepreneurship CBCS PATTERN

w.e.f. 2020-21

Semester-III

Entrepreneurship

Paper-V- Principles of Business Management & Business Organization

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: -Business Management

9

Definition, Nature and Importance, function, Managerial Process and roles of manager
School of management & F.W. Taylor, Henry Fayola, Charles Babej, Peter Ducker, Mary
Parker, Follett, Elton Mayo.

Unit II: -Business Planning & Decision making

9

Meaning & definition, Planning Process, Types of Planning, Features of Planning,
Meaning & Definition, Decision making Process, Types of Decision, nature of
decision and strategic decision.

Unit III: - Business Organization

9

Meaning & definition, Characteristics and Importance of organization, Types of Organization-
Staff and line organization, Structure of organization – Horizontal and Vertical.

Unit IV: -Direction, staffing & Controlling

9

Meaning & definition, Characteristics and Importance of Direction, Methods of Staffing, Staff
training and appraisal system, Definition of control, types of control steps in control need for
control

Unit V: -Leadership and Motivation

9

Meaning & definition of motivation, Importance of motivation, Theory of motivation, Herzberg
two factor theory, theory X, Y&Z, financial and non financial incentives
Leadership: - Meaning, Importance, Functions and qualities of leader, Managerial grid and
leadership style

Reference Books:-

- Business Management – T. Ramaswamy
- Management – Stephen P. Robbins & Marry Cowler
- Modern management Practices – Dr. A.K.Gavai
- Principles and Practices of Management – Amrita Singh
- Business Organization and Management- B.P.Singh &T.N Chhabr

Entrepreneurship
Paper-VI- Advanced Accountancy & Auditing

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: Financial Accounting with Tally: 10

Company creation, Ledger creation, Accounts configuration, Accounts classification, Accounts Master Creation, Voucher Types and Classes, Accounts vouchers
VAT (Value Added Tax) Introduction, Overview of GST

Unit II: Final Account & Insurance Claims 08

Bank, Bank reconciliation statement, Loss of Stock and Loss of Profit by Fire.

Unit III: Fund flow & Cash flow Statement 08

Statement of Changes in Financial, Position on Cash Basis and on Working Capital Basis.

Unit IV: Auditing 09

Meaning, nature, scope and objectives, Types of Audit – Internal Audit and External Audit, Internal Check Appointment, Qualifications, Disqualifications, Removal and Remuneration of an Auditor of a Limited Company; Statutory Audit Report.

Unit V: Vouching 10

Meaning, need and importance, vouching of cash and Credit transactions, Verification and Valuation of Assets and Liabilities, Special features in respect of Audit of Co-operative Societies, Bank, and Charitable Trust and Institutions.

Reference Books:

1. Advanced Accountancy – Shukla and Gerewal.
2. Steps in Advanced Accountancy – Maheshwari.
3. Principles of Management Accounting – Manmohan Goyal.
4. Management Accounting – Haneef Mukharji.
5. Financial Accounting - Haneef Mukharji.
6. Tally. ERP 9(Training Guide) Ashok K. Nandani
7. Tally 9 -Vishnu Priya Shing
8. Practical Auditing – B.N. Tandon.
9. Principles of Auditing – De Paula.
10. Principles and practice - Saxena

Industrial Chemistry

Paper-V- Analytical and Industrial Aspects of Inorganic Chemistry

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: Theory of Volumetric analysis: 9

1. Introduction, Terminology: - Titrant, Titrand, standard solution, Titration, Indicator, Equivalence point, End point, Primary standard, Secondary standard.
2. Theory of Acid-Base indicator:
 - A .Colour change Interval
 - B.Theories-Ostwald's theory & Quinoid theory,
3. Neutralization curve and choice of indicator for following titrations:
 - A) Strong acid and Strong Base
 - B) Strong Acid and Weak Base
 - C) Weak Acid and Strong Base
4. Complexometric titration:
 - A. General account,
 - B. Types of EDTA Titrations (in detail direct titration) ,
 - C. Metallochromic Indicator w.r.t. Eriochrome Black-T

Unit II: Theory of Gravimetric Analysis: 9

1. Introduction
2. Precipitation – Conditions of Precipitation, Physical nature of Precipitate.
3. Process of precipitation – i) Nucleation ii) Crystal growth iii) Digestion
4. Co precipitation and Post precipitation
5. Role of Organic precipitants in gravimetric analysis –
 - i) DMG
 - ii) Aluminon
 - iii) 8- hydroxy quinoline.

