# SOLAPUR UNIVERSITY, SOLAPUR
## Semester Pattern Syllabus
## B.Sc. I
## Entrepreneurship
## (w.e.f. June 2010)
## Sem I

| Course Code | Title of the Course | Theory / Practical | Marks | Lecture / Practical Period |
|---|---|---|---|---|
| **Ent-101** | **Entrepreneurship Paper I**<br>(The word of Business.)<br>**Entrepreneurship Paper II**<br>(Economics and Financial management) | Theory | 50 | 40 |
| **Ent-102** | **Industrial Chemistry I**<br>(Industrial aspects of Industrial Chemistry)<br>**Industrial Chemistry II**<br>(Industrial aspects of physical chemistry) | Theory | 50 | 40 |
| **Ent-103** | **Industrial Microbiology I**<br>(fundamental of microbiology)<br>**Industrial Microbiology II**<br>(Microbial techniques) | Theory | 50 | 40 |
| **Ent-104** | **Industrial Biotechnology I**<br>(Cell biology)<br>**Industrial biotechnology II**<br>(Animal & plant physiology) | Theory | 50 | 40 |
| **Ent-105** | English. | | 50 | 40 |

* **Ent.code 105** English syllabus which is recommended for B.Sc. Course.

**B.Sc. Ist (Sem.I) Entrepreneurship**

## Ent -101 Entrepreneurship Paper –I The World of Business.

**A) Entrepreneurship: (20 P)**

**Introduction**

a) Concept of entrepreneurship Development **2 P**

b) Entrepreneur - Definition, attributes and characteristics of Successful entrepreneur, types and functions of entrepreneur **4 P**

c) Entrepreneur v/s Entrepreneur, Entrepreneur v/s Entrepreneurship Entrepreneur v/s Manager. **3 P**

d) Role of Entrepreneur in developing economy - Indian Economy with reference to self employment development. **3 P**

e) Creativity, Innovation and Idea generation creative process, components of creative performance - Intrinsic Motivation, skills in the task and skills in creative thinking. The business idea - Selection, source & generation. **5 P**

f) Problems in starting a new venture. **3 P**

- Economic problem - Capital, Labour, Raw material
- Non economic problem - Environmental, Social, Cultural Blocks, Emotional blocks.
- Personal Factors - Lack of sustained motivation, Difficulty with ambiguity, inability to dream, impatience, lack of clear perception.

**B) The World of Business:**

Introduction Meaning, Definition, Characteristics, Features of business, Scope of business and classification of business activities. **6 P**

- Objectives of Business and essential requirements of success in business.
- Essential of a good businessman and
- Ethical values in business **2 P**

a) Types of business organization **6 P**
Characteristics, merits and demerits of the following -
Sole Trader, HUF Firm, Partnership, Private Limited, Public Limited Companies, Joint Sector, Public Sector, Co-operative Societies, Multinational and transnational.

b) Industries - Definition, types, brief history, characteristics. **3 P**

c) Introduction to commerce and Aid to commerce **3P**

**Ent 101 paper II Economics and Financial management (40 P)**

**A) Economics for Managers (20 P)**

1. a) Economics - Social Science - Definition - wealth, Welfare & Scarcity definition and explanation. **2 P**
   b) Some basic economics concepts and their definition. **2 P**
   Goods, Human wants, value, prices, wealth, capital, utility and its types of consumption and investment.
2. a) Managerial Economics - Meaning, definition, nature and scope of management economics. **2 P**
   b) Role of Managerial Economists **2 P**
   c) Theory of the firm and objectives of the firm. **2 P**
   d) Demand and Demand Analysis **4 P**
   - Demand Schedule
   - Demand Analysis and its Objectives - determination of demand.
   - To measure elasticity of demand.
   - To Prepare Sales Forecasts.

   e) Economics of Scale - Internal and External **3 P**
   f) Returns of Scale **3 P**
   i) Production Function - Production Function (with all variable inputs as return as scale.
   Increasing return, constant return and diminishing return.

**B) Financial Management for Entrepreneurs 20 P**

1. Meaning of business finance - Definition Scope and function of business finance. **2 P**
2. Sources of financial information, dailies, journals, periodicals and magazines etc. **2 P**
3. Internal & External users of accounting information. **3 P**
4. Basic accounting terminologies, different types of accounts, their rules and identification, passing of journal entries. **4 P**
   Statements of financial Information - An over view of income statement, manufacturing account, profit & loss account & Balance Sheet.
5. Understanding of above statements and different items in them. **4 P**
6. Sources of Finance - Internal & External Sources **2 P**
7. Need for Financial Planning - **3 P**

<u>Classification of Financial needs</u>

1) On the basis of extent of permanence - Fixed Capital, Working Capital
2) On the basis of period of use - Long Term, Short Term

**B.Sc. I Entrepreneurship**

## Ent -102 Industial chemistry (Paper I) Industrial aspects of Chemistry (40P)

### Industrial Aspect of Chemistry

**1. Economic Aspects of Chemical Industry (4 P)**

1) Definition of the chemical industry, the place of chemical industry.
2) Characteristic of the chemical industry
   a) Investment trends
   b) Commercial development & competition factors
3) Technological orientation.
4) Worldwide chemical industry.

