

**STATE COUNCIL OF TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA**  
**TEACHING AND EVALUATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES**

<b>DISCIPLINE: BIO-TECHNOLOGY</b>						<b>SEMESTER: 4<sup>TH</sup></b>						
<b>SL N O</b>	<b>SUBJEC T CODE</b>	<b>SUBJECT</b>	<b>PERIODS</b>			<b>EVALUATION SCHEME</b>						
			<b>L</b>	<b>T</b>	<b>P</b>	<b>INTERNAL EXAM</b>			<b>END SEM EXAM</b>	<b>TERM WORK</b>	<b>PRACTI CAL EXAM</b>	<b>TOTAL MARKS</b>
						<b>TA</b>	<b>CT</b>	<b>Tot al</b>				
<b>THEORY</b>												
1.	BTT 401	BIOCHEMISTRY	3	1	-	10	20	30	70			100
2.	BTT 402	MOLECULAR BIOLOGY	3	1		10	20	30	70			100
3.	BTT 403	APPLIED MICROBIOLOGY	4	0	-	10	20	30	70			100
4.	BTT 404	FLUID MECHANICS AND HEAT TRANSFER	4	0	-	10	20	30	70			100
5.	BTT 405	IMMUNOLOGY	3	1	-	10	20	30	70			100
<b>PRACTICAL/TERM WORK</b>												
6.	BTP 401	BIOCHEMISTRY LABORATORY	0	0	4					25	25	50
7.	BTP 402	APPLIED MICROBIOLOGY LAB	0	0	3					25	25	50
8.	BTP 403	FLUID MECHANICS & HEAT TRANSFER LABORATORY	0	0	3					25	25	50
9.	BTP 404	IMMUNOLOGY LABORATORY	0	0	3					25	-	25
10.	BTP 405	FIELD STUDY/ TRAINING	0	0	3					25	25	50
11.	BTP 406	SOFT SKILL-2	0	0	3					25	-	25
<b>GRAND TOTAL</b>			<b>17</b>	<b>3</b>	<b>19</b>	<b>50</b>	<b>100</b>	<b>150</b>	<b>350</b>	<b>150</b>	<b>100</b>	<b>750</b>

Total Contact hours per week: 39

Abbreviations: L-Lecture, T-Tutorial, P-Practical, TA- Teacher's Assessment, CT- Class test

Minimum Pass Mark in each Theory Subject is 35% and in Practical subject is 50%

## BIO CHEMISTRY

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTT 401	Semester	4th
Total Period:	60	Examination	3 hrs
Theory periods:	3 P/W	Class Test:	20
Tutorial:	1 P/W	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

### Rationale :

Biochemistry deals with the chemical nature and chemical behavior of the living organisms. The growth of biochemistry during past few years has been enormous and it has developed into a major discipline of science. Although most of the fundamental principles of biochemistry are known, several important aspects such as molecular basis of conscience, action of carcinogens, biochemical engineering for breeding better human beings and crop plants and so on are yet to be understood fully.

### Objective :

After completion of the study of Biochemistry, the student will be able to:

1. Know chemical nature and behaviour of the cell and the organism related to it.
2. Know the different bio molecules that are the components of a cell and their effect on the existence and functioning of cell.
3. Know about the structure and functions of carbohydrates, lipids, nucleic acids and proteins in cell organisation and their role in regulation of different cellular processes.
4. Know about the intracellular and intercellular transport of signals, nutrition etc. due to different cellular processes.

### Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Carbohydrates	11	15
2.	Amino Acids, Peptides and Proteins	12	15
3.	Nucleotides and Nucleic Acids	11	15
4.	Lipids and Fats	10	15
5.	The Lipid Bilayer	07	10
	<b>Total</b>	<b>60</b>	<b>70</b>

## COURSE CONTENT

### 1.0 CARBOHYDRATES

- 1.1 Structure and function of monosaccharides, disaccharides and polysaccharides.
- 1.2 Proteoglycans
- 1.3 Glycoproteins with glycolipids
- 1.4 Some commercially important carbohydrates.

