

**Detailed Course Scheme**  
**Bachelor of Science**  
**(Chemistry, Zoology, Biotechnology)**

**Semester-III**

**(2017-2020)**

**DOC201806110017**



**RNB GLOBAL UNIVERSITY**

RNB Global City, Ganganagar Road,  
Bikaner, Rajasthan 334601

## **OVERVIEW**

RNB Global University follows Semester System along with Choice Based Credit System as per latest guidelines of University Grants Commission (UGC). Accordingly, each academic year is divided into two semesters, **Odd (July-December) and Even (January-June)**. Also, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The curriculum for B.Sc. Program for (July-December) Odd Semester, 2018 along with examination pattern is as follows:

### **Course Scheme**

#### **Semester - III**

S. No.	Course Code	Course Name	L	T	P	Credits
1.	-	Discipline Specific Core Course-I Paper-III	4	0	0	4
2.	-	Discipline Specific Core Course-I Paper-III Lab	0	0	4	2
3.	-	Discipline Specific Core Course-II Paper-III	4	0	0	4
4.	-	Discipline Specific Core Course-II Paper-III Lab	0	0	4	2
5.	-	Discipline Specific Core Course-III Paper-III	4	0	0	4
6.	-	Discipline Specific Core Course-III Paper-III Lab	0	0	4	2
7.	13002900	Ability & Skill Enhancement Module - III	2	0	0	2
8.	13006200	Basic Instrumentation Skills	2	0	0	2
9.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
10.	99002800	Workshops & Seminars	-	-	-	1
<b>Total</b>			<b>16</b>	<b>0</b>	<b>12</b>	<b>24</b>

### **Discipline Specific Core Course Papers**

Subject	Course Code	Course Name
Chemistry	13001300	Chemistry-III
	13001400	Chemistry-III Lab

Zoology	13007500	Physiology and Bio Chemistry
	13007600	Physiology and Bio Chemistry Lab
Biotech	13007700	Genetics
	13007800	Genetics Lab

### **EVALUATION SCHEME - THEORY**

The evaluation of the theory paper of B.Sc. program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

#### **Internal Assessment**

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+ : 5 marks	5
<b>TOTAL</b>	<b>50</b>	

#### **External Assessment**

Type	Marks
Theory	50

## **EVALUATION SCHEME - PRACTICAL**

The evaluation of the practical paper of B.Sc. program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

### **Internal Assessment**

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	45
Attendance	75%+ : 5 marks	5
<b>TOTAL</b>	<b>50</b>	

### **External Assessment**

Type	Marks
Practical	50

## **CURRICULUM**

**Course Name: Chemistry III**

**Course Code: 13001300**

### **Course Outline**

#### **Unit I**

Solutions: Thermodynamics of ideal solutions: Ideal solutions and Raoult's law, deviations from Raoult's law – non-ideal solutions. Vapour pressure-composition and temperature composition curves of ideal and non-ideal solutions. Distillation of solutions, Lever rule. Azeotropes Partial miscibility of liquids: Critical solution temperature; effect of impurity on

partial miscibility of liquids. Immiscibility of liquids- Principle of steam distillation, Nernst distribution law and its applications, solvent extraction

## **Unit II**

Phase Equilibrium: Phases, components and degrees of freedom of a system, criteria of phase equilibrium. Gibbs Phase Rule and its thermodynamic derivation,. Derivation of Clausius – Clapeyron equation and its importance in phase equilibria. Phase diagrams of one-component systems (water and sulphur) and two component systems involving eutectics (lead-silver), congruent and incongruent melting points (FeCl<sub>3</sub>-H<sub>2</sub>O & Na-K only).

## **Unit III**

Conductance: Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Kohlrausch law of independent migration of ions. Transference number and its experimental determination using Hittorf and Moving boundary methods. Ionic mobility. Applications of conductance measurements: Conductometric titrations (only acid-base).