**2. Fuels (7 P)**

1) Types of fuels, testing of fuels i.e. calorific value, heating value.
2) Octane number, flash point, fire point & applications.
3) Introduction of petroleum
4) Constituents and refining of petroleum i.e. fractionation of crude oil.
5) Natural gas, (C1 to C4) strain run, gasoline (C5 to C12), kerosene.
6) Diesel & Residual oil.
7) Cracking
8) Reforming, hydro forming, isomerisation.

**3 Industrial Polymer (7 P)**

1) General idea of polymers
2) Types of polymers, homogeneous & heterogeneous polymers, classification based on a) origin b) composition c) method of vulcanization d) physical properties e) elastomers f) thermoplastic g) thermo settings.
3) Linear, branched & cross linked polymers
4) Addition polymers, polyethylene, polypropylene, pvc, orlon, teflon, polystyrene
5) Condensation polymers, terylene, nylon-66, resin, bakelite & melamine
6) Synthetic elastomers - styrene, butadiene, nitrilerubber, Buna-s, Buna-N, rubbers vulcanization

**4. Water Pollution (10 P)**

1) Types of pollutant, causes of water pollution
2) Analysis of water pollution
3) Monitoring techniques and methodology
4) T.D.S. (Total dissolved solid)
5) D.O. (Dissolved oxygen)
6) B.O.D. (Biological Oxygen Demand)
7) C.O.D. (Chemical Oxygen Demand)
8) T.O.C. (Total organic carbon)
9) Hardness, chloride, alkalinity
10) Sulfide, nitrite, iron Mg.
11) Sodium potassium, pesticides, surfactants etc.

**5. Air Pollution (5 P)**

1) Types of pollutant
2) Sources of pollution
3) Air quality standards
4) Sampling of Air
5) Toxic effect of carbon monoxide, nitrogen oxide, sox, nox
6) Acid rain
7) Analysis of CO, Nox, Sox, Hydrocarbons.

**6. Catalysis (7 P)**

1) Introduction
2) Types of homogeneous, Heterogeneous, positive, negative, auto, induced catalysis, acid base & enzyme catalysis.
3) Characteristics of catalytic reaction.
4) Basic principle, mechanism of catalysis, intermediate comp, formation theory, adsorption theory.
5) Factors affecting the performance.
6) Introduction to phase transfer catalysis, enzyme catalysis.

**Ent 102 Industial chemistry (Paper II) Industial aspects of physical chemistry 40 P**

1. Dimensions and Units (6 P)

1) Atomic weight molecular weight, equivalent weight, mode
2) Composition of liquid mix and gaseous mixture, stochiometry
3) Calculations of percentage (W/W), (W/V), (V/V)
4) Different methods of determination of concentration
5) Mole of fraction and atomic fraction.
   (Simple numerical problems are expected)

**2. Thermo Dynamics & Thermo Chemistry (15 P)**

1) Enthalpy, heat capacity
2) Spontaneous process, non spontaneous process
3) Second law of thermodynamics, Carnot theorem (Numerical problems are expected from heat engine, head of reaction cycle)
4) Heat of mixing Hess' Law, Heat of decomposition.
5) Carnot's cycle & its efficiency, Kirchhoff's equation, Joule Thompson effect. (Simple numerical problems are expected)

**3. Vapors Pressure (6 P)**

1) Vaporization boiling, point, vapor pressure of liquid.
2) Effect of temperature on vapor pressure of immiscible liquids
3) Roult's Law, Equilibrium vapor pressure
4) Composition (Numerical's based on Roult's Law)

**4. Reaction Kinetics (9 P)**

1) Rate of reaction, rate constant, order & molecularity of reaction, Kinetics of $1^{st}$ & $2^{nd}$ Order reactions
2) Equilibrium constants (Kp, Kc & Kx) for homogeneous reactions
3) Effect of temperature on rate of reaction, temperature coefficient.
4) Arrhenius equation, theories of reaction rate, collision theory, transition state theory
5) Energy of activation
6) Catalysis and elementary enzyme reactions.

**5. Dipole Moment (4 P)**

1) Introduction
2) Additive & constitutive properties
3) Dipole moment, electrical polarization of molecules
4) Use of dipole moment in the study of molecular structure.