### 2.0 AMINO ACIDS, PEPTIDES AND PROTEINS

- 2.1 Structure and function of amino acids.
- 2.2 Classification of amino acids, according to their functional group

- 2.3 Biological activity of small peptides
- 2.4 Biosynthesis of amino acids
- 2.6 Structure and function of protein
- 2.7 Different types of protein with respect to their structure and function

### **3.0 NUCLEOTIDES AND NUCLEIC ACID**

- 3.1 Structure and function of nucleotides
- 3.2 Properties of nucleotide bases that affect the structure of nucleic acid
- 3.3 Chemistry of nucleic acid
- 3.4 Structure of nucleic acid

### **4.0 LIPIDS AND FATS**

- 4.1 Storage lipids.
- 4.2 Structural lipids.
- 4.3 Lipids with specific biological activities.

### **5.0 LIPID BILAYER**

- 5.1 Amphipathic nature of membrane lipids that form the bilayer.
- 5.2 Role of lipid in plasma membrane.

### **LEARNING RESOURCES:**

#### **REFERENCE/TEXT BOOKS:**

1. Bio-Chemistry (3<sup>rd</sup> Ed.) C.K. Mathews, K.E. Van Holde & K.G. Ahoem (Parson Education Publ.)
2. Lehninger's principles of Biochemistry – By Lehinger, Nelson & Cox
3. Biochemistry of Biochemistry – L. Stryer
4. Fundamentals Dt Biochemistry – Voet & Voet
5. Fundamental of biochemistry – Jain & Jain

## MOLECULAR BIOLOGY

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTT 402	Semester	4th
Total Period:	60	Examination	3 hrs
Theory periods:	3 P/W	Class Test:	20
Tutorial:	1 P/W	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

### Rationale:

Molecular biology is one of the most exciting disciplines of natural sciences and the thrill of its discoveries should reach the common man. Advance in molecular biology held a lot of promise for improvement of the human life, hence we believe that the excitements of this field should be transmitted to the students. This is a chemical background to appreciate that biological sciences are making a hard progress that characteristics physics and chemistry, to provide and conceptual frame work of quantitative biology that is more exciting, provocative and rationale, and to emphasize relevance of biology for human welfare.

### Objective :

After completion of the study of molecular biology the student will be able:

- I. To know about the detailed structure of DNA and its replication through template formation.
- II. To know the maintenance and modification of genome from generation to generation.
- III. To know the mechanism of gene expression and regulation of gene expression.
- IV. To know about the different machineries related to transcription and translation.

### Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Structure of nucleic acids and organization of cellular genomes	15	10
2.	Replication, maintenance and rearrangement of genomic DNA	15	20
3.	Transcription and processing of RNA	15	20
4.	Translation, processing of proteins and regulation	15	20
	<b>Total</b>	<b>60</b>	<b>70</b>

### COURSE CONTENT:

- 1. STRUCTURE OF NUCLEIC ACIDS AND ORGANIZATION OF CELLULAR GENOMES**
  - 1.1 Structure, different forms and types of DNA and RNA.
  - 1.2 Chromosomes and Chromatin
  - 1.3 Structure of Nucleosome with appropriate diagram
  
- 2. REPLICATION, MAINTENANCE AND REARRANGEMENT OF GENOMICS DNA**
  - 2.1 DNA Replication.
  - 2.2 Homologous recombination
  - 2.3 Site Specific Recombination.

- 2.4 Transposition via DNA and RNA intermediates
- 2.5 DNA Repair

### **3. TRANSCRIPTION AND PROCESSING OF RNA**

- 3.1 Different Components of transcription machinery in prokaryotes and eukaryotes,
- 3.2 Different Transcription factors
- 3.3 Transcription process (Initiation, Elongation, and Termination)
- 3.4 Different steps involved in m-RNA processing
- 3.5 Pre and Post transcriptional processing?
- 3.6 Capping and poly (A) tailing
- 3.7 m-RNA stability-RNA editing

### **4. TRANSLATION AND GENE REGULATION**

- 4.1 Genetic code (the principle of translation)
- 4.2 Main Translation machinery (t-RNA, Aminoacyl synthetase, Ribosome),
- 4.3 Translation process (Initiation, Elongation, and Termination)  
Process
- 4.4 Post translational process.
- 4.5 Regulation of Gene Expression: Constitutive and Induced gene expression
- 4.6 Regulation of gene expression in prokaryotes and eukaryotes  
Operon model (Lac-operon and Trp- operon)

### **LEARNING RESOURCES:**

#### **Text Book:**

1. The cell a molecular approach : Geottrey M. Copper
2. Molecular Biology of cell : Alberts
3. Molecular Biology of the cell: Watson

## APPLIED MICROBIOLOGY

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTT 403	Semester	4th
Total Period:	60	Examination	3 hrs
Theory periods:	4 P/W	Class Test:	20
Tutorial:		Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

### Rationale :

Microbiology is one of the largest and most complex of the biological sciences as it deals with many diverse biological disciplines. In addition to studying the nature history of microbes ,it deals with every aspects of microbe-human and environment interaction. These interactions include ecology, genetics, metabolism, infection, disease, immunology and genetic engineering, industry and agriculture.

