

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Chemistry

SYLLABUS FOR 3rd Sem PROGRAMME

Fundamentals of Chemistry-I (11105201)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme				Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/	Lab Hrs/	Credit	External		Internal			
				T	P	T	CE	P	
3	-	-	3	60	-	20	20	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>Unit I: Acids and Bases:</b> Arrhenius Concept, Lowry-Bronsted Acid-Base Concept, Solvent System Concept, Usanovich Concept, Luxflood Concept, Lewis Acid-Base Concept, Relative strengths of acids and bases: Effect of solvent, Levelling effect, Effect of substituents, Pearson's Soft and Hard Acid-Base Principle (HSAB), Applications of HSAB Principle	30%	12
2	<b>Unit II: Alcohols:</b> <i>Monohydric alcohols:</i> Nomenclature, methods of preparation, Hydrogen bonding, acidic nature, reactions of 1o alcohols. <i>Dihydric Alcohols:</i> Nomenclature, methods of preparation, chemical reactions of vicinal glycols. <i>Trihydric Alcohols:</i> Nomenclature, methods of preparation, Chemical reactions of glycerol. Nomenclature, structure and bonding, Preparation of phenols (Dow's and Cumene method), physical properties and acidic character. Comparative acidic strength of alcohols and phenols, stabilization of phenoxide ion. Physical properties of phenols. Chemical properties of phenols.	40%	20
3	<b>Unit III: Gaseous state:</b> Gas Laws: Boyle's Law, Charles's Law, Gay lussac's Law, Graham's Law of diffusion of gases, Avogadro's Law and Dalton's law of partial pressure. Ideal gas equation, combined gas equation. Application of gas laws. <i>Kinetic Theory of gases:</i> Postulates of kinetic theory of gases, deviation from ideal behavior, Vander Waals equation of state.	30%	13

\*Continuous Evaluation:

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**

1. Concise Inorganic Chemistry by  
J. D. Lee
2. Inorganic Chemistry  
Puri and Sharma
3. Principle of Physical Chemistry  
Puri, Sharma and Pathania
4. A Text Book of Organic Chemistry  
Arun Bahl and B.S. Bahl; Sultan Chand & Sons, New Delhi
5. Organic Chemistry  
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# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Chemistry

SYLLABUS FOR 3rd Sem B.Sc. PROGRAMME

Fundamentals of Chemistry-II (11105202)

Type of Course: B.Sc.

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/	Lab Hrs/		External		T	Internals		
			T	P	CE		P		
3	-	-	3	60	-	20	20	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>Unit I: Non-Aqueous Solvents:</b> Classification of Solvents, General Properties of Ionizing Solvents, Liquid NH <sub>3</sub> as Non-aqueous Solvent, Chemical reactions in Liquid NH <sub>3</sub> , Solutions of alkali metals in liquid NH <sub>3</sub> , Merits and Demerits of Liquid NH <sub>3</sub> as Solvent, Liquid SO <sub>2</sub> as a solvent. Reactions in liquid SO <sub>2</sub> , Liquid Hydrogen Fluoride. Molten salts as non-aqueous solvents.	33%	15
2	<b>Unit II: Aldehydes and Ketones:</b> Nomenclature of aldehydes and ketones. Structure of the carbonyl group, synthesis of aldehydes and ketones. Physical properties. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin condensation, aldol condensation, Perkin reaction and Knoevenagel reaction, Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction.	34%	15
3	<b>Unit III: Catalysis:</b> Characteristics of catalysed reactions, classification of catalysis homogeneous and heterogeneous catalysis, Promoters, catalyst poison. Enzyme catalysis. Kinetics of enzyme catalysed reactions and Michealis-Menton equation. Applications of catalysts.	33%	15

**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**

1. A Text Book of Organic Chemistry  
Arun Bahl and B.S. Bahl; Sultan Chand & Sons, New Delhi
2. Inorganic Chemistry  
J D Lee

3. Principles of Inorganic Chemistry  
B. R. Puri, L. R. Sharma ; K. C. Kalia; S Chand and Company
4. Physical chemistry  
PC Rakshit
5. Organic Chemistry by  
Morrison and Boyd

