PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Chemistry

SYLLABUS FOR 1st Sem B.Sc., IMSC PROGRAMME

Chemistry-I (11105101)

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	**Unit I**: **Unit-1: Alkanes,Alkenes and Alkynes**: Alkanes: Introduction, Preparation of alkanes: Hydrogenation of alkenes and alkynes, Reduction of alkyl halides (Metal and mineral acids, Grignard reagent)Corey House synthesis. Reactions: Combustion and Halogenation, Free radical mechanism (orientation, reactivity, transition state and reaction intermediates,stability and relative energy of free radicals). Alkenes: Introduction, Geometric isomerism and Nomenclature, Preparation of alkenes from halides, Dehydration of alcohols and Dehalogenation of vicinal dihalides, Saytzeff□s rule. Electrophilic addition reactions and Orientation: Mechanism of addition of H2, X2, HX, H2SO4, H2O and X2/H2O, Addition of alkene, Oxymercuration-demercuration, Hydroboration, Hydroxylation(syn. And anti), Structure, Reactivity and Stability of Allyl and Vinyl radicals,Ozonolysis and its use in structure determination. Alkynes: Introduction, Acidity of alkynes and formation of acetylides with Na,Ag, Cu and Grignard reagents. Preparation and reaction of alkynes with H2, X2,HX and H2O	33%	15

2	**Unit II**: **Electronic configuration and Periodic properties of s block elements**: Atomic size, Ionization energy, Electron affinity, Electronegativity, Trends in the metallic character. Ionization of elements and stabilization of various oxidation states. Determination of quantum numbers. Aufbau□s principle,Hund□s rule and Pauli□s Exclusion principle. Chemistry of s Block elements: Alkali Metals: Li, Na, K, Rb and Cs occurrence,Comparative study of elements, oxides, halides, hydroxides and carbonates.Exceptional property of Lithium. Alkaline Earth Metals: Be, Mg, Ca, Sr and Ba- occurrence, and comparative study of the elements,oxides,hydroxides,halides, sulphates and carbonates. Exceptional property of Beryllium. Flame colours imparted by s-block elements	33%	15
3	**Unit III**: **Chemical Bonding**: Introduction to types of bonds- Ionic bonds, covalent bond, co-ordinate bond and hydrogen bond. Ionic compounds: Lattice energy and factors affecting it, Madelung constants, Born-Haber cycle. Covalent bonding: Valence Shell Electron Pair Repulsion (VSEPR) theory and shapes of simple covalent molecules like H2O, NH3, CH4 , PCl5 , SF6 , IF7. Valence Bond Theory (VBT): assumptions, Hybridization involving s, p and d orbitals (sp, sp2, sp3, sp3d, sp3d2and sp3d) and shapes of simple molecules like CH4 ,C2H6, C2H2, PCl5, SF6 and IF7. Molecular Orbital Theory(MOT),Formation of bonding and antibonding molecular orbitals and bond order. Graphical representation of orbital energies (MO diagram).Bonding in homo and diatomic molecules/ions like N2, F2, O2, O2-, O2+ with MO diagrams,relation between bond order and bond lengths, magnetic properties.Bonding in hetero-diatomic molecules/ionslike CO, NO, NO+ and HX.	33%	15

***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. Principles of Inorganic Chemistry
   B. R. Puri, L. R. Sharma ; K. C. Kalia; S Chand and Company

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Physics

SYLLABUS FOR 1st Sem B.Sc., IMSC PROGRAMME

Physics-I (11104101)

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	**Unit-1**: Physical Interpretation of Vectors Triple product of vectors, scalar and vector fields,Curl, divergence and Gradient, Differentiation of vectors, line, surface and volume integration, applications of vectors to linear and rotational quantities, Introduction of Cartesian Coordinate System, Spherical Coordinate System, Cylindrical Coordinate System. Physical Interpretation of Vectors Triple product of vectors, scalar and vector fields,Curl, divergence and Gradient, Differentiation of vectors, line, surface and volume integration, applications of vectors to linear and rotational quantities, Introduction of Cartesian Coordinate System, Spherical Coordinate System, Cylindrical Coordinate System.	25%	11
2	**Unit-2**: Work, Energy and Momentum Concept of inertial and Non-inertial frames of references, Work-Energy principle, conservative forces, conservative force as the negative gradient of potential energy, Law of conservation of total energy and momentum. Centre of mass, variable mass, the rocket, conservation of angular momentum.	25%	11
3	**Unit-3**: **Properties of Matter** Introduction of stress and strain, Hooke's law (definition), Young's Modulus, Bulk Modulus, Modulus of Rigidity, Inter relations between elastic constants, Bending of beam, cantilever, Viscosity, Stoke's law, Poiseuille's formula, Equation of continuity, Bernoulli's theorem, surface tension, Poisson's Ratio, Equivalence of Shear to Compression & Extension, Relation between Y, K, ,Determination of Young's Modulus by Searle's Method.	25%	11