Unit III: Catalysis: 9

1. Introduction
2. Classification of catalytic reactions: Homogeneous & Heterogeneous.
3. Types of catalysis
4. Characteristics of catalytic reactions
5. Mechanism of catalysis: i) Intermediate compound theory ii) Adsorption theory.
6. Industrial applications of catalysis

Unit IV: Manufacture of Industrial Heavy Chemicals: 9

1. Introduction definition of heavy chemicals
2. Physicochemical Principles & manufacture of following:
 - a. Ammonia by Haber process.
 - b. Sulphuric acid by contact process.
 - c. Sodium carbonate by Solvay process.

1. Corrosion:-

- a. Introduction, with types of corrosion.
- b. Electrochemical theory of corrosion.
- c. Factors affecting the corrosion: i) Position of metal in emf series. ii) Purity of metal
iii) Effect of moisture. iv) Effect of oxygen. v) Hydrogen over voltage
- d. Methods of protection of metals from corrosion.

2. Passivity:-a. Definition. b.Types of passivity. c.Oxide film theory. d. Application of passivity.

Reference Books:

1. Advanced Inorganic Chemistry by Satyaprakash, Tuli, Basu (S. Chand and Co.)
2. Inorganic Chemistry by Puri and Sharma (S. Chand & Co.)
3. University General Chemistry by CNR Rao (McMillan)
4. Industrial Chemistry by B.K. Sharma.
5. Environmental Chemistry by S.M. Khopkar (Wiley Eastern Ltd.)
6. Inorganic Chemistry by D.E. Shriver, P.W. Atkins and C.H. Longford, Oxford.
7. Environmental chemistry by B.K. Sharma.
8. Text book of Quantitative Inorganic Analysis by A.I. Vogel.
9. Vogel's Text Book of Quantative Inorganic Analysis – Bassett, Denny, Jefferyy
Mendham.
10. Basic concepts of Analytical Chemistry by S.M. Khopkar.

Industrial Chemistry

Paper-VI- Analytical and Industrial Aspects of Organic Chemistry

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: Soaps and Detergents: 9

1. Soap:

- i) Raw materials.
- ii) Types of soaps.
- iii) Manufacture of soap - Hot process.
- iv) Cleansing action of soaps.

2. Detergents:

- i) Raw materials.
- ii) Types of detergents - Cationic, anionic, amphoteric, neutral detergents.
- iii) Preparation of teepol and deriphat.

3. Comparison between soaps and detergents.

Unit II: Sugar and Alcohol Industry: 10

- 1 Manufacture of raw cane sugar.
- 2 Refining of raw sugar.
- 3 White sugar.
- 4 By-products of sugar industry.
 - A Manufacture of ethyl alcohol from molasses
 - B Rectified spirit, denatured spirit absolute alcohol and power alcohol.
 - C By-products of alcohol industry.

Unit III: Textile chemistry: 10

- 1 Introduction, classification of fibers.
- 2 Sizing:
 - i) object of sizing, sizing ingredients and their functions.
 - ii) General idea of properties of starch, softeners, synthetic adhesives.
- 3 Bleaching:
 - i) Brief study of the outline of the process of bleaching cotton and synthetic material.
 - ii) General idea of processes like singeing, desizing, scouring.
- 4 Dyeing: Study of dyeing of cellulosic material and synthetic fibers with dye like direct, vat, reactive and disperse dyes.

Unit IV: Drugs: Synthesis and Applications: 9

- i) Antimalerials - Paludrin.
- ii) Antituberculars - Isoniazide and Ethambutol.
- iii) C. N. S. drugs - Phenobarbitone.
- iv) Antidiabetic - Tolbutamide.
- v) Anti-inflammatory drugs - Ibuprofen.
- vi) Antibiotic - Chloromycetin.

Unit V: Agrochemicals.

7

General idea of agrochemicals including pyrethroids.