## **Unit IV**

Electrochemistry: Reversible and irreversible cells. Concept of EMF of a cell. Measurement of EMF of a cell. Nernst equation and its importance. Types of electrodes. Standard electrode potential. Electrochemical series. Thermodynamics of a reversible cell, calculation of thermodynamic properties:  $\Delta G$ ,  $\Delta H$  and  $\Delta S$  from EMF data. Calculation of equilibrium constant from EMF data..pH determination using hydrogen electrode and quinhydrone electrode. Potentiometric titrations -qualitative treatment (acid-base and oxidation-reduction only).

## **Unit V**

Organic Chemistry: Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.

**Carboxylic acids and their derivatives:** Carboxylic acids (aliphatic and aromatic)  
*Preparation:* Acidic and Alkaline hydrolysis of esters. *Reactions:* Hell – Vohlard - Zelinsky Reaction.

### **Carboxylic acid derivatives (aliphatic):**

*Preparation:* Acid chlorides, Anhydrides, Esters and Amides from acids and their inter conversion. *Reactions:* Comparative study of nucleophilicity of acyl derivatives. Reformatsky Reaction, Perkin condensation.

### **Amines and Diazonium Salts**

Amines (Aliphatic and Aromatic):

*Preparation:* from alkyl halides, Gabriel's Phthalimide synthesis, Hofmann Bromamide reaction.

*Reactions:* Hofmann vs. Saytzeff elimination, Carbylamines test, Hinsberg test, with HNO<sub>2</sub>, Schotten – Baumann Reaction. Electrophilic substitution (case aniline): nitration, bromination, sulphonation.

**Diazonium salts:** *Preparation:* from aromatic amines. *Reactions:* conversion to benzene, phenol, dyes.

## Unit VI

**Amino Acids, Peptides and Proteins:** *Preparation of Amino Acids:* Strecker synthesis using Gabriel's phthalimide synthesis. Zwitterion, Isoelectric point and Electrophoresis. *Reactions of Amino acids:* ester of  $-\text{COOH}$  group, acetylation of  $-\text{NH}_2$  group, complexation with  $\text{Cu}^{2+}$  ions, ninhydrin test. Overview of Primary, Secondary, Tertiary and Quaternary Structure of proteins. Determination of Primary structure of Peptides by degradation Edmann degradation (N-terminal) and C-terminal (thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (upto dipeptides) by N-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid-phase synthesis.

**Carbohydrates:** Classification, and General Properties, Glucose and Fructose (open chain and cyclic structure), Determination of configuration of monosaccharides, absolute configuration of Glucose and Fructose, Mutarotation, ascending and descending in monosaccharides. Structure of disaccharides (sucrose, cellobiose, maltose, lactose) and polysaccharides (starch and cellulose) excluding their structure elucidation.

## Suggested Readings

1. Barrow, G.M. *Physical Chemistry* Tata McGraw-Hill (2007).
2. Castellan, G.W. *Physical Chemistry* 4th Ed. Narosa (2004).
3. Kotz, J.C., Treichel, P.M. & Townsend, J.R. *General Chemistry*, Cengage Learning India Pvt. Ltd.: New Delhi (2009).
4. Mahan, B.H. *University Chemistry*, 3rd Ed. Narosa (1998).
5. Petrucci, R.H. *General Chemistry*, 5th Ed., Macmillan Publishing Co.: New York (1985).
6. Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
7. Finar, I. L. *Organic Chemistry (Volume 1 & 2)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
8. Nelson, D. L. & Cox, M. M. *Lehninger's Principles of Biochemistry 7th Ed.*, W. H. Freeman.
9. Berg, J.M., Tymoczko, J.L. & Stryer, L. *Biochemistry*, W.H. Freeman, 2002

**Course Name: Chemistry III Lab**

**Course Code 13001400**

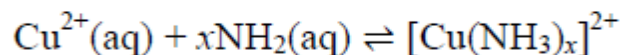
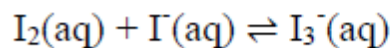
## Course Outline

### List of Experiments

#### **Section A: Physical Chemistry**

### **Distribution**

Study of the equilibrium of one of the following reactions by the distribution method:



### **Phase equilibria**

- a) Construction of the phase diagram of a binary system (simple eutectic) using cooling curves.
- b) Determination of the critical solution temperature and composition of the phenol water system and study of the effect of impurities on it.
- c) Study of the variation of mutual solubility temperature with concentration for the phenol water system and determination of the critical solubility temperature.