### Objectives :

- 1 Know about the different microbes, their structure and cellular chemistry.
- 2 Know about microbial growth and its effect.
- 3 Know about genetics related to microbial era.
- 4 Know about the diseases caused by micro-organisms.

### Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Introduction	10	10
2.	Microbial nutrition and growth	08	10
3.	Tools and techniques	08	10
4.	Microbial genetics	08	10
5.	Microbial association and biological nitrogen fixation	08	10
6.	Microbial metabolism	10	10
7.	Food microbiology and microbial genetics	08	10
	Total	60	70

### CONTENTS:

#### 1.0 INTRODUCTION

- 1.1 Discovery of microscope & microorganisms.
- 1.2 Microbes & origin of life.
- 1.3 Scope of microbiology.
- 1.4 Classification of microorganisms.

- 1.5 Distribution of microorganisms in nature.
- 1.6 Structure & morphology of bacteria.
- 1.7 Virus, Fungi, Actinomycetes.

## **2.0 MICROBIAL NUTRITION & GROWTH**

- 2.1 Nutritional requirements & nutritional forms.
- 2.2 Growth cycle of bacteria.
- 2.3 Batch culture, Continuous culture, Synchronous culture.
- 2.4 Generation time & Measurement of growth.
- 2.5 Inherence of environmental factors on growth.

## **3.0 TOOLS & TECHNIQUES**

- 3.1 Microscopy
- 3.2 Staining
- 3.3 Culture Media
- 3.4 Sterilization
- 3.5 Isolation of pure culture & maintenance of pure cultures.

## **4.0 MICROBIAL GENETICS**

- 4.1 Mutation
- 4.2 Isolation of microbial mutants.
- 4.3 Genetic recombination in bacteria: - Conjugation, Transformation and Transduction.

## **5.0 MICROBIAL ASSOCIATIONS & BIOLOGICAL N<sub>2</sub> FIXATION**

- 5.1 Microbial association types.
- 5.2 Modes of N<sub>2</sub> fixation.
- 5.3 Enzymes in N<sub>2</sub> fixation.
- 5.4 Mechanism of N<sub>2</sub> fixation.

## **6.0 MICROBIAL METABOLISM**

- 6.1 Microbial respiration :Common pathways to both aerobic and aerobic respiration.
- 6.2 Aerobic pathways.
- 6.3 Fermentation
- 6.4 Microbial photosynthesis.

## **7.0 FOOD MICROBIOLOGY & MICROBIAL DISEASES**

- 7.1 Microbial food contamination.
- 7.2 Microbial food spoilages
- 7.3 Food borne diseases by microorganisms.

7.4 Food preservation.

7.5 Important viral diseases.

7.6 Important t bacterial diseases.

**LEARNING RESOURCES:**

**TEXT BOOKS:**

1, A text book of microbiology by R.P Singh

2. Microbiology by Prescott

3. Microbiology by Pelczar

## FLUID MECHANICS AND HEAT TRANSFER

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTT 404	Semester	4th
Total Period:	60	Examination	3 hrs
Theory periods:	4 P/W	Class Test:	20
Tutorial:		Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

### Rationale:

Besides the use of solids, an important engineering material, we use and handle is fluids (e.g. both liquids and gases) in wide spectrum of engineering practice. Fluid static, fluid flow phenomena flow measurement, fluid flow through pipelines, fluidized bed etc. in an industry is essentially important. There are many unit processes particularly in chemical, petrochemical; pharmaceutical, hydro-metallurgical etc. plants in which fluid flow phenomena are of fundamental importance in design consideration. It is therefore, necessary for an engineer-planning career in chemical, petrochemical, biochemical etc. industries to study fluid flow phenomena, selection of the characteristics of different fluid transportation and flow control devices.