**B.Sc. I Entrepreneurshi**

**Ent- 103 Paper-I Industrial Microbiology (Fundamental of microbiology) 50 M**

**- Fundamental of Microbiology** **40P**

**1. Milestones in Microbiology** **(06)**

Important Contribution of

1) Antony Van Leeuwenhoek
2) Louis Pasteur
3) Robert Koch
4) Alexander Fleming
5) John Tyndall

2. General Characteristics of Microorganisms (12)

1) Types of Microorganisms - Bacteria, Algae, Fungi, Protozon & Viruses
2) Difference between Prokaryotic & Eukaryotic Cell
3) Morphology & Cytology of Bacterial Cell
   a. Size, b.Shape, c. Arrangement of Bacteria
4) Structure & Functions of Bacterial-
   a. Cell wall b. Cell membrane
   c. Capsule & Slime layer d. Flagella
   e. Pili f. Nuclear material
   g. Mesosome h. Ribosome

3. Bacterial Taxonomy (04)

1) General Principles of Nomenclature
2) Bacterial Classification based on- -
   a. Morphological characters b. Cultural characters
   c. Biochemical characters d. Serological characters

4. Stain & Staining Procedures (05)

1) Definition & Types of Stains
2) Simple & differential staining (Gram's staining

**5. Microbial Nutrition** **(05)**

1) Basic nutritional requirements of microorganisms
2) Nutritional classification based on Carbon & Energy source

**6. Microbial Growth** (08)

1. Definition of Growth 2. Growth Phases
3. Growth measurements 4. Continuous growth
5. Synchronous growth 6. Diauxic growth
7. Chemostat 8. Turbidostat

**Ent 103 Industial microbiology Paper II (Microbial Techniques) 40 P**

**1. Microscopy (10)**

Principles & Application of

a. Bright field
b. Dark filed
c. Phase contrast
d. Fluorescent
e. Electron - SEM, TEM

**2. Cell Cultivation Techniques (10)**

Culture Media & their Types

a. Living
b. Non-Living
c. Natural
d. Synthetic
e. Semi-synthetic
f. Enrichment
g. Enriched
h. Selective
i. Differential

**3. Enrichment Techniques (03)**

**4. Isolation Techniques (05)**

a. Serial dilution
b. Streak plate
c. Pour plate
d. Spread plate

**5. Isolation & Cultivation of Anaerobes (03)**

**6. Techniques of Cultivation of Actinomycets (03)**

a. Slide culture
b. Cover slip
c. Agar Block

**7. Cell Enumeration Techniques (06)**

Direct Methods

a. DMC
b. Petro-Hoff's Chamber
c. Coulter counter

Indirect Methods

a. SPC
b. Membrane filter technique

**B.Sc. Ist Year Entrepreneuship**

## Ent- 104 Industial biotechnology Paper I (Cell Biology )

(50marks) (40 Lectures)

**- Cell Biology**

**1 Introduction (8 L)**

Cell as a basic unit of living system, Biochemical composition of cell, protein, lipid, carbohydrate, nucleic acid. The cell theory ultrastructure of cell.

**2 Cell Membrane:** (12 L)

Membrane composition, early studies on plasma membrane. The lipid bilayenmembrance. A summary of membrane functions - simple diffusion, facilitated transports, active transport, endocytosis, pinocytosis, phagocytosis, exocytosis. Cell senescence and death, cell differentiation.

**3. Cell Organelles (20 L)**

Structure and function of the endoplasmic reticulum, Golgi complex, lysosome, Ribosome, Mitochondria and Chloroplast, Structure and Function of Nucleus, Nuclear envelope, Structure of Chromatin, Nucleosome and chromosome, cell cycle, mitosis & meiosis.

**Ent 104 Industial biotechnology Paper II (Animal and Plant Physiology)**

**40 L**

1. **Digestive system –** **(6L)**
   Introduction, Alimentary canal, Digestive Glands & Digestion.
2. **Reproductive System -** **(6L)**
   Introduction, Male reproductive system & female reproductive system
3. **Muscles:** **(4L)**
   Striated & unstriated muscle cells, Mechanism of contraction & relation.

4. **Photosynthesis –** **(10)**
   Introduction and significance of photosynthesis apparatus, Photosynthetic pigments, accessary pigments, light reaction, photo systems, reaction center complex, photo chemical reaction, Emerson enhancement effect, Electron transfer path way in chloroplast membrane, Photophosphorylation

5. **Dark reaction, Calvin cycle $C_4$, CAM** **(5L)**

6. **Respiration –** **(9L)**
   Introduction, glycolysis, TCA Cycle, ETS in mitochondria, Oxiditive phosphorylation, Pentose phosphate pathway.