### **Conductance**

- I. Determination of cell constant
- II. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- III. Perform the following conductometric titrations:
  - a. Strong acid vs. strong base
  - b. Weak acid vs. strong base

### **Potentiometry**

Perform the following potentiometric titrations:

- i. Strong acid vs. strong base
- ii. Weak acid vs. strong base
- iii. Potassium dichromate vs. Mohr's salt

### **Section B: Organic Chemistry**

Systematic Qualitative Organic Analysis of Organic Compounds possessing mono functional groups (-COOH, phenolic, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative.

1. Separation of amino acids by paper chromatography
2. Determination of the concentration of glycine solution by formylation method.
3. Titration curve of glycine
4. Action of salivary amylase on starch
5. Effect of temperature on the action of salivary amylase on starch.
6. Differentiation between a reducing and a non-reducing sugar.

### **Suggested Readings:**

1. Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G.,
2. *Textbook of Practical Organic Chemistry*, Prentice-Hall, 5th edition, 1996.
3. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry* Orient-Longman, 1960.
4. Khosla, B. D.; Garg, V. C. & Gulati, A. *Senior Practical Physical Chemistry*, R. Chand & Co.: New Delhi (2011).
5. Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry*, Universities Press.

## **Course Name: Physiology and Biochemistry**

**Course Code: 13007500**

### **Course Outline:**

#### **Unit I: Nerve and muscle**

Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres, Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.

#### **Unit II: Digestion**

Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids.

#### **Unit III: Respiration**

Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbondioxide in blood.

#### **Unit IV: Excretion**

Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism.

#### **Unit V: Cardiovascular system**

Composition of blood, Hemostasis, Structure of Heart, Origin and conduction of the cardiac impulse, cardiac cycle.

#### **Unit VI: Reproduction and Endocrine Glands**

Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle Structure and function of pituitary, thyroid, Parathyroid, pancreas and adrenal.



### **Unit VII: Carbohydrate Metabolism**

Glycolysis, Krebs Cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogen metabolism, Review of electron transport chain.

### **Unit VIII: Lipid Metabolism**

Biosynthesis and  $\beta$  oxidation of palmitic acid.

### **Unit IX: Protein metabolism**

Transamination, Deamination and Urea Cycle.

### **Unit X Enzymes**

Introduction, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation.

### **Suggested Readings**

1. Tortora, G.J. and Derrickson, B.H. (2009). Principles of Anatomy and Physiology, XII Edition, John Wiley & Sons, Inc.
2. Widmaier, E.P., Raff, H. and Strang, K.T. (2008) Vander's Human Physiology, XI Edition., McGraw Hill.
3. Guyton, A.C. and Hall, J.E. (2011). Textbook of Medical Physiology, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company.
4. Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). Biochemistry. VI Edition. W.H Freeman and Co.
5. Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). Principles of Biochemistry. IV Edition. W.H. Freeman and Co.
6. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). Harper's Illustrated Biochemistry. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.

## **Course Name: Physiology and Biochemistry Lab**

**Course Code: 13007600**

### **Course Outline**

#### **List of Experiments**

1. Preparation of hemin and hemochromogen crystals.
2. Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland.
3. Study of permanent slides of spinal cord, duodenum, liver, lung, kidney, bone, cartilage.

4. Qualitative tests to identify functional groups of carbohydrates in given solutions (Glucose, Fructose, Sucrose, Lactose) 2. Estimation of total protein in given solutions by Lowry's method.
5. Study of activity of salivary amylase under optimum conditions.

### **Suggested Readings**

1. Tortora, G.J. and Derrickson, B.H. (2009). Principles of Anatomy and Physiology, XII Edition, John Wiley & Sons, Inc.
2. Widmaier, E.P., Raff, H. and Strang, K.T. (2008) Vander's Human Physiology, XI Edition., McGraw Hill.
3. Guyton, A.C. and Hall, J.E. (2011). Textbook of Medical Physiology, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company.