### Objective :

On completion of studies of Fluid Mechanics and Heat Transfer the student will be able to

1. understand and explain between fluid static and fluid dynamics
2. solve problems on flow measurement, Bernoulli's equation etc.
3. acquaint themselves with various kinds of pumps, blowers & fans
4. Understand various fluid properties like density, viscosity and critical velocity, Reynolds number etc.
5. derive dimensional formula of variables in Heat Transfer.
6. understand and explain various modes of Heat Transfer.
7. acquaint themselves with various problems on Heat Transfer.
8. understand the operation of Heat Exchanger of shell and tube, multi pass and single Pass type.
9. understand the principles of evaporation and operation of evaporators.

### Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Introduction to Fluid static	05	08
2.	Fluid flow phenomena and Fluidization	14	15
3.	Flow measurement and transportation of Fluid	13	15
4.	Conductions	10	10
5.	Convections	10	10
6.	Heat Exchangers	08	12
	<b>Total</b>	<b>60</b>	<b>70</b>

## **COURSE CONTENT:**

### **1.0 INTRODUCTION TO FLUID STATIC**

- 1.1 Classification of fluid.
- 1.2 Properties of fluid.
- 1.3 Newton's Law of viscosity.
- 1.4 Differentiate Newtonian and non-Newtonian fluid.

### **2.0 FLUID FLOW PHENOMENA AND FLUIDISATION**

- 2.1 Derive the equation of continuity.
- 2.2 Types of flow.
- 2.3 Reynolds's experiment.
- 2.4 Mechanism of fluid flow in pipe.
- 2.5 Derive Bernoulli's theorem.
- 2.6 Solve simple problems related to Bernoulli's theorem.
- 2.7 Classification of fluidisation.
- 2.8 The fluid flow characteristic in packed bed.
- 2.9 Derive a pressure drop equation in fluidised bed.

### **3.0 FLOW MEASUREMENT AND TRANSPORTATION OF FLUID**

- 3.1 Fluid flow through orifice meter.
- 3.2 Derive the flow equation on orifice meter and solve simple problems on it..
- 3.3 Pressure recovery and calibration of an orifice meter.
- 3.4 Fluid flow through venture meter & derive the flow equation of it and solve simple problems on it.
- 3.5 Construction and working of rota meter.
- 3.6 Differentiate pipe and tube.
- 3.7 Identify and explain standard pipe fittings.
- 3.8 Construction and operation of different types of valves.
- 3.9 Classify pumps.
- 3.10 Construction and operation of centrifugal pump.

### **4.0 CONDUCTION**

- 4.1 Heat flow concept in conduction.
- 4.2 Steady state and unsteady state conduction.
- 4.2 Fourier's law of conduction.
- 4.3 Derive an equation of heat flow in a composite wall and a cylinder.
- 4.4 Optimum thickness of insulation.
- 4.5 Solve problems on conduction.

### **5.0 CONVECTION**

- 5.1 classify convection
- 5.2 Flow phenomenon in convection.
- 5.3 Derive equation of individual and overall heat transfer co-efficient.
- 5.4 Parallel, Co-current and counter current flow.
- 5.5 Derive log mean temperature difference.

## **6.0 HEAT EXCHANGERS AND EVAPORATORS**

- 6.1 classify heat exchanger.
- 6.2 Construction and working of single pass, and multipass, shell And tube heat exchangers.
- 6.3 Derive energy balance for shell and tube heat exchanger and solve problems.
- 6.4 Classify evaporator
- 6.5 Construction and operation of different types of evaporators
- 6.6 Solve simple material balance and energy balance problems.

### **LEARNING RESOURCES:**

#### **REFERENCE BOOKS**

1. 'Unit operations for Chemical Engineers' – Macabe & J.M.Smith (McGraw-Hill)
2. 'Introduction to Chemical Engineering.- ' Badgero & Banchero (McGraw-Hill)
3. Chemical Engineering Vol. I – Richardson & Coulson

## IMMUNOLOGY

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTT 405	Semester	4th
Total Period:	60	Examination	3 hrs
Theory periods:	3 P/W	Class Test:	20
Tutorial:	1 P/W	Teacher's Assessment:	10
Maximum marks:	100	End Semester Examination:	70

### Rationale:

Immunology deals with defence mechanism of animals against parasites, so that these animals are normally capable of resisting the infection by most pathogens. However, the biochemical and molecular basis of such resistance has been understood only during the last few decades.