Synthesis and uses of the following agrochemicals :

- i) Indole-3-acetic acid.
- ii) Monocrotophos.
- iii) Methoxychlor.
- iv) Ethopphan.
- v) Carbaryl.

Reference Books:

1. Organic Chemistry - R. T. Morrison and R. N. Boyd Prentice Hall of India Private limited New Delhi. 6th Edition.
2. A text book of Organic Chemistry - Arun Bahl and B. S. Bahl S. Chand and Company Ltd. 6th Edition.
3. Chemicals for crop improvement and pest management - Green, Hartly and West.
4. Chemistry of pesticides - K. H. Buchel (T. W.).
5. Medical Chemistry - Burger.
6. Basic Concepts of Analytical Chemistry - S. M. Khopkar, Wiley Eastern Ltd. Bombay.
7. Industrial Chemistry - R. K. Das, Asia Publishing, Mumbai.
8. Quantitative Organic Chemistry - A. I. Vogel, Pearson Edn. Delhi.
9. Medical Chemistry - A. Burger, John Wiley, New York.
10. Biotechnology and Applied Microbiology - Alani and Moo-Young.
11. Green Chemistry: Environment Friendly alternatives - Rashmi Sanghi and M.M. Srivastava (Eds) (c) 2003 Narosa Publishing House, New Delhi, India.
12. Textile science - J. T. Marsh

Microbial Biotechnology

Paper-V- Genetics

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I **08**

Mendelian genetic- Introduction, Mendel's experiment, Monohybrid and Dihybrid crosses, Genotypic and phenotypic ratio, Law of Dominance, Law of Independent assortment, Law of Co-dominance and Incomplete dominance.

Unit II **10**

Chromosome - Structure of Chromosome and Types of chromosome.

Chromosomal aberration Translocations, inversions, deletions and duplications.

Mutation- Definition, Mutagenic agent, Induced and Spontaneous mutation.

Unit III **06**

Gene transfer

Recombination, Transformation, Conjugation, Transduction, Fate of exogenote,

Unit IV **09**

Linkage: Introduction, types, phases linkage group detection of linkage significance

Crossing over: features, theories types, factors affecting crossing over.

Unit V **12**

Transposable elements: -definition, types.

Gene Interaction and epistasis:-Types of gene interactions.

Biostatistics :Introduction, Mean, Mode, Median, Probability, Null hypothesis, Chi-Square test, T test X2 test, Probability level and problems.

REFERENCES:

1. Bergey's Manual of Determinative Bacteriology- Breed and Buchanan
2. General microbiology – Stanier
3. General microbiology – Pawar and Daginawala Vol I and II
4. Introduction of Biostatics.
5. Molecular Biology of Gene – J.D. Watson
6. Recombinant DNA – J.D. Watson
7. Microbiology - Davis

Microbial Biotechnology

Paper-VI- Fermentation Technology

Total Marks: 50 (40+10)

Credits -4

Contacts hours:45

Unit I

08

Industrial Production of Antibiotics:-

Classification and Types of Antibiotics, Industrial Production of Penicillin & Streptomycin

Unit II

Industrial production of Alcoholic Beverages: -

09

Alcohol production from molasses, Beer Production from Barley Malt, Wine Production from grapes.

Unit III:

10

Industrial production of Enzymes-Amylase, **Organic acid-** Citric Acid **Amino acid-** L-Lysine, **Vitamin-** Vit. B₁₂ (Micro-organisms involved, production media, fermentation conditions, product recovery and applications)

Unit IV

10

Production - Single Cell Proteins

Production of Bioinsecticides: - *Bacillus thuriangiensis*.

Biofertilizer production: - *Azotobacter* and *Rhizobium*

Unit V

08

Industrial Useful Product:-Biogas production, Biofuel production

Biopolymer Production- PHB and PHA

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B.Sc.II-Entrepreneurship CBCS PATTERN

w.e.f. 2017-18

Semester-IV

Entrepreneurship

Paper-VII- Corporate Accounting & Professional Ethics

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: Issue and forfeiture of Shares

09

Issue and forfeiture of Shares, Reissue of Forfeited Shares, Valuation of Shares Valuation of Shares – Intrinsic Value Method, Market & Fair Value Method.