## **Course Name: Genetics**

## **Course Code: 13007700**

### **Course Outline:**

#### **Unit I: Introduction**

Historical developments in the field of genetics. Organisms suitable for genetic experimentation and their genetic significance. Cell Cycle: Mitosis and Meiosis: Control points in cell-cycle progression in yeast. Role of meiosis in life cycles of organisms.

Mendelian genetics: Mendel's experimental design, monohybrid, di-hybrid and tri hybrid crosses, Law of segregation & Principle of independent assortment. Verification of segregates by test and back crosses, Chromosomal theory of inheritance, Allelic interactions: Concept of dominance, recessiveness, incomplete dominance, co-dominance, semi-dominance, pleiotropy, multiple allele, pseudo-allele, essential and lethal genes, penetrance and expressivity.

#### **Unit II: Non allelic interactions**

Interaction producing new phenotype complementary genes, epistasis(dominant & recessive), duplicate genes and inhibitory genes. Chromosome and genomic organization: Eukaryotic nuclear genome nucleotide sequence composition –unique & repetitive DNA, satellite DNA. Centromere and telomere DNA sequences, middle repetitive sequences-VNTRs & dinucleotide repeats, repetitive transposed sequences- SINEs & LINEs, middle repetitive multiple copy genes, non coding DNA.

Genetic organization of prokaryotic and viral genome. Structure and characteristics of bacterial and eukaryotic chromosome, chromosome morphology, concept of euchromatin and heterochromatin. packaging of DNA molecule into chromosomes, chromosome

banding pattern, karyotype, giant chromosomes, one gene one polypeptide hypothesis, concept of cistron, exons, introns, genetic code, gene function.

### **Unit III: Chromosome and gene mutations:**

Definition and types of mutations, causes of mutations, Ames test for mutagenic agents, screening procedures for isolation of mutants and uses of mutants, variations in chromosomes structure - deletion, duplication, inversion and translocation (reciprocal and Robertsonian), position effects of gene expression, chromosomal aberrations in human beings, abnormalities - Aneuploidy and Euploidy.

Sex determination and sex linkage: Mechanisms of sex determination, Environmental factors and sex determination, sex differentiation, Barr bodies, dosage compensation, genetic balance theory, Fragile-X syndrome and chromosome, sex influenced dominance, sex limited gene expression, sex linked inheritance.

### **Unit IV**

Genetic linkage, crossing over and chromosome mapping: Linkage and Recombination of genes in a chromosome crossing over, Cytological basis of crossing over, Molecular mechanism of crossing over, Crossing over at four strand stage, Multiple crossing overs Genetic mapping.

Extra chromosomal inheritance: Rules of extra nuclear inheritance, maternal effects, maternal inheritance, cytoplasmic inheritance, organelle heredity, genomic imprinting.

### **Unit V : Evolution and population genetics**

In breeding and out breeding, Hardy Weinberg law (prediction, derivation), Selective advantage and Hardy Weinberg equation, allelic and genotype frequencies, changes in allelic frequencies, systems of mating, evolutionary genetics, natural selection. Genetics; Pedigrees - gathering family history, pedigree symbols, construction of pedigrees; Monogenic traits - autosomal inheritance - dominant and recessive; Sex-linked inheritance - dominant and recessive; Sex-limited and sex-influenced traits; Y-linked.

### **Suggested Readings**

1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (2006). Principles of Genetics. VIII Edition John Wiley & Sons.
2. Snustad, D.P., Simmons, M.J. (2009). Principles of Genetics. V Edition. John Wiley and Sons Inc.
3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009). Concepts of Genetics. IX Edition. Benjamin Cummings.
4. Russell, P. J. (2009). Genetics - A Molecular Approach. III Edition. Benjamin Cummings.
5. Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. IX Edition. Introduction to Genetic Analysis, W. H. Freeman & Co.