4	**Unit-4**: **Oscillatians and Waves** Characteristics of S.H.M., S.H.M. in mechanical, Non-linear (anharmonic) oscillator, Damped harmonic oscillator, Quality factor, oscillations of a system with two degrees of freedom, Introduction to Wave, General Equation of Wave Motion, Plane Progressive Harmonic Wave, Energy Density for a Plane Progressive Wave, Intensity of a Wave, Transverse Waves in Stretched Strings, Modes of Transverse Vibrations of Strings, Wave Velocity and Group Velocity.	25%	11

***Continuous Evaluation:**

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

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Mathematics

SYLLABUS FOR 1st Sem B.Sc., IMSC PROGRAMME

Mathematics-I (11106101)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/ Week	Lab Hrs/		External		Internal			
				T	P	T	CE	P	
3	2	-	5	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	**Unit-1**: Basic concept of Functions, Exponent function ##, log—functions, Theorems on Exponent, Log functions & Hyperbolic function, Derivative of a function, Differentiation rules, Rate of change, Derivatives of trigonometric functions, Chain Rule, Implicit differentiation rational exponents, Inverse functions and their derivative	19%	9
2	**Unit-2**: Application of Derivatives: Increasing decreasing functions, Maxima Minima, Error –approximation, Newton method, mean value theorems, Taylor theorem, and Maclaurin's theorem.	19%	9
3	**Unit-3**: Successive Differentiation, Leibnitz Rule, Examples	12%	6
4	**Unit-4**: Asymptotes, test of concavity& convexity, point of inflexion, Multiple point Training curves in Cartesian& Polar co-ordinates.	18%	8
5	**Unit-5**: Function of Two & Several Variables, Domain of functions, Limit, continuity and differentiation of function of two variables, Partial Differentiation, Chain rule, Euler's Theorem.	12%	6

6	**Unit-6**: Application of Partial Derivatives; Jacobian, Tangent plane and Normal line, Maximum and Minimum Values, Lagrange's Multiplier, Taylor's and Maclaurin's Series for functions of two variables.	20%	10

***Continuous Evaluation:**

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

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Applied Science & Humanities

SYLLABUS FOR 1st Sem B.Sc., IMSC PROGRAMME

Environmental Science (11100101)

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	**Unit 1**: **Fundamentals of environmental science** Definition, Principle and scope of environmental science Composition and structure of atmosphere	13%	5
2	**Unit 2**: **Natural resources** Water**,** Land**,** Minerals and Forests	12%	5
3	**Unit 3**: **Environmental pollution** Water pollution, Air pollution, Land pollution Sources, effects & control of pollution.	25%	10
4	**Unit 4**: **Energy resources** Solar energy, Nuclear energy, Wind energy, Hydro energy, Wave energy.	25%	10
5	**Unit 5**: **Radiation pollution** Sources, Effects, Control.	13%	5

6	**Unit 6**: **Thermal and noise pollution** Sources, Effects, Control of thermal and noise pollution.	12%	5

***Continuous Evaluation:**

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

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Applied Science & Humanities

SYLLABUS FOR 1st Sem PROGRAMME

Foundations of Biology-I (11100105)

Type of Course:

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/ Week	Lab Hrs/		External		Internal			
				T	P	T	CE	P	
3	2	-	5	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	**Unit-1**: **<u>Origin and Evolution of Life</u>** Theory of special creation, theory of abiogenesis, theory of biogenesis, cosmozoic theory of origin of life, Oparin and Haldane's theory, evolution of eukaryotic cell, Evidences of Organic evolution (evidence from morphology, embryology, paleontology), Mechanism of Evolution (Darwin's theory vs Lamarck's theory), Taxonomy of organisms - Five kingdom classification and nomenclature.	22%	10
2	**Unit-2**: **<u>Cells and Cell structures</u>** Broad classification of cell types, discovery of cell and cell theory, comparison between plant and animal cells. Cell organelles, Cell wall, Plasma membrane, Cytoskeleton, protoplasm, Mitochondria, Chloroplast, ER, Golgi complex, Lysosome, Endosome and microbodies, Ribosome, Centriole, Nucleus.	33%	10