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Chemistry

SYLLABUS FOR 3rd Sem PROGRAMME

Lab-1 (Organic spotting) (11105203)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/	Tut Hrs/	Lab Hrs/		External		T	Interna I	P	
			T	P	CE				
-	-	2	2	-	30	-	-	20	50

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	Identification of elements and Analysis of functional groups of organic compounds: 1. Salicylic acid	%	3
2	Identification of elements and Analysis of functional groups of organic compounds: p-Nitroaniline	%	3
3	Identification of elements and Analysis of functional groups of organic compounds: m-Nitroaniline	%	3
4	Identification of elements and Analysis of functional groups of organic compounds: o-Nitroaniline	%	3
5	Identification of elements and Analysis of functional groups of organic compounds: Thiourea	%	3
6	Identification of elements and Analysis of functional groups of organic compounds: Resorcinol	%	3
7	Identification of elements and Analysis of functional groups of organic compounds: p-Toludine	%	3

8	<b>Identification of elements and Analysis of functional groups of organic compounds:</b> p-Nitrophenol	%	3
9	<b>Identification of elements and Analysis of functional groups of organic compounds:</b> m-Dinitrobenzene	%	3
10	<b>Identification of elements and Analysis of functional groups of organic compounds:</b> phthalic acid	%	3

**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Chemistry

SYLLABUS FOR 3rd Sem PROGRAMME

Lab-2 (Volumetric estimation) (11105204)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/	Tut Hrs/	Lab Hrs/		External		T	Intern	P	
			T	P	CE				
-	-	2	2	-	30	-	-	20	50

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>Volumetric estimation:</b> To estimate the amount of Cu <sup>2+</sup> and CuSO <sub>4</sub> .5H <sub>2</sub> O in the given solution using iodometry	%	3
2	<b>Volumetric estimation:</b> To estimate the amount of Fe <sup>3+</sup> and FeCl <sub>3</sub> .6H <sub>2</sub> O in given solution using internal and external indicators	%	3
3	<b>Volumetric estimation:</b> To determine amount of Ca <sup>2+</sup> and Mg <sup>2+</sup> in given sample using complexometric titration	%	3
4	<b>Volumetric estimation:</b> To estimate amount of chloride ions in given sample of Mohr's and Fajan's method.	%	3
5	<b>Volumetric estimation:</b> To determine amount of Zn <sup>2+</sup> and ZnSO <sub>4</sub> by complexometric titration	%	3

**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Physics

SYLLABUS FOR 3rd Sem PROGRAMME

Electronics (11104201)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/	Lab Hrs/		External		Internal			
			T	P	T	CE	P		
3	-	-	3	60	-	20	20	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>Unit-I:</b> Energy Bands in Solids, Electrical conductivity, Carrier Concentration and Fermi level of intrinsic Semiconductor, Donor and Acceptor, Carrier density and Fermi level in extrinsic semiconductor (Qualitative Idea). Dependence of Fermi level on donor and acceptor concentration, Idea of carrier mobility, Drift and Diffusion current, Einstein relation.	%	13
2	<b>Unit-II:</b> P-N junction: barrier formation, barrier potential, transition capacitance, qualitative mechanisms of junction breakdown: avalanche breakdown and zener breakdown, Zener diode.	%	8
3	<b>Unit-III:</b> Idea of biasing, biasing of P-N junction, current across P-N junction, diode equation, diode resistances, load line of diode circuit.	%	9
4	<b>Unit-IV:</b> Half wave and Full wave rectifier, bridge rectifiers, ripple factor, rectification efficiency, clipping and clamping circuits, basic working idea of solar cell, LED, Logic Gates and Boolean algebra: Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. AND, OR and NOT Gates (Realization using Diodes and Transistor). NAND AND NOR Gates. Exclusive OR and Exclusive NOR Gates. Boolean algebra :- De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Minterms and Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2)Karnaugh Map.	%	15

\*Continuous Evaluation:



It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**

1. Electronic Principles  
A. P. Malvino; Tata McGraw Hill Publication New Delhi
2. Basic Electronics  
Grob Bernard
3. Basic Electronics  
Thareja B.L.
4. Principles of  
Electronics Mehta V.K.
5. Fundamentals of  
Microelectronics Behzad Razavi

