

Detailed Course Scheme
Bachelor of Science (B.Sc.)
(Physics, Mathematics, Chemistry, Botany,
Zoology,
Biotechnology and Computer Sciences)

Semester- VI
(2016-2019)

DOC201807020031



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 (January-June) Even Semester, 2019 along with examination pattern is as follows:

Course Scheme

Semester - VI

S. No	Course Code	Course Name	L	T	P	Credits
1	-	Discipline Specific Core Course-I Elective I	4	0	0	4
2.	-	Discipline Specific Core Course-I Elective I Lab	0	0	4	2
3.	-	Discipline Specific Core Course-II Elective I	4	0	0	4
4.	-	Discipline Specific Core Course-II Elective I Lab	0	0	4	2
5.	-	Discipline Specific Core Course-III Elective I	4	0	0	4
6.	-	Discipline Specific Core Course-III Elective I Lab	0	0	4	2
7.	13015600	Intellectual Property Rights	2	0	0	2
8.	13015700	Dissertation	6	0	0	6
9.	13003200	Ability & Skill Enhancement Module - VI	2	0	0	2
10.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
11.	99002800	Workshops & Seminars	-	-	-	1
Total			22	0	12	30

Discipline Specific Core Course Papers

Subject	Course Code	Course Name
Physics	13009500	Solid State Physics
	13009600	Solid State Physics Lab
Chemistry	13009700	Organometallics, Bioinorganic chemistry, Polynuclear, hydrocarbons and UV, IR Spectroscopy
	13009800	Organometallics, Bioinorganic chemistry, Polynuclear, hydrocarbons and UV, IR Spectroscopy Lab
Mathematics	13007200	Matrices
Botany	13014800	Economic Botany and Biotechnology
	13014900	Economic Botany and Biotechnology Lab
Zoology	13015000	Environmental Biotechnology
	13015100	Environmental Biotechnology Lab
Computer Science	13015200	Software Engineering
	13015300	Software Engineering Lab
Biotechnology	13015400	Genomics and Proteomics
	13015500	Genomics and Proteomics Lab

- Lab would be same as per theory elective paper opted by the student.

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
TOTAL	50	

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
TOTAL	50	

External Assessment

Type	Marks
Practical	50

CURRICULUM

Course Name: Solid State Physics

Course Code: 13009500

Course Outline

Unit I: Crystal Structure Solids

Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis – Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals .Bragg’s Law. Atomic and Geometrical Factor

Unit II: Elementary Lattice Dynamics

Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solid. Dulong and Petit’s Law, Einstein and Debye theories of specific heat of solids T³ law

Unit III: Magnetic Properties of Matter

Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia – and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie’s law, Weiss’s Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss.

Unit IV : Dielectric Properties of Materials

Polarization. Local Electric Field at an Atom. Depolarization Field.Electric Susceptibility. Polarizability.ClausiusMosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion.Cauchy and Sellmeir relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons

Elementary band theory: Kronig Penny model. Band Gaps. Conductors, Semiconductors and insulators. P and N type Semiconductors. Conductivity of Semiconductors, mobility, Hall Effect, Hall coefficient.

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect.

Suggested Readings:

1. Introduction to Solid State Physics, Charles Kittel, 8th Ed., 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata McGraw Hill
4. Solid State Physics, Neil W. Ashcroft and N. David Mermin, 1976, Cengage Learning
5. Solid State Physics, Rita John, 2014, McGraw Hill
6. Solid-state Physics, H. I bach and H Luth, 2009, Springer
7. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India • Solid State Physics, M.A. Wahab, 2011, Narosa Publications

Course Name: Solid State Physics Lab

Course Code: 13009600

Course Outline

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)
6. To determine the refractive index of a dielectric layer using SPR
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To draw the BH curve of iron using a Solenoid and determine the energy loss from Hysteresis.
9. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four probe method (from room temperature to 150 o C) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Suggested Readings

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.