3	**Unit-3**: **Basics of Plant Sciences** ‡ Types of Plant cells and Tissues, Morphology and modifications; Tissues; Anatomy and functions of different parts of flowering plants: Root, stem, leaf, inflorescence- cymose and racemose, flower, fruit and seed. Salient features and classification of plants into major groups-Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms.	23%	13
4	**Unit-4**: **Basics of Animal Sciences** ‡ Types of Animal cells and tissues: Morphology and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). Salient features and classification of animals-nonchordate upto phyla level and chordate upto classes level.	22%	12

***Continuous Evaluation:**

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

List of Tutorial:

1. Preparation of media and other reagents
2. Isolation of bacteria
3. Study of various shoot modifications
4. Study of various root modifications
5. Study of different types of inflorescence
6. Study of animal systems such as Digestive, Circulatory, Respiratory, Reproductive and Nervous through chart/ images
7. Study of structure of DNA
8. Study of structure of different forms of RNA
9. Study of DNA replication through chart/ images
10. Study of chromosome and giant chromosomes using chart/ images

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Microbiology

SYLLABUS FOR 1st Sem B.Sc., IMSC PROGRAMME

Basics of Computer Application (11100103)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/ Week	Tut Hrs/ Week	Lab Hrs/ Week		External		Internal			
				T	P	T	CE	P	
2	-	-	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	**Unit-1**: **Basic concept of computer:** Introduction, different components of computer, basic design of computer	33%	10
2	**Unit-2**: **Introduction to Microsoft Office:** **Windows operation:** Customizing the interface, windows explorer, computer upkeep & utilities **Office operation** Microsoft word: concept of toolbar, character, paragraph& document formatting, drawing tool bar, header footer, document editing, page setup, short cut keys, text & graphics. Microsoft excel: concept of spread sheets, creating worksheet, well formatted documents, concept of row, column, cell & formula bar, using function, using shortcuts, chart, conditional formatting, goal seek, validation rule. Microsoft powerpoint: slide presentation, slide layout & design, custom animation, image importing, slide transition	67%	20

***Continuous Evaluation:**

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

Reference Books:

1. Working with personal computer software
R.P. Soni, H. A. Arolkar and Sonal Jain

2. PC software for Windows 98 made simple
R. K. Taxali
3. Fundamentals of Computers by
Rajaraman

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of CDC

SYLLABUS FOR 1st Sem B.Sc., IMSC PROGRAMME

Communication Skills-I (11193101)

Type of Course: B.Sc., IMSC

Prerequisite: Knowledge of English Language studied till 12th standard.

Rationale: Basic Communication Skills are essential for all Science graduates.

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
				External		Internal			
Lect Hrs/ Week	Tut Hrs/ Week	Lab Hrs/ Week		T	P	T	CE	P	
2	-	-	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	**Grammar**: Practice & Application	13%	4
2	**Listening Skills**: Telephonic Conversation	6%	2
3	**Speaking Skills**: Storytelling, Role Play, Presentation, ITEP (International Test of English Proficiency) – Speaking Task 1: To speak on a given topic for 1 minute, IELTS (International English Language Testing System) Task 1**:** To speak on a given topic for 2 to 3 minutes	41%	12
4	**Reading**: Reading Comprehension	6%	2
5	**Writing Skills**: Selection of topic, thesis statement, developing the thesis; introductory, developmental, transitional and concluding paragraphs, linguistic unity, coherence and cohesion, descriptive, narrative, expository and argumentative writing, Dialogue writing, Paragraph writing, ITEP – Writing Task 1: write a short note to respond to a simple situation or topic (75 to 100 words), E- mail, memorandum, notices, agenda.	34%	10

***Continuous Evaluation:**

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

Reference Books:

1. Technical Communication : Principles And Practice 2008
   Sangeetha Sharma, Meenakshi Raman; Oxford University Press, New Delhi (Green Cover Page)
2. English for Academic Purposes-I
   Deeptha Achar, et al,; OBS
3. The Leader in Test Preparation 2011
   Dr. Lin Lougheed, Barron's; New Age International (P) Limited Publishers
4. UTS Insearch English Prepare for IELTS: Academic module 2012
   University of Technology Sydney
5. Developing Reading Skills: A Practical Guide to Reading Comprehension Exercises 1981
   Frangoise Grellet; Cambridge University Press
6. Communication Skills for Technical Students
   T.M. Farhathullah; OBS

Course Outcome:

After Learning the course the students