Unit II: Final Accounts of Companies

09

Preparation of Final Accounts of Companies in vertical form as per the Provisions of Schedule VI to the Indian Companies Act, 1956.

Unit III: Liquidation of Companies

06

Accounting for liquidation of Companies – Preparation of Liquidator's Final Statement of Account.

Unit IV: Concept and Theories of Ethics & Corporate Governance

12

Meaning & Definition, Personal & Business Ethics, Morality, Etiquette & Professional codes
Meaning & Definition of Corporate Governance, Corporate culture, corporate social responsibility, creating ethical organization, code of conduct.

Unit V: Globalization & Functional Areas of Ethics

09

Global Corporation, Factors Facilitating Globalization, Role of MNC, Marketing Ethics, Ethics in -HRM, Financial management, IT etc.

Reference Books:

- ❖ Business Ethics – A.C.Fernando Pearson
- ❖ Business Ethics – Dr. A.K.Gavai, Himalaya.
- ❖ Advanced Accountancy by M.C. Shukla, T.S. Grewal & S.C. Gupta
- ❖ Corporate Accounting by S. N. Maheshwari
- ❖ Advanced Accounting by H. Chakra borty
- ❖ Advance Accounting by Jain Narang

Entrepreneurship

Paper-VIII- International Marketing & Marketing Decision

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: - Designing Product **08**

Product Planning & Development, Product Life cycle, Product idea & its process, Product Positioning – Element of positioning, Segmentation & Targeting, Types of Product- commodity product, technology product, customized product, Product line & product mix, Brand Management.

Unit II: -Pricing & Distribution **12**

Definition, price decision and its objectives, Factors influence price decision, Methods of pricing, information needed for pricing, price sensitivity & price war
Types of Distribution Channel, Channel Strategy,
Whole sellers – Types & Function, Retailer – Meaning & Forms- supermarket and hyper market, Physical Distribution, Marketing communication, Sales promotion, sponsorship & Exhibitions, Defining advertising strategy in competitive market, public relation and publicity

Unit III: -Consumer Behavior **08**

Meaning of consumer behavior, Determinants of consumer behavior, Need of buyer, Models of behavior, buying process & Customer loyalty.

Unit IV: -Introduction to Global Marketing & Global marketing Environment **09**

Market Selection, Emergence of Global Marketing, Use of website in marketing, Global Brand and Multinational Company, Economic, Social, political and Government, competition environment, Technology Environment.

Unit V: - New Trends in Marketing **08**

Foreign Trade – steps involved in import & Export Internet marketing, E- commerce, E- marketing.

Reference Books:-

1. Marketing Management- V S Ramaswamy & S Namakumari
2. Marketing Management- Arun Kumar & N Minakshi
3. Global Marketing – S.A.Sherlekar & V.S.Sherlekar
4. International marketing- Fransis Cherunitarn

Industrial Chemistry

Paper-VII- Analytical and Industrial Aspects of Physical Chemistry

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: Electrochemistry:

10

1. Introduction, conduction of electricity, Types of conductors: electronic and electrolytic.
2. Explanation of terms: Conductance, Specific resistance, specific conductance, Equivalent conductance, Molecular conductance.
3. Variation of specific and equivalent conductance with concentration, Equivalent conductance at infinite dilution (Mention Onsager equation, $\lambda_v = \lambda_\infty - b\sqrt{c}$ graph)
4. Migration of ions, Hittorf's rule, Transport number, Determination of transport number by moving boundary method, factors influencing transport number: Nature of electrolyte, concentration, temperature, complex formation and Degree of hydration.
5. Definition of p^H and p^{OH} , buffer solution, types of buffer, pH of buffers: Henderson's equation for acidic and basic buffers. (Derivation is not expected.)
6. Numerical problems.

Unit II: Potentiometry:

09

1. Introduction.
2. Detail study of calomel, quinhydrone and glass electrodes and their use in determination of pH.
3. Potentiometric titrations: Classical and analytical methods for locating end points, Advantages of potentiometric titrations,
 - i) Acid - Base titrations.
 - ii) Redox - titrations.
 - iii) Precipitation titrations.
4. Basic circuit of direct reading potentiometer.