2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, InduPrakash and Ramakrishna, 11th Ed., 2011, KitabMahal, New Delhi
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

Course Name: Organometallics, Bioinorganic Chemistry, Polynuclear, Hydrocarbons and UV, IR Spectroscopy

Course Code: 13009700

Course Outline

Section A:

Unit I

Chemistry of 3d metals Oxidation states displayed by Cr, Fe, Co, Ni and Co. A study of the following compounds (including preparation and important properties); Peroxo compounds of Cr, $K_2Cr_2O_7$, $KMnO_4$, $K_4[Fe(CN)_6]$, sodium nitroprusside, $[Co(NH_3)_6]Cl_3$, $Na_3[Co(NO_2)_6]$.

Unit II

Organometallic Compounds Definition and Classification with appropriate examples based on nature of metal carbon bond (ionic, s, p and multicentre bonds). Structures of methyl lithium, Zeiss salt and ferrocene. EAN rule as applied to carbonyls. Preparation, structure, bonding and properties of mononuclear and poly nuclear carbonyls of 3d metals p-acceptor behaviour of carbon monoxide. Synergic effects (VB approach)- (MO diagram of CO can be referred to for synergic effect to IR frequencies).

Unit III

Bio-Inorganic Chemistry A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na^+ , K^+ and Mg^{2+} ions: Na/K pump; Role of Mg^{2+} ions in energy production and chlorophyll. Role of Ca^{2+} in blood clotting, stabilization of protein structures and structural role (bones).

Section B:

Unit IV

Polynuclear and heteronuclear aromatic compounds: 95 Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine.

Unit V

Active methylene compounds: Preparation: Claisen ester condensation. Keto-enol tautomerism. Reactions: Synthetic uses of ethylacetoacetate (preparation of non-heteromolecules having upto 6 carbon).

Unit VI

Application of Spectroscopy to Simple Organic Molecules Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λ_{\max} & ϵ_{\max} , chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λ_{\max} of conjugated dienes and α, β - unsaturated compounds. Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions).

Suggested Readings

1. James E. Huheey, Ellen Keiter & Richard Keiter: Inorganic Chemistry: Principles of Structure and Reactivity, Pearson Publication.
2. G.L. Miessler & Donald A. Tarr: Inorganic Chemistry, Pearson Publication.
3. J.D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
4. F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley & Sons.
5. I.L. Finar: Organic Chemistry (Vol. I & II), E.L.B.S.
6. John R. Dyer: Applications of Absorption Spectroscopy of Organic Compounds, Prentice Hall.
7. R.M. Silverstein, G.C. Bassler & T.C. Morrill: Spectroscopic Identification of Organic Compounds, John Wiley & Sons.
8. R.T. Morrison & R.N. Boyd: Organic Chemistry, Prentice Hall.
9. Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
10. Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

Course Name: Organometallics, Bioinorganic Chemistry, Polynuclear, Hydrocarbons and UV, IR Spectroscopy Lab

Course Code: 13009800

Course Outline

Section A: Inorganic Chemistry

1. Separation of mixtures by chromatography: Measure the R_f value in each case. (Combination of two ions to be given) Paper chromatographic separation of Fe^{3+} , Al^{3+} and Cr^{3+} or Paper chromatographic separation of Ni^{2+} , Co^{2+} , Mn^{2+} and Zn^{2+}

2. Preparation of any two of the following complexes and measurement of their conductivity: (i) tetra ammine carbonato cobalt (III) nitrate (ii) tetraamminecopper (II) sulphate (iii) potassium trioxalatoferrate (III) trihydrate Compare the conductance of the complexes with that of M/1000 solution of NaCl, MgCl₂ and LiCl₃.

Section B: Organic Chemistry

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

Suggested Readings

1. A.I. Vogel: Qualitative Inorganic Analysis, Prentice Hall, 7th Edn.
2. A.I. Vogel: Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
3. Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.
4. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry Orient-Longman, 1960.

Course Name: Matrices

Course Code: 13007200

Course Outline:

Unit I

R, R₂, R₃ as vector spaces over R. Standard basis for each of them. Concept of Linear Independence and examples of different bases. Subspaces of R₂, R₃

Unit II

Translation, Dilation, Rotation, Reflection in a point, line and plane. Matrix form of basic geometric transformations. Interpretation of eigen values and eigen vectors for such transformations and eigen spaces as invariant subspaces.