**Recommended Books**


1. De Robertis, E.D.P. & De. Robertes, E.M.F.2001 Biology, Cell and Molecular Biology Lea & Febiger.
2. Bruce Albert, A. Bray, D.Lewis, J.Raff, M.Robers, K. Watson, J.D. 2000, Molecular Biology of Cell, 4th Edition, Garland.
3. Lodish H.199, Molecular Cell Biology, W.H. Freeman & Co. 4th Edition.
4. Drnell, J.E. 2000, Molecular Cell Biology, W.H. Freeman & Co.
5. Physiology by Ghyton
6. Physiology by Berry Berry.
7. Cell biology by C.B. Pawar.
8. Gene VIII By Benjamin and Lewins.

# SOLAPUR UNIVERSITY, SOLAPUR

## Semester Pattern Syllabus semester II

## B.Sc. PART-I

## Entrepreneurship

**(w. e. f. June 2010)**

**SEMESTER - II**

| Course Code | Title of the Course | Theory / Practical | Mark | Lecture / Practical Period |
|---|---|---|---|---|
| **Ent-106** | **Entrepreneurship Paper III**<br>(Principles of marketing and management accounting)<br>**Entrepreneurship Paper IV**<br>(Cost accounting and Project managaement.) | Theory | 50 | 40 |
| | Laboratory course – I | Practical | 50 | |
| **Ent-107** | **Industrial Chemistry paperIII**<br>(Industrial aspects of chemistry I)<br>**Industrial Chemistry paper IV**<br>(Energy and chemical reactions) | Theory | 50 | 40 |
| | Laboratory course – I | Practical | 50 | |
| **Ent-108** | **Industrial Microbiology III**<br>(Fundamentals of indusrial microbiology)<br>**Industrial Microbiology IV**<br>(Basic techniques in industrial microbiology) | Theory | 50 | 80 |
| | Laboratory course – I | Practical | 50 | |
| **Ent-109** | **Industrial Biotechnology III**<br>(industrial biochemistry)<br>**Industrial Biotechnology IV**<br>(industial biochemistry ) | Theory | 50 | 40 |
| | Laboratory course – I | Practical | 50 | |
| **Ent-110** | English. | | 50 | 40 |

* Ent.code 110 English syllabus which is recommended for B.Sc. Course.

**B.Sc. I Entrepreneurship (sem II)**

**Ent. – 106. Entrepreneurship Paper III (Principles of Marketing and management accounting)**

## A) Principles of Marketing — 20 P

### 1. Introduction — 2 P

a) Nature and scope of Marketing
Concept and definition of market, Marketing and Marketing Management.

b) Core concepts of marketing. — **2 P**

c) Company orientation towards the market - — **3 P**
concept of marketing - production concept, product concept, selling concept, marketing concept, customer concept, societal concept.

d) Marketing Environment - Idea about external uncontrollable and internal controllable forces. — **2 P**

e) Problems of marketing – Competition with modern sector, lack of sales promotion weak in bargaining power. — **2 P**

f) Market segmentation — **2 P**

g) Marketing mix strategy - Marketing for new economy, introduction to 4 Ps. — **2 P**

h) Branding, Packing & Packing policy — **3 P**

i) Distributor channels or method of marketing. — **2 P**

## B) Management Accounting — 20 P

a) Meaning and concept — **2 P**

b) Nature and scope of management accounting. — **3 P**

c) Accounting concepts and conventions — **3 P**

d) Accounting principles. — **2 P**

e) Cost volume profit and analysis — **6 P**
i) Break even analysis - Assumption, Methods and uses.
ii) Contribution, P/V ratio, Margin of safety, BEP in units & Rupees

f) Problems on BEP, P/V ratio and MOS for entrepreneur’s decisions about the profit planning of the business — **4 P**

**Ent 106 Entrepreneurship Paper IV (cost accounting and Project management)**

***Cost Accounting and project Management***

**A) Cost Accounting** **20 P**

a) Basic Terms - Def. of Cost, Price Value, Types of Cost - by nature of elements, by function, by controllability, by changes in Activity or volume definition and examples each. **5 P**

b) Cost Accounting financial accounting and Management Accounting definition, Characteristics and difference. Object of Cost Accounting. **4 P**

c) Classification of Elements of cost as material, labour and expenses direct and Indirect Examples of each. **3 P**

d) Preparation of cost sheet. Job Cost Sheet - Definition, Features, Advantages and limitations, cases on job cost sheet. **5 P**

e) Classification of costing methods - Job costing, Contract costing, Batch costing, Pre costing, One Operation Costing, Service Costing Form costing (Explanation and where to use only) **3 P**

## B) Smart up and Project Management

1. Small Enterprises as introductory frame work **1 P**
   a) Definition Characteristics, Relationship between small & large unit. **3 P**
   b) Objective & Scope of Small business **2 P**
   c) Problems of SSI **2 P**
   d) Role of Small Entrepreneurship in Economic Development **3 P**
2. Project Management **3 P**
   a) Definition and meaning of project.
   b) Types of project.
   c) Project identification, selection.
3. Project formulation. **2 P**
   a) Meaning of project report.
   b) Significance of project report.
   c) Contents of project report.
4) Process of project development **4 P**
   a) General information.
   b) Project description.
   c) Market potential.
   d) Capital cost and sources of finance.
   e) Assessment of working capital requirement
   f) Other financial aspects.
   g) Economic and social variables.
   h) Project implementation.