Unit III: Conductometry:

09

1. Measurement of conductance by Wheatstone bridge, Basic circuit of D.C. Wheatstone Bridge, use of alternating current, conductivity water, Different types of conductivity cells, cell constant and its determination. Experimental determination of specific, equivalent and molecular conductances.
2. Conductometric acid-base titrations
 - i. Strong acid against strong base
 - ii. Strong acid against weak base
 - iii. Weak acid against strong base.
 - iv. Weak acid against weak base.

Unit IV Colourimetry:**08**

1. Introduction.
2. General discussion of theory of colorimetry : Lambert law, Beer's law (Derivation not expected), Terms used in Colorimetry, Application of Beer's law, Deviation from Beer's law.
3. Classification of methods of 'colour' measurement or comparison, Photoelectric photometer method - single cell photo-electric colorimeter.

Unit V: Flame Photometry:**09**

1. General principles.
2. Instrumentation: Block diagram, Burners: Total consumption burner, premix or laminar-flow burner, Lundergraph burner, Mirrors, Slits, Monochromators, Filters and Detectors.
3. Applications in qualitative and quantitative analysis.
4. Limitations of flame photometry

Reference Books:

1. Text book of Quantitative Inorganic Analysis - By A. I. Vogel (ELBS and Longman 3rd Edition).
2. Instrumental methods of Chemical analysis by Willard, Merit and Dean.
 3. Instrumental methods of Chemical analysis by Chatwal and Anand (Himalaya Publication).
4. Principles of electroplating and eletroforming by Blum and Hogaboom, Mac Graw - Hill Book Co. 3rd Edn.
5. Vogel's text book of Quantitative Inorganic Analysis by Bassett and Denny etc. ELBS and Longman 4th Edition.
6. Principles of Physical Chemistry by Puri, Sharma, Pathania, Shobhanlal Naginchand and Company, Jalandar.
7. Text Book of Physical Chemistry by S. Glasstone, Macmillan India Ltd.
8. Elements of Physical Chemistry by D. Lewis and S. Glasstone (Macmillan).
9. An Introduction to Electrochemistry by S. Glasstone.
10. Physical Chemistry by W. J. Moore.

Industrial Chemistry

Paper-VIII- Industrial Aspects of Applied Chemistry

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: Metallurgy: Iron and Steel. 12

1 Introduction: - Terms used in Metallurgy, Metallurgy, Mineral, Ore, Gangue, Flux, Slag

2 Occurrence of metals: Types of Ores.

3 Steps Involved in Metallurgical Processes:

A) Concentration of Ores:

i) Physical Methods:-

a) Gravity separation method, b) Magnetic separation method, c) Froth floatation method.

ii) Chemical Methods:

a) Calcinations b) Roasting

B) Reduction: Mention various methods of reduction. Extraction of Iron by blast furnace

C). Types of steel and its alloys.

1. Manufacture of Steel – a) Bessemer process b) L. D. Process

2. Heat treatment on steel.

Unit II: Electroplating: 09

1. Introduction.

2. Electrolysis, Faraday's laws, Cathode current efficiency.

3. Basic principles of electroplating, cleaning of articles.

4. Electroplating of Nickel and Chromium.

5. Anodizing.

Unit III: Fertilizers: 09

1. Classification of fertilizers.

2. Qualities of an ideal fertilizer.

3. Manufacture of Common fertilizers such as:

a. Ammonium sulphate

b. Urea

c. Super phosphate and

d. Triple super phosphate

e. Potassium fertilizers

4. Pollution caused by fertilizers.

Unit IV: Glass Materials:**08**

1. Raw materials
2. Manufacturing methods:
 - Pot furnace
 - Tank furnace
3. Types of Glass: a. commercial Glass, b. Special glass and c. Colored glass.

Unit V: Ceramic Materials:**07**

1. Introduction
2. Classification
3. Properties of ceramics
4. Cement : Types of cements and their applications
5. Manufacture of Portland cement by wet process.