Unit III

Types of matrices. Rank of a matrix. Invariance of rank under elementary transformations. Reduction to normal form, Solutions of linear homogeneous and non-homogeneous equations with number of equations and unknowns upto four.

Unit IV

Matrices in diagonal form. Reduction to diagonal form up to matrices of order 3. Computation of matrix inverses using elementary row operations. Rank of matrix. Solutions of a system of linear equations using matrices. Illustrative examples of above concepts from Geometry, Physics, Chemistry, Combinatorics and Statistics.

Suggested Readings

1. A.I. Kostrikin, Introduction to Algebra, Springer Verlag, 1984
2. S. H. Friedberg, A. L. Insel and L. E. Spence, Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2004
3. Richard Bronson, Theory and Problems of Matrix Operations, Tata McGraw Hill, 1989

Course Name: Economic Botany and Biotechnology

Course Code: 13014800

Course outline:

Unit I: Origin of Cultivated Plants

Concept of centres of origin, their importance with reference to Vavilov's work.

Unit II: Cereals

Wheat -Origin, morphology, uses.

Unit III: Legumes

General account with special reference to Gram and soybean.

Unit IV: Spices

General account with special reference to clove and black pepper (Botanical name, family, part used, morphology and uses).

Unit V: Beverages

Tea (morphology, processing, uses).

Unit VI: Oils and Fats

General description with special reference to groundnut.

Unit VII: Fibre Yielding Plants

General description with special reference to Cotton (Botanical name, family, part used, morphology and uses).

Unit VIII: Introduction to Biotechnology:

Unit IX: Plant tissue culture

Micropropagation; haploid production through androgenesis and gynogenesis; brief account of embryo & endosperm culture with their applications.

Unit X: Recombinant DNA Techniques

Blotting techniques: Northern, Southern and Western Blotting, DNA Fingerprinting; Molecular DNA markers i.e. RAPD, RFLP, SNPs; DNA sequencing, PCR and Reverse Transcriptase-PCR. Hybridoma and monoclonal antibodies, ELISA and Immuno- detection. Molecular diagnosis of human disease, Human gene Therapy.

Suggested Readings

1. Kochhar, S.L. (2011). Economic Botany in the Tropics, MacMillan Publishers India Ltd., New Delhi. 4th edition.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.

Course Name: Economic Botany and Biotechnology Lab

Course Code: 13014900

Course Outline

1. Study of economically important plants : Wheat, Gram, Soybean, Black pepper, Clove Tea, Cotton, Groundnut through specimens, sections and micro chemical tests
2. Familiarization with basic equipment in tissue culture.
3. Study through photographs: Anther culture, somatic embryogenesis, endosperm and embryo culture; micro propagation.
4. Study of molecular techniques: PCR, Blotting techniques, AGE and PAGE.

Course Name: Environmental Biotechnology

Course Code: 13015000

Course Outline

Unit I

Conventional fuels and their environmental impact – Firewood, Plant, Animal, Water, Coal and Gas. Modern fuels and their environmental impact – Methanogenic bacteria, Biogas, Microbial hydrogen Production, Conversion of sugar to alcohol Gasohol.

Unit II

Bioremediation of soil & water contaminated with oil spills, heavy metals and detergents. Degradation of lignin and cellulose using microbes. Phyto-remediation. Degradation of pesticides and other toxic chemicals by micro-organisms- degradation aromatic and chlorinated hydrocarbons and petroleum products.

Unit III

Treatment of municipal waste and Industrial effluents. Bio-fertilizers. Role of symbiotic and a symbiotic nitrogen fixing bacteria in the enrichment of soil. Algal and fungal bio fertilizers (VAM).

Unit IV

Bioleaching, Enrichment of ores by microorganisms (Gold, Copper and Uranium). Environmental significance of genetically modified microbes, plants and animals.