**Entrepreneurship Practical**

(50 marks)

1. Understanding creative process.
2. Preparation of cost sheets.
3. Exercise of job cost sheets.
4. Exercise on job cost sheets.
5. To pass a journal entries.
6. To explain the given balance sheet of the proprietor.
7. Exercise on internal sources of finance.
8. Exercise on external sources of finance.
9. To study sources of fixed capital.
10. To study sources of working capital.
11. Exercise on cost volume profit analysis.
12. Exercise on demand forecasting.
13. Exercise on elasticity of demand.
14. To study problems of small scale industry.
15. To prepare project report on market analysis.
16. To prepare project report on technical analysis.
17. To prepare project report on financial analysis.
18. Exercise on market survey.

**Industrial visits :**

2 (two) visits in first term,
2 (two) visits in second term

**Visit to Institutions** :

1 (one) visit in semester-I
1 (one) visit in Semester-II

During visit following observations must be done.

1. To see plant or factory. Interaction with concerned officers, supervisor and workers.
2. Questioners should be supplied to students about manufacturing process, accounting section, administration section or any other department.

## Bibliography


**Entrepreneurship**

1. Entrepreneurial Development - S.S. Khanka
2. Entrepreneurial Development - Satish Taneja & Dr.S.L. Gupta
3. Entrepreneurial Development - P.C. Shejwalkar
4. Dynamics of Entrepreneurial Development - Vasant Desai.

**The world of business**

1. General Commercial Knowledge - P.K. Ghosh & Y.K. Bhushan
2. Modern Business Organization & Management - S.A. Sherlekar

**Cost Accounting**

1. Cost Accounting - Jain & Narang
2. Cost Accounting - Bhar
3. Cost Accounting – Jawahar

**Financial Management**

1. Marketing Management Analysis, Planning, Implementation and Control - Philip Kotlar
2. Marketing Management - Philip Kotlar
3. Fundamental Marketing - W.J.Stanton
4. Fundamental Marketing - M.J. Etzes.
5. Fundamental Marketing - B.J. Walker
6. Fundamental Marketing - S.A. Sherlekar

**Management Accounting**

1. Management Accounting - J. Made Gowda
2. Principles of Management Accounting - S.N. Maheshwari
3. Management Accounting - Guru Prasad Murthy
4. Practical Problems in Management Accounting - RS Kulshreshta,SC Gupta
5. Management Accounting Practical Problem - Dorai Raj S.N.

**Managerial Economics**

1. Managerial Economics in a Global Economy - Dominick Salvotole.
2. Introduction to Economics - Samulson & Nordhams
3. Managerial Economics – Mahajan

**Small Scale Industries**

1. Small Scale Industries - Vasant Desai
2. Project Management - Nagarajan
3. Project Management : A Development Perspective - B.B. Goel
4. Dynamics of Entrepreneurship Development - Vasant Desai

Entrepreneurship - Madhurima Lall
Entrepreneurship - Shikha Sahai
Entrepreneurship Development - S.S. Khanka
Srivastaba S.B.A. Practical Guide to Industrial Entrepreneurship Sultan Chand and Sons, New Delhi.
Prasanna Chandra : Project Preparation, Appraisal, Implementation, Tata McGraw Hill, New Delhi.
Holt : Entrepreneurship - New Venture Creation : Prentice hall of India.

## B. Sc. I. Entrepreneurship
## Ent. -107 Paper – III Industrial Chemistry
## (Industrial Aspect of Chemistry)

**50 marks (40 P)**

**1. Heat Transfer (7 P)**

1) Fundamental of heat transfer conduction, convection and radiation.
2) Furriers law, Stefan's Bolt man's law and thermal conductivity.

**2. Ceramics (7 P)**

1) Introduction, types
2) Permeable and impermeable wares
3) Classification based on reduction in porosity
4) Basic raw material, other ingredients
5) Manufacturing process Applications.
6) Grinding of raw materials, mixing, firing, kneading, throwing, jollying
7) Slip casting, pressing, drying, firing, continuous and periodic kilns, glazing, and decoration.