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Physics

SYLLABUS FOR 3rd Sem PROGRAMME

Electricity and Magnetism (11104202)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme				Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/	Lab Hrs/	Credit	External		Internal			
				T	P	T	CE	P	
3	-	-	3	60	-	20	20	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>Unit-I:</b> Current and circuits: Charge density, Current density and equation of continuity, conductivity, relaxation time, Kirchoff's Laws and their applications, Rise and decay of currents in LR, RC and LC circuits, LCR series circuit (Acceptor Circuit), resonance, bandwidth Quality Factor, Parallel Circuit (Rejector Circuit), Electromagnetic induction, emf, faraday's law lenz's law, self and mutual inductance, Power in AC circuit, Choke Coil, Maxwell's bridge, Wein's bridge	%	15
2	<b>Unit-II:</b> Electrostatics: Concept of irrotational & rotational vector fields, gradient of scalar field and curl of a vector field, Gauss's Law with applications, Poisson's equation, Laplace's equation and Uniqueness theorems, Properties of conductor in electric field, E and D fields, Electric dipole, dipole moment, polarization and charge density, polarizability and susceptibility, field of a dipole, Electric displacement, Gauss's law in dielectrics, bound charges and their physical interpretation, Static boundary conditions in dielectrics, electric potential, Energy of field in the presence of dielectrics, potential and field due to charged shell, ring, disc	%	15
3	<b>Unit-III:</b> Magnetism: Magnetic field and units, Lorentz force, Biot-savart's law, Ampere's law with applications, torque on a current loop in magnetic field, magnetic dipoles in atoms and molecules, diamagnets, paramagnets, ferromagnets, gyromagnetic ratio, Bohr magneton, hysteresis, hysteresis loss, permeability, susceptibility, retentivity, coercivity, Boundary conditions for B and H, magnetic potential, energy in magnetic fields, Susceptibility measurement	%	15

**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**

1. Electricity and magnetism  
Berkley physics course, Vol. II; Mcgraw books company
2. Introduction to Electrodynamics  
David J. Griffiths Prentice
3. Classical Electrodynamics  
J D Jackson, John Wiley & Sons, New York
4. Electricity and magnetism  
D Chattopadhyay and P C Rakshit
5. Electricity and Magenetism with  
Electronics K. K. Tiwari
6. Electricity and Magnetism  
By D C Tayal; (Himalaya Publishing House,1988)
7. Elements of Electromagnetics  
Sadiku M. N. O

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Physics

SYLLABUS FOR 3rd Sem PROGRAMME

Lab-1 (Electronics) (11104203)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme				Examination Scheme						Total
Lect Hrs/	Tut Hrs/	Lab Hrs/	Credit	External			Internal			
				T	P	T	CE	P		
-	-	2	2	-	30	-	-	20	50	

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	HALF- WAVE RECTIFIER:	%	3
2	FULL -WAVE RECTIFIER:	%	3
3	SERIES RESONANCE:	%	3
4	PARALLEL RESONANCE:	%	3
5	CE TRANSISTOR [PNP]:	%	3
6	LOGIC GATES:	%	3
7	CE TRANSISTOR [NPN]:	%	3
8	NORTAN:	%	3
9	KIRCHHOFF'S:	%	3
10	THEVENIN'S:	%	3

\*Continuous Evaluation:

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Physics

SYLLABUS FOR 3rd Sem PROGRAMME

Lab-2 (Electricity and Magnetism) (11104204)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/	Tut Hrs/	Lab Hrs/		External		T	Interna I	P	
			T	P	CE				
-	-	-	-	-	30	-	-	20	50

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	LEE $\eta$ S METHOD:	%	3
2	FLY WHEEL:	%	3
3	NEWTON $\eta$ S RING:	%	3
4	MAGNETIC FIELD ALONG AXIS:	%	3
5	YOUNG $\eta$ S MODULUS:	%	3
6	SONOMETER:	%	3
7	L-C-R-SERIES:	%	3
8	L-C-R-PARALLEL:	%	3
9	N.L.COOLING:	%	3
10	THERMOCOUPLE:	%	3

\*Continuous Evaluation:

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Chemistry

SYLLABUS FOR 3rd Sem B.Sc., IMSC PROGRAMME

Basics in Medicinal Chemistry (11105205)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme						Total
Lect Hrs/ Week	Tut Hrs/	Lab Hrs/		External			Internal			
			T	P		T	CE	P		
3	-	-	3	60	-		20	20	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>Unit-I: Antimalarial Drugs:</b> Basics of Malaria. Malaria cycle, classification of antimalarials, quinine, chloroquine, primaquine & pamaquine.	25%	10
2	<b>Unit-II Cardiovascular drugs:</b> Basics, Natural glycosides, digitalis, vasodilators, Hypertension, Main diseases of Cardio vascular system, AnginaPectoris,CHF etc.	25%	10
3	<b>Unit-III Antibiotics:</b> Definition, Introduction to penicillins, e.g. of Five Antibiotics penicillin-G, amoxicillin, ampicillin, <i>Cephalosporin C</i> & <i>Streptomycin</i> .	25%	10
4	<b>Unit-IV Neuroactive agents:</b> <b>Sedatives and hypnotics:</b> Basics & Barbiturates and non-barbiturates <b>Anticonvulsants:</b> Basics & Barbiturates, hydantoins <b>Antianxiety agents:</b> Basics & Benzodiazepines, diazepam. <b>Antipsychotic agents:</b> Basics & phenothiazines, butyrophenones and haloperidole <b>CNS Stimulants:</b> Basics & caffeine, theophylline etc.	25%	15

**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**

- Berger's Medicinal chemistry (Vol. 1-8) J Abraham, Wiley; VII Edition

2. Medicinal Chemistry  
AshutoshKar; New Age International Publishers
3. Synthetic Drugs  
G. R. Chatwal
4. Instant Notes: Medicinal Chemistry  
G. L Patrick; Viva Books
5. Medicinal Chemistry: An Introduction  
G Thomas; John Wiley
6. Medicinal Chemistry Principles and  
Practice F.D. King; RSC, 1994

# PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of CDC

SYLLABUS FOR 3rd Sem B.Sc., IMSC PROGRAMME

Personality Development and Communication Skills - I (11193201)

**Type of Course:** B.Sc., IMSC

**Prerequisite:** Knowledge of English Language studied till semester II.

**Rationale:** Enhancing Personality through communication skills is essential for students.

**Teaching and Examination Scheme:**

Teaching Scheme				Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/ Week	Lab Hrs/ Week	Credit	External		Internal			
				T	P	T	CE	P	
2	0	0	2	60	-	20	20	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

**Contents:**

Sr.	Topic	Weightage	Teaching Hrs.
1	<b>Grammar and Vocabulary:</b> Modal verbs, Idioms; Words that explore in depth all degrees and kinds of talk and silence; Terms for describing a disciplinarian, toady, dabbler, provocative woman, flag-waver, possessor of a one-track mind, free-thinker, sufferer from imaginary ailments, etc.; Terms for describing friendliness, energy, honesty, mental keenness, bravery, charm, sophistication, etc.	40%	6
2	<b>Objective General English::</b> Synonyms, Antonyms, One word substitution, Error Detection, Error Correction, Reading Comprehension (Small Passage)	25%	10
3	<b>Speaking and Writing Skills:</b> Speaking on the topics related to Current Affairs, Movie Review Writing, Essay writing (Expository, Descriptive, Narrative), Advertisement Writing	20%	8
4	<b>Soft Skills:</b> Time Management, interpersonal and intrapersonal skills, Building Relationships Through Interpersonal Communication	15%	6

**\*Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**

- , Technical Communication : Principles And Practice (TextBook)  
Sangeetha Sharma, Meenakshi Raman; Oxford University Press
- Word Power Made Easy  
Norman Lewis; Goyal Publishers, Delhi



3. English Grammar and Composition,  
Wren and Martin; S. Chand Publishers, New Delhi
4. Objective General English  
R.S. Aggarwal; S. Chand Publishers, New Delhi
5. Basics of Academic English, Book 1  
Deeptha Achar, et al; Orient Black Swan, Hyderabad
6. Barron's The Leader in Test Preparation  
Dr. Lin Lougheed,; New Age International (P) Limited Publishers, New Delhi
7. Developing Reading Skills: A Practical Guide to Reading Comprehension  
Exercises Françoise Grellet; Cambridge University Press, Cambridge

**Course Outcome:**

After Learning the course the students shall be able to:

Students will be able to

1. Understand importance of soft skills in professional life
2. comprehend objective general English
3. Respond to familiar issues / topics in English