Reference Books:

1. Principles of electroplating and electroforming by Blum and Hogaboom, Mac Graw - Hill Book Co. 3rd Edn.
2. Vogel's text book of Quantitative Inorganic Analysis by Bassett and Denny etc. ELBS and Longman 4th Edition.
3. Elements of Physical Chemistry by D. Lewis and S. Glasstone (Macmillan).
4. Principles of Physical Chemistry by Maron and Lando (Amerind).
5. An Introduction to Electrochemistry by S. Glasstone. Advanced Inorganic Chemistry by Satyaprakash, Tuli, Basu (S. Chand and Co.).
6. Inorganic Chemistry by G.S. Manku Tata Mc. Graw Hill.
7. University General Chemistry by CNR Rao (McMillan).
8. Industrial Chemistry by B.K. Sharma.
9. Environmental Chemistry by S.M. Khopkar (Wiley Eastern Ltd.)
10. Industrial Chemistry: R K Das.

Microbial Biotechnology

Paper-VII- Molecular Biology

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I

09

Central Dogma

DNA structure; Salient features of double helix; Types of DNA, the Central Dogma, Genetic code – evidences and properties.

Unit II

09

DNA replication- Definition, Enzyme involved in Replication, DNA Polymerases Replication in Prokaryotic Cell & Eukaryotic Cell, Rolling Circle Model

Unit III

10

Transcription- In Prokaryotic Cell & Eukaryotic Cell, RNA Polymerases, Post transcriptional modification

Translation

Unit IV

09

Gene Regulation in Prokaryotes:

Principles of transcriptional regulation; Operon concept; Repression and Induction of genes; Regulation of Operon: Lac Operon and Trp Operon.

Unit-V

08

DNA Repair Mechanism-

Direct repair, Excision repair, Mismatch repair, SOS repair

Reference Books:

Advances in Biotechnology – S.W. Jogdand.

Textbook of Biotechnology – R.C. Dubey.

Biotechnology – B.D. Singh.

Gene VII; Benjamin Lewin; Pearson Education.

Molecular Biology; R. Weaver; 2nd Edition, McGraw Hill.

Microbial Biotechnology

Paper-VIII- Food & Dairy Technology

Total Marks: 50 (40+10)

Credits -4

Contacts hours: 45

Unit I: Food & Dairy Microbiology

10

Microbiology of Food and milk, Microbial Examination of milk & food. Dye reduction tests- MBRT, Resazurin Test, Pasteurization of milk -Methods of Pasteurization – LTH, HTST, and UHT. Phosphatase test for determination of efficiency of Pasteurization. Chemical and Physical properties of food affecting microbial growth (intrinsic and extrinsic factors).

Unit II Dairy Technology

10

Introduction- Dairy technology, Definition of milk, factors involved in milk contamination, Manufacturing, packaging and storage of pasteurized milk, Homogenized milk, flavored milk, Tanned milk.

Unit III

7

Cream: Definition, composition food & nutritive value, production and uses.

Butter: Introduction, definition, classification, composition, defect of butter uses.

Unit IV

8

Cheese: Introduction, definition, history, composition and types, manufacturer of cheese & its uses.

Ice Cream: Introduction, definition, composition, method of manufacture, packing, hardening, storage, uses.

Unit V Food Technology

10

Food as substrate for microorganism, Microbial Spoilage of meat and meat product, fish & poultry foods, fruits & vegetable, General principles and different method of Preservation of food, Canned food, process of canning of food, microbial food poisoning.

REFERENCE BOOKS:

- 1) Food Microbiology (1995)-Adams M.R.and Moss, M.O., New Age International Limited.
- 2) Food Microbiology –Frazier, W.C., Westhoff, D.C. IVth edition, Tata McGraw Hill Publisher.
- 3) Industrial Microbiology by A. H. Patel, Mac Millan India Pvt. Ltd.
- 4) Modern Food Microbiology VIth edition- James M Jay. An Aspen publication.
- 5) Applied Dairy Microbiology –Elmer Marth and James Steele 2nd edition, publisher Marcel Dekker Inc.
6. Dairy Technology – Sukumar De
7. Industrial Microbiology – Prescott and Dunn
9. Industrial Microbiology – Casida

SYLLABUS FOR LAB COURSES

Entrepreneurship

Pr. III & IV

Based on C5 & C8

(8 periods, per week / batch)

Total marks 100(80+20)