### Objective :

On completion of studies of Immunology & Enzyme Engineering the student will be able to

1. Know about immune system and their role for the existence of life.
2. Know about the different types of immunological systems that occur inside the body and helps to protect the organism from different diseases.
3. Know about the biology, structure and function of enzymes in different biochemical processes about the different application of enzymes in different fields of biology.

### Topic wise distribution of periods

Sl. No.	Topics	Periods	Marks
1	Innate and acquired immunity	15	20
2.	Antibody (Structure and Function)	15	20
3.	Cell Interaction in Antibody production	15	15
4.	Vaccines	15	15
	<b>Total</b>	<b>60</b>	<b>70</b>

### CONTENTS:

#### 1.0 INNATE AND ACQUIRED IMMUNITY

- 1.1 Historic concept of immunity.
- 1.2 Differentiate between self and non self immunity.
- 1.3 Humoral and cell mediated immune mechanism.
- 1.4 List major characteristics of acquired immunity.
- 1.5 Analogy and function of lymphoid tissues.

#### 2.0 ANTIBODY (STRUCTURE & FUNCTION)

- 2.1 Discovery of antibodies

- 2.2 Structure and function of antibodies
- 2.3 Antigen-antibody interaction
- 2.4 List out biological functions of antibodies
- 2.5 Antibodies as cell membrane antigen receptor.
- 2.6 Antibodies as biotechnological tools

### **3.0 CELL INTERACTION IN ANTIBODY PRODUCTION**

- 3.1 Different experiments related to cell interactions in humoral responses.
- 3.2 Major histocompatibility structure (MHC)
- 3.3 Deduce the relation between MHC and mouse strains.
- 3.4 T and B cell interactions.
- 3.5 Antigen processing and presentation.

### **4.0 VACCINES**

- 4.1 Active & passive immunization.
- 4.2 Designing vaccines for active immunization.
- 4.3 Live and attenuated Vaccines
- 4.4 Inactivated or killed Vaccines.
- 4.5 Subunit vaccines.
- 4.6 Conjugate vaccines.
- 4.7 DNA vaccines.
- 4.8 Recombinant and DNA vaccines

### **LEARNING RESOURCES:**

#### **Reference Books:**

- 1. Immunology – Lydyard
- 2. Essential Immunology - Roift
  
- 3. Immunology- Kuby

## BIOCHEMISTRY LABORATORY

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTP 401	Semester	4 <sup>th</sup>
Total Period:	60	Examination	4 hrs
Lab. periods:	4 P/W	Term Work	25
Maximum marks:	50	End Semester Examination:	25

### List of experiments

Sl. No	Name of Experiment	No of Periods
1	Determination of pH color comparison pH meter determination of PKa value	06
2	Qualitative tests on carbohydrates and proteins.	06
3	Estimation of total sugar by anthrone method	06
4	Estimation of reducing sugar by Benedict's test.	06
5	To perform the fatty acid titration.	06
6	Verification of Beer Lambert's law .	06
7	To determine iodine value of different fat samples.	12
8	To quantify amino acid using ninhydrin reaction.	12

## APPLIED MICROBIOLOGY LABORATORY

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTP 402	Semester	4 <sup>th</sup>
Total Period:	45	Examination	4 hrs
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	50	End Semester Examination:	25

### List of experiments

Sl. No	Name Of Experiment	No of Periods
1	Sterilization techniques	05
2	Media preparation	05
3	Isolation, enumeration and purification of microbes	10
4	Gram staining	05
5	Motility test by hanging drop method	05
6	Antibiotics assay	05
7	Bacterial growth kinetics	10

## FLUID MECHANICS AND HEAT TRANSFER LABORATORY

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTP 403	Semester	4 <sup>th</sup>
Total Period:	45	Examination	4 hrs
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	50	End Semester Examination:	25

### List of experiments

Sr No	Name Of Experiment	No of Periods
1	Demonstrate operation of Reynolds's apparatus and find out critical velocity	05
2	Verify Bernoulli's equation	05
3	Demonstrate operation of venturimeter and determine the venturi co-efficient	05
4	Demonstrate operation of Orifice meter and determine the Orifice co-efficient	05
5	Demonstrate operation of a Rota meter and determine rate of flow through Rota meter	05
6	Demonstrate operation of a centrifugal pump and valves	05
7	Demonstrate operation of a fluidized bed column and packed bed column	05
8	Demonstrate heat transfer through composite wall and find the resistance of wall	05
9	Demonstrate operation of multi pass, horizontal heat exchanger and determine h & U	05