**3. Refractories (7 P)**

1) Introduction, Types
2) Properties of refractories, Manufacture of refractories
3) Applications
4) Enamels, raw materials, uses of enamels.

**4. Cement (7 P)**

1) Introduction, Types of cement, composition
2) Raw materials, Properties of cement
3) Manufacturing of cement
4) Analysis of cement (calcium & iron only)

**5. Synthetic Dyes (4 P)**

1) Introduction, Chromophore, auxochrome
2) Qualities of good dye
3) Classification based on constitution & methods of applications.
4) Witt's theory, colour & constitution.

**6. Alcohol Industry (4 P)**

2) Fermentation, conditions favorable for fermentation
3) Characteristics of enzymes
4) Fermentation unit operation
5) Manufacturing of ethyl alcohol from molasses
6) Rectified spirit, denatured spirit, absolute alcohol & power alcohol
7) By-products of alcohol industry.

**7. Pharmaceuticals** **(4 P)**

1) Introduction
2) Qualities of ideal drugs
3) Methods of classification of drugs
4) Classification based on therapeutical action

**Ent 107 Industrial Chemistry Paper IV (Energy & chemical reactions)**

**1. Material Balance without Chemical reactions (13 P)**

1) Flow diagram for material balance
2) Simple material balance with or without recycle of bypass
3) Chemical engineering operation such as -
   - distillation,
   - absorption,
   - crystalization,
   - evaporation,
   - extraction etc.

   (Numerical problems are expected)

**2. Material Balance involving Chemical reactions (13 P)**

1) Concept of limiting reactants
2) Conversion
3) Yield
4) Liquid phase reaction
5) Gas phase reaction with our without recycle of bypass.
   (Numerical problems are expected)

**3. Energy Balance (14 P)**

1) Principles of energy balance
2) Heat capacity of pure gases and gases mixture at constant pressure
3) Sensible heat changes in liquids
4) Enthalpy changes
   (Minimum weight - age of 40 % be given to the numerical problem in the examination)

**B.Sc. I Entrepreneurship**

**Paper – Lab Course I**

**For Industrial Chemistry Practicals**

**50 marks**

## Lab Course - I

1. Calibration of burette, pipette and beryl pipette
2. Preparation of 100 ml of 0.1 N $KMnO_4$ and its standardization.
3. Preparation of 0.1 N HCl by density calculation & its standardization.
4. Study of flash point & fire point of given solvent fuel.
5. Determining molecular weight polyvinyl alcohol by Viscometer.
6. Study of melt flow index.
7. Study of soaping point.
8. Preparation of M-dinitrobenzene
9. Preparation of nitro derivative of salicylic acid.
10. Separation of amino acids by thin layer chromatography
11. Determination of hardness of water.
12. Determination of D.O.
13. Determination of acidity, alkalinity of water
14. Determination of saponification value of oil
15. Determination of acid value in bleaching powder
16. Determination of available chlorine in bleaching powder
17. Determination of chloride in water by Mohr's method.
18. Determination of heat solution of $CuSO_4$
19. Estimation of iron from the cement (Volumetrically)
20. Separation of metal ions ($Cu^{+2}$, $Co^{+2}$, $Ni^{+2}$) by paper chromatography.
21. Kinetics of $1^{st}$ and $2^{nd}$ Order reaction.
23. Density of given liquid by pyknometer.

**Bibliography:**


1. Metallurgical Analysis - S.P. Jain, B.C. Agrawal.
2. Industrial Chemistry - B.K. Sharma
3. Experiments and Calculation in Eng. - S.S. Dara
4. Polymer Chemistry - Govarikar
5. Polymer Chemistry - Bill Meyer
6. Environmental Chemistry - A.K. De
7. Environmental Chemistry - Harry W. Vanloon, Stephin J.Duffy, Oxford University Press.
8. Environmental Chemistry - S.S. Dara
9. Pollution Control, Catalysis, Science & Technology - Anderson J.
10. Catalysis in Macromolecular System - Micelles E.
11. Catalysis in Theory & Practice - Rider E.A. Talose S.A.
12. Catalysis Heterogeneous & Homogeneous - Delmon, Elsvier Sci. Publisher
13. Text Book of Physical Chemistry - Puri & Sharma
14. Thermodynamics for Chemist - S.Glasstone
15 Thermodynamics - Rastogi & Mishra
16 Stichomistry - Bhatt and S.N. Vora. Tata MCgraw Hill
17 Chemical Process Principal Part J - O.A. Hougen, K.M. Watson, R.A. Ragataz, Asian Publishing House, Mumbai.
18. Metallurigical Thermo Chemistry - O.Kubshewski, C.B. Alcock - Fifth edition, Parghmon press