1. Practical Related to UNIT- I & II in Marketing
 2. Collection of Newspaper / Magazine cuttings related to Management.
 3. Prepare a Study Plan for academic year.
 4. A study of Organization Structure of any Organization.
 5. Preparation of a organization chart.
 6. Study of selection process of any organization.
 7. A study of buying behavior for any organization.
 8. Design marketing research plan.
 9. A study of product life cycle of any product.
 10. A study of marketing channel of any company.
 11. A visit to export unit and prepare a report.
 12. Share Market study
 13. Preparation of Final account of Company & Bank
 14. Exercise on holding company
 15. Draw a gateway of tally menu
 16. Generalized Entries and Display Balance sheet, Cash and Bank Ledger
 17. Problem based on Tally practical
- Practical (visit report)**
- 15) Plant and machineries in organization.
 - 16) Working efficiency of organization.
 - 17) Quality control & management.

INDUSTRIAL CHEMISTRY

Sem.III & IV

Pr. III & IV

Based on C6 & C9

(8 periods, per week / batch)

Total marks 100(80+20)

A Volumetric Experiments:

1. Prepare 0.1N Standard solution of $K_2Cr_2O_7$. Standardize the given FAS solution using prepared Potassium dichromate solution.
2. Determine the percentage of Nitrogen in the given sample of nitrogenous fertilizer (Urea or Ammonium Sulphate).
3. To investigate the adsorption of oxalic acid or Acetic acid from aqueous solution by activated charcoal and examine the validity of Freundlich and Longmuir isotherms.
4. Estimation of copper from brass by using standard sodium thiosulphate solution.
5. Estimation of zinc in brass solution.
6. Estimation of aspirin (acetyl salicylic acid).
7. Estimation of ethyl benzoate.
8. Estimation of sucrose.
9. Determine the COD of given water sample.
10. Determine the BOD of the given water sample.
11. Analysis of commercial vinegar.

B Preparations:

1. Preparation of benzoic acid from benzamide.
2. Preparation of methyl orange.
3. Laboratory preparation of soap.
4. Preparation of Ferrous ammonium sulphate from ferrous sulphate.
5. Preparation of p-Bromo acetanilide from given acetanilide.
6. Preparation of tetra amine copper (II) sulphate from copper sulphate.
7. Preparation of phthalimide from phthalic anhydride.

C Gravimetric Analysis:

1. Determine the amount of Fe as a Fe_2O_3 from the given solution of FAS and sulphuric acid, gravimetrically.
2. Determine the amount of Ba as a $BaSO_4$ from the given solution of barium chloride and free hydrochloric acid gravimetrically.
3. Estimation of rate of corrosion of aluminium in acidic and basic medium.

D Instrumental Analysis:

1. Verify the Ostwald's dilution law for weak acid conductometrically.
2. Strong acid strong base Conductometric titration.
3. Determination of pH of the buffer solutions potentiometrically.
4. Determination of dissociation constant of weak acid pHmetrically.
5. Verify the Beers - Lamberts law for copper solution and determine the concentration of given copper sample.

**MICROBIAL
TECHNOLOGY
Pr. III & IV
Based on C7 & C10**

(8 periods, per week / batch)

Total marks 100(80+20)

- 1) Karyotypes analysis
- 2) Isolation of plasmid DNA
- 3) Isolation of Genomic DNA
- 4) Isolation of Plant DNA
- 5) Analysis for chi square test.
- 6) Study of bacterial conjugation.
- 7) Calculate mean, mode and median of the any sample.
- 8) Separation of plasmid DNA
- 9) Problem based on Mendelian genetics
 - Law of dominance
 - Law of Segregation
 - Law of Independent Assortment
- 10) Isolation of Mutants
- 11) Isolation of Bacteriophage
- 12) Determination of fat from the given sample of milk.
- 13) Determination of the casein proteins from the milk sample.
- 14) Determination of sugar from the milk sample.
- 15) Determination of benzoate or sorbet content of food.
- 16) MBRT Test. & Phosphates test
- 17) MPN of milk.
- 18) Isolation and identification of *Salmonella* group of microorganism from milk/food.
- 19) Production of Amylase enzyme by using *Bacillus species*
- 20) Production of beer
- 21) Isolation antibiotic producing microorganism from soil sample.
- 22) Production of Biofertilizer- *Azotobacter* and *Rhizobium*