## IMMUNOLOGY LABORATORY

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTP 401	Semester	4 <sup>th</sup>
Total Period:	45	Examination	
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	25	End Semester Examination:	00

### List of experiments

Sl. No	Name of Experiment	No of Periods
1	Agglutination test for peripheral blood.	09
2	Ochterlony's diffusion test.	09
3	Rocket electrophoresis	09
4	Elisa test.	09
5	Presipitation reaction for Ag-Ab interaction	09

## FIELD STUDY/ TRAINING

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTP 405	Semester	4 <sup>th</sup>
Total Period:	45	Examination	4 hrs
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	50	End Semester Examination:	25

## SOFT SKILL LABORATORY-II

Name of the Course: Diploma in BIOTECHNOLOGY			
Course code:	BTP 406	Semester	4 <sup>th</sup>
Total Period:	45	Examination	
Lab. periods:	3 P/W	Term Work	25
Maximum marks:	25	End Semester Examination:	00

### Rationale :

After learning the basics of soft skill some more important soft skill techniques are included in this laboratory practice-II. The ability to develop and use soft skills can make the difference between the achiever and non - achiever. For years together the focus of management was on “Hard Skill”. The emphasis was centered on the technical skill necessary to effectively perform. These skills tended to be more job specific or more closely related to the actual task being performed. Today, employers want Managers with critical soft skills. These are skills key to effective performance across all job categories. These soft skills have come to play an even more crucial role in management positions in today’s environment.

### Objective:

On completion of Practice of Soft skill-1 the student should be able to:

1. understand meaning of soft skill and importance of it in their life.
2. Identify the strength, weakness, opportunity and treat to self.
3. Develop a positive attitude
4. Understand the core value of life and improve perception
5. Develop the art of listening and art of reading
6. Learn about time management

### Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Career Planning	03
2.	Art of speaking	12
3.	Art of writing	12
4.	Art of writing E-mail	06
5.	Body language	03
6.	Team Building and Teamwork	06
7.	Etiquette and manner	03
	Total	45

## **COURSE CONTENT:**

Classes should be divided into smaller groups of not more than twenty in each group

### **1.0 Career Planning**

- 1.1 Benefits of Career Planning
- 1.2 Guideline for choosing a career
- 1.3 Tips for Successful career planning
- 1.4 Developing Career Goal

Assignment- Write about your career objective, prepare a plan for career development.

### **2.0 Art of Speaking**

- 2.1 Special features of communication
- 2.2 Communication process, formal communication and informal communication
- 2.3 Tips for effective communication
- 2.4 Skill for powerful presentation
- 2.5 Art of public speaking

Assignment- Speak at least twice on two different topics.

### **3.0 Art of Writing**

- 3.1 Importance of writing
- 3.2 Creative writing, writing tips

Assignment- Practice on creative writing

### **4.0 Art of Writing E- Mail**

- 4.1 Concept of E mail communication
- 4.2 Use of proper salutations
- 4.3 Tips for improvement in using email

Assignment- Practice on email writing.

### **5.0 Body language**

- 5.1 Introduction to body language
- 5.2 Forms of body language, use of body language
- 5.3 Body language in building interpersonal relationship

5.4 Reason to study body language

Assignment- To be decided by teacher.

## **6.0 Team Building and Team work**

6.1 Aspects of team building

6.2 Skill needed for team work

6.3 A model of team building

6.4 Characteristic of effective team

Assignment- To be decided by teacher.

## **7.0 Etiquette and Manner**

7.1 Meaning of etiquette and manner

7.2 Modern etiquette and, benefits of etiquette

7.3 Concept of mannerism

7.4 Proper manner in different occasion

Assignment- To be decided by teacher.

### **LEARNING RESOURCES:**

<b>SL. NO.</b>	<b>AUTHOR'S NAME</b>	<b>TITLE OF BOOK</b>	<b>PUBLISHER</b>
<b>1.</b>	Dr K. Alex	Soft Skills, Second Edition	S. Chand