**B.Sc. I (Sem.II) Entrepreneurship**
**Ent.108 Paper – III -Industrial Microbiology**
**(Fundamentals of industrial microbiology)**

**Fundamentals of Industrial Microbiology** **40 p**

1. Definition & scope of industrial microbiology (03)

2. Preservation & Maintenance of Industrially Important Microorganisms (05)

3. Fermenter - Design, Parts & their functions (07)

4. Fermentation Media (10)
   a. Raw material
   b. C & N sources
   c. Alternative sources
   d. Buffers
   e. Antifoam agents
   f. Precursors

5. Methods of Sterilization (15)
   a. Use of Heat
   b. Use of Radiation
   c. Use of Chemicals
   d. Use of Filtration
   e. Gaseous agentsEnt 108 Industial microbiology ( Basic Techniques in Industrial Microbiology)

## Ent 108 Industrial Microbiology Paper-IV (Basic techniques in Industrial Microbiology)

**1. Screening Techniques** **(08)**

a. Primary screening
b. Secondary screening

**2. Assays** (08)

a. Microbial assay
b. Chemical assay
c. Enzymatic assay

**3. Strain Improvement** (10)

a. Mutagenesis (Chemical and UV)
b. Site directed mutagensis
c. Gene Manipulation

**4. Development of Inoculums and Scale up of fermentation** (04)

**5. Product Recovery Methods** **(10)**

a. Precipitation
b. Crystallization
c. Solvent Extraction
d. Distillation
e. Filtration
f. Centrifugation.

**Recommended Books**


1. Brock, Biology of microorgasnisms
2. Text book of microbiology by C.H. Pelzar.
3. Text book of Microbiology By T.Bapat Phadake Publication.
4. Text book of Industrial Microbiology By L.E. Casida.
5. Principles of Fermentaion Technology by Whithakar.
6. Bergey's Manual of systematic bacteriology Vol-IV.

**B.Sc. I (Sem.II) Entrepreneurship**

**Lab Course based on Industrial Microbiology**

1) Microscopy
2) Demonstration of Lab. Equipments

   Incubator, Autocalve, Hot Air Oven, Centrifuge, Laminar Air flow, Colony counter.
3) Staining of Bacteria

   Monochrome Staining

   Gram Staining

   Hanging Drop Technique
4) Mounting & Identification of Fungi
5) Preparation of Culture Media

   Peptone Water, Nutrient Broth, Nutrient Agar, Mac Conkey's Broth, Mac Conkey's Agar, Sabouraud's Agar
6) Isolation of microorganisms by

   Steak plate technique

   Pour plate technique

   Spread plate technique
7) Enumeration of microorganisms from Soil by SPC
8) Screening of Antibiotic & Enzyme producing microorganisms by suitable Technique.
9) Microbial Assay of Penicillin
10) Growth Curve

**B.Sc. I (Sem.II) Entrepreneurship**

**Ent. - 109 Industrial biotechnology Paper III (Industrial Biochemistry)**

(50 marks)

**1. Introduction (8 L)**

Nature of biological material, Identifying characteristics of living matter, molecular logic of life, bioelements, general properties of biomolecules, central role of carbon, water structure and unique properties, acid, base, buffers, polyprotic acids.

**2. Carbohydrates (10 L)**

Monosaccharides: classification, configuration, conformation and derivaties, common disacchariedes, structure and occurrence of storage and structural polysaccharides, glycosaminoglycans, Glycoprotein : structure & function.

**3. Lipids (10 L)**

Fatty acids, Triacylglycerol, Glycerophosphilipds, Sphingolipids : Spangomylines, Cerebrosides & ganagliosides, Cholesterol, Micelles, Bilayers, Liposomes, Lipoprotein structure & function.

**4. Amino Acids and Protein (12 L)**

Amino acids : structure, nomenclature and general properties, peptide bond, primary structure of proteins : end group analysis, amino acid composition, specific peptide cleavage and sequence determination, Secondary structure : peptide group, Ramachandram diagram, Helical structure : alpha-helix & other polypeptide helices, Beta-pleated sheets, Protein stability : Electrostatic interactions, hydrogen bond & hydrophobic forces, disulphide bond, general idea of tertiary and quaternary structure of proteins.

**Ent 109 Industrial biotechnology Paper IV (Industrial biochemistry)**

**1. Vitamins and Enzymes (22 L)**

Vitamins of B-group: their coenzyme forms, recommended dietary allowance (RDA), source and biochemical function. Fat soluble vitamins : RDA sources and function. Enzymes : historical perspective, naming and classification, enzyme units, specificity & stereospecificity, Enzyme kinetics : Michaelis-Menton equation and its transformations, significance of kinetic parameters, Ks, Km and Kcat, Catalytic mechanisms of enzyme: acide base, covalent, metal ion and electrostatic catalysis, preferential binding of transition state, proximity & orientation effects, Detail mechanism of action of chymotrypsin. Various uses of enzymes: enzymes in food processing, medicine, diagnostics and production of new compounds, Enzymes as research tools.