Suggested Readings

1. Environmental Science, S.C. Santra
2. Environmental Biotechnology, Pradipta Kumar Mohapatra
3. Environmental Biotechnology – Concepts and Applications, Hans-Joachim Jordening and Josef Winter
4. Waste Water Engineering, Metcalf and Eddy, Tata McGraw hill
5. Agricultural Biotechnology, S.S. Purohit
6. Environmental Microbiology : Methods and Protocols, Alicia L. Ragout De Spencer, John F.T. Spencer
7. Introduction to Environmental Biotechnology, Milton Wainwright
8. Principles of Environmental Engineering, Gilbert Masters
9. Wastewater Engineering – Metcalf & Eddy

Course Name: Environmental Biotechnology Lab

Course Code: 13015100

Course Outline

Practicals

1. Calculation of Total Dissolved Solids (TDS) of water sample.
2. Calculation of BOD of water sample.
3. Calculation of COD of water sample.
4. Bacterial Examination of Water by MPN Method

Course Name: Software Engineering

Course Code: 13015200

Course Outline

Unit I : Introduction

The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Software Engineering as a Layered Technology, Software Process Framework, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI).

Unit II: Requirement Analysis

Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modeling Techniques, Flow Oriented Modeling, Need for SRS, Characteristics and Components of SRS.

Unit III: Software Project Management

Estimation in Project Planning Process, Project Scheduling

Unit IV: Risk Management

Software Risks, Risk Identification, Risk Projection and Risk Refinement, RMMM Plan.

Unit V: Quality Management

Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects.

Unit VI: Design Engineering

Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Modeling Component Level Design.

Unit VII: Testing Strategies & Tactics

Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing.

Suggested Readings

1. R.S. Pressman, Software Engineering: A Practitioner's Approach (7th Edition), McGrawHill, 2009.
2. P. Jalote, An Integrated Approach to Software Engineering (2nd Edition), Narosa Publishing House, 2003.

3. K.K. Aggarwal and Y. Singh, Software Engineering (2nd Edition), New Age International Publishers, 2008.
4. Sommerville, Software Engineering (8th edition), Addison Wesley, 2006.
5. D. Bell, Software Engineering for Students (4th Edition), Addison-Wesley, 2005.
6. R. Mall, Fundamentals of Software Engineering (2nd Edition), Prentice-Hall of India, 2004.

Course Name: Software Engineering Lab

Course Code: 13015300

Course Outline

- Problem Statement.
- Process Model

Requirement Analysis:

- Creating a Data Flow
- Data Dictionary, Use Cases

Project Management:

Computing FP

- Effort
- Schedule, Risk Table, Timeline chart

Design Engineering:

- Architectural Design
- Data Design, Component Level Design

Testing:

- Basis Path Testing

Sample Projects:

1. Criminal Record Management: Implement a criminal record management system for jailers, police officers and CBI officers
2. DTC Route Information: Online information about the bus routes and their frequency and fares.
3. Car Pooling: To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System

Course Name: Genomics & Proteomics

Course Code: 13015400

Course Outline

Unit I

Introduction to Genomics, DNA sequencing methods – manual & automated: Maxam& Gilbert and Sangers method. Pyrosequencing, Genome Sequencing: Shotgun & Hierarchical (clone contig) methods, Computer tools for sequencing projects: Genome sequence assembly software.

Unit II

Managing and Distributing Genome Data: Web based servers and softwares for genome analysis: ENSEMBL, VISTA, UCSC Genome Browser, NCBI genome. Selected Model Organisms' Genomes and Databases.

Unit III

Introduction to protein structure, Chemical properties of proteins. Physical interactions that determine the property of proteins. Short-range interactions, electrostatic forces, van der waal interactions, hydrogen bonds, Hydrophobic interactions. Determination of sizes (Sedimentation analysis, gel filtration, SDS-PAGE); Native PAGE, Determination of covalent structures – Edman degradation.

Unit IV

Introduction to Proteomics, Analysis of proteomes.2D-PAGE. Sample preparation, solubilization, reduction, resolution. Reproducibility of 2D-PAGE. Mass spectrometry based methods for protein identification. De novo sequencing using mass spectrometric data.