## **Course Name: Genetics Lab**

**Course Code: 13007800**

### **Course Outline**

#### **List of Experiments**

1. Permanent and temporary mount of mitosis.
2. Permanent and temporary mount of meiosis.
3. Mendelian deviations in dihybrid crosses.
4. Demonstration of - Barr Body -Rhoeo translocation.
5. Karyotyping with the help of photographs
6. Pedigree charts of some common characters like blood group, color blindness and PTC tasting.
7. Study of polyploidy in onion root tip by colchicine treatment.

#### **Suggested Readings**

1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (2006). Principles of Genetics. VIII Edition John Wiley & Sons. 2. Snustad, D.P., Simmons, M.J. (2009).
2. Principles of Genetics. V Edition. John Wiley and Sons Inc. 3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009).
3. Concepts of Genetics. IX Edition. Benjamin Cummings. 4. Russell, P. J. (2009).
4. Genetics- A Molecular Approach. III Edition. Benjamin Cummings. 5. Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. IX Edition. Introduction to Genetic Analysis, W. H. Freeman & Co

## **Course Name: Basic Instrumentation Skills**

**Course Code: 13006200**

### **Course Outline:**

#### **Unit I: Basic of Measurement**

Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. **Multimeter:** Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

#### **Unit II: Electronic Voltmeter**

Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only).

Specifications of an electronic Voltmeter/ Multimeter and their significance. **AC millivoltmeter:** Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

### **Unit III: Cathode Ray Oscilloscope**

Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only- no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance.

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working.

### **Unit IV: Signal Generators and Analysis Instruments**

Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

### **Unit V: Impedance Bridges & Q-Meters**

Block diagram of bridge. Working principles of basic (balancing type) RLC bridge. Specifications of RLC Bridge. Block diagram & working principles of a Q- Meter. Digital LCR bridges.

### **Unit VI: Digital Instruments**

Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

### **Unit VII: Digital Multimeter**

Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution.

### **The test of lab skills will be of the following test items:**

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment.
4. Use of Digital multimeter/VTVM for measuring voltages.
5. Circuit tracing of Laboratory electronic equipment,
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit.
9. Balancing of bridges.

### **Laboratory Exercises:**

1. To observe the loading effect of a multimeter while measuring voltage across low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

### **Open Ended Experiments:**

1. Using a Dual Trace Oscilloscope
2. Converting the range of a given measuring instrument (voltmeter, ammeter)

### **Suggested Readings**

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.
5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S. Kumar, 3rd Ed., 2012, Tata McGraw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk,2008, Springer.
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

**Course Name: Ability & Skill Enhancement Module III**

**Course Code: 13002900**

**Course Outline - Final Assessment - Preparing a documentary**

**Unit I: Book & Movie Reviews**

What is Book Review, Purpose & Importance of Book Review, Types of Book Review, Elements & Steps of Writing Book Review, What is Movie Review, Purpose & Importance of Movie Review, Types of Movie Review, Elements & Steps of Writing Movie Review.

**Unit II: LSWR Skills**

Reading Comprehension, Rewriting Mythology/Folklore, Debate, News Analysis, Role Plays.

**Unit III: Emotional Intelligence & Handling Emotions**

What is emotional intelligence, E.Q. Tests, performing under pressure, how to take right decisions under pressure keeping balance in difficult emotional situations. The science of emotional intelligence, characteristics of emotional intelligence, Emotions handling- identifying good and bad emotions, how to control emotions, how to manage negative emotions keeping balance of mental stability, stress and distress.

**Unit IV: Group Discussion Skills**

What is GD, Types of Group Discussions, Do's & Don'ts, Participation, Thinking, Structuring, Group Behaviour, Leadership Skills, Interpersonal Skills, Persuasive Skills, Conceptualization Skills.

**Unit V: Documentary Making**

What is documentary, aims & objectives, documentary for social cause, Documentary/Movie Screening & Reviews, preparing a documentary, Narration.

**Note:** The review of Syllabus happens on periodic basis for the benefit of the students. In case there are changes in curriculum due to review, students would be intimated in writing.

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