2. Metabolism (18 L)

Anabolism, catabolism, Glycolysis (EMP), TCA, HMP, Glyoxilate cycle and energetics

**Recommended Books**


1. Voet & Voet, 2000 Biochemistry, John Wiley, New York
2. Zubay, 1995, Biochemistry, Brown Publishers.
3. Lehminger, 2000, Principles of Biochemistry, CBBS Publishers.
4. I.Stryer, 2002. Biochemistry, W.H.Freeman.

**B.Sc. I Entrepreneurship**
**Industrial Biotechnology**
**Lab Course based on Industrial Biotechnology**

1. Spot test for carbohydrates
2. Estimation of reducing sugars by Benedict's method
3. Spot test for Amino acids
4. Protein estimation by Biuret method
5. Quantitative determination of amino acid with Ninhydrin reagent.
6. Saponification of Fats
7. Estimation of Cholesterol
8. Study of acid Phosphatase from liver
9. Study of Alkaline Phosphatase from Liver
10. To study estimation of Titrable Acid Number (TAN)
11. Enzyme assays
12. To study Prokaryotic organisms
13. To study Eukaryotic organism
14. Study of Sub cellular organelles
15. Staining of mitochondria
16. Demonstration of digestive system of rat
17. Demonstration of reproductive system of rat
18. Muscle cell staining
19. To study rate of photosynthesis or Oxygen evolved in Photosynthesis
20. To study comparative rate of stomatal and cuticular transpiration.
21. To extract and separate chloroplast pigment by ascending paper chromatography.

# Solapur University, Solapur

## Nature of Question Paper For Semester Pattern

- **Faculty of Science**

**(w.e.f. June 2010)**

**Time :- 2 hrs.** **Total Marks-50**

**Q. No.1)** **Multiple choice questions.** **(10)**

**1)** ----------

**a) b) c) d)**

**2)**
**3)**
**4)**
**5)**
**6)**
**7)**
**8)**
**9)**
**10)**

**Q.No.2)** **Answer any Five of the following** **(10)**

**i)**
**ii)**
**iii)**
**iv)**
**v)**
**vi)**

**Q.No.3)** **A) Answer any Two of the following** **(06)**

**i)**
**ii)**
**iii)**

**B) Write the Answer/Solve/Problem/Note** **(04)**

**Q.No.4)** **Answer any Two of the following** **(10)**

**i)**
**ii)**
**iii)**

**Q.No.5)** **Answer any Two of the following** **(10)**

**i)**
**ii)**
**iii)**

1. **Structure of the courses :-**

A) Each paper of every subject for Arts, Social Sciences & Commerce Faculty shall be of 50 marks as3 resolved by the respective faculties and Academic Council.
B) For Science Faculty subjects each paper shall be of 50 marks and practical for every subject shall be of 50 Marks as resolved in the faculty and Academic Council.
C) For B. Pharmacy also the paper shall be of 50 marks for University examination. Internal marks will be given in the form of grades.
D) For courses which were in semester pattern will have their original distribution already of marks for each paper.
E) For the faculties of Education, Law, Engineering the course structure shall be as per the resolutions of the respective faculties and Academic Council.

2. **Nature of question paper:**

**A) Nature of questions.**

"20% Marks - objectives question" **(One mark each and multiple choice questions)**
"40% Marks - Short notes / Short answer type questions / Short Mathematical type questions/ Problems. **(2 to 5 Marks each)**
"40% Marks - Descriptive type questions / Long Mathematical type questions / Problems. **(6 to 10 Marks each)**

B) Objective type question will be of multiple choice (MCQ) with four alternatives. This answer book will be collected in first 15 minutes for 10 marks and in first 30 minutes for 20 marks. Each objective question will carry one mark **each.**
C) Questions on any topic may be set in any type of question. All questions should be set in such a way that there should be permutation and combination of questions on all topics from the syllabus. As far as possible it should cover entire syllabus.
D) There will be only five questions in the question paper. All questions will be compulsory. There will be internal option **(30%)** and not overall option. **for questions 2 to 5.**

3. Practical Examination for B. Sc. I. will be conducted at the end of second semester.
4. Examination fees for semester Examination will be decided in the Board of Examinations.

The structures of all courses in all Faculties were approved and placed before the Academic Council. After considered deliberations and discussion it was decided not to convene a meeting of the Academic Council for the same matter as there is no deviation from any decision taken by Faculties and Academic Council. Nature of Question Paper approved by Hon. Vice Chancellor on behalf of the Academic Council.