Suggested Readings

1. Genes IX by Benjamin Lewin, Johns and Bartlett Publisher, 2006.
2. Modern Biotechnology, 2nd Edition, S.B. Primrose, Blackwell Publishing, 1987.
3. Molecular Cloning: A Laboratory Manual (3rd Edition) Sambrook and Russell Vol. I to III, 1989.
4. Principles of Gene Manipulation 6th Edition, S.B.Primrose, R.M.Twyman and R.W. Old. Blackwell Science, 2001.
5. Genetics- A Molecular Approach. III Edition. Benjamin Cummings.
6. Pevsner, J. (2009). Bioinformatics and Functional Genomics. II Edition. John Wiley & Sons.

Course Name: Genomics & Proteomics Lab

Course Code: 13015500

Course Outline

1. Use of SNP databases at NCBI and other sites
2. Use of OMIM database
3. Detection of Open Reading Frames using ORF Finder
4. Proteomics 2D PAGE database
5. Softwares for Protein localization.
6. Hydropathy plots
7. Native PAGE
8. SDS-PAGE

Course Name: Intellectual Property Rights

Course Code: 13015600

Course Outline

Introduction to Intellectual Property:

Historical Perspective, Different Types of IP, Importance of protecting IP.

Copyrights

Introduction, How to obtain, Differences from Patents.

Trade Marks

Introduction, How to obtain, Different types of marks – Collective marks, certification marks, service marks, Trade names, etc. Differences from Designs.

Patents

Historical Perspective, Basic and associated right, WIPO, PCT system, Traditional Knowledge, Patents and Healthcare – balancing promoting innovation with public health, Software patents and their importance for India.

Geographical Indications

Definition, rules for registration, prevention of illegal exploitation, importance to India.

Industrial Designs

Definition, How to obtain, features, International design registration.

Layout design of integrated circuits

Circuit Boards, Integrated Chips, Importance for electronic industry.

Trade Secrets

Introduction and Historical Perspectives, Scope of Protection, Risks involved and legal aspects of Trade Secret Protection.

Different International agreements

(a) World Trade Organization (WTO):

- i. General Agreement on Tariffs & Trade (GATT), Trade Related Intellectual Property Rights (TRIPS) agreement
- ii. General Agreement on Trade related Services (GATS)
- iii. Madrid Protocol
- iv. Berne Convention
- v. Budapest Treaty

(b) Paris Convention

WIPO and TRIPS, IPR and Plant Breeders Rights, IPR and Biodiversity

IP Infringement issue and enforcement – Role of Judiciary, Role of law enforcement agencies – Police, Customs etc Economic Value of Intellectual Property– Intangible assets and their valuation, Intellectual Property in the Indian Context –Various laws in India Licensing and technology transfer.

Suggested Readings:

1. N.K. Acharya: *Textbook on intellectual property rights*, Asia Law House(2001).
2. Manjula Guru & M.B. Rao, *Understanding Trips: Managing Knowledge in Developing Countries*, Sage Publications (2003).
3. P. Ganguli, *Intellectual Property Rights: Unleashing the Knowledge Economy*, Tata McGraw-Hill (2001).
4. Arthur Raphael Miller, MichealH.Davis; *Intellectual Property: Patents, Trademarks and Copyright in a Nutshell*, West Group Publishers (2000).
5. JayashreeWatal, *Intellectual property rights in the WTO and developing countries*, Oxford University Press, Oxford.

Course Name: Ability and Skill Enhancement VI

Course Code: 13003200

Course Outline – Final Assessment – Report/Presentation

Unit I: Verbal Reasoning & English Aptitude

Logical Sequence of Words, Verbal Analogy, Classification, Blood Relation Test, Syllogism, Reading Comprehension.

Unit II: Winning Attitude

Attitude is the most important thing for success, how to develop a winning attitude, what is it, when we need it, what is mindset, how to have a winning and positive mindset, how to win in difficult situations, Positive thinking, passion, dedication, confidence, well preparation, focus, hard work, planning, never give up, etc - some traits that help in developing winning attitude.

Unit III: Understanding the News

Reading Current News, Comparing & Analysing the news, Write an editorial, News Vocabulary, Presentation on any major news (political/social/sports/economics).

Unit IV: Be a Journalist

Chat Show, Panel Discussion, Parliamentary debate, News Inspired Theatrical Performance.

Unit V: Report

Preparing a report on major National/International News – Insights/ review of major news papers and news channels.

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.

----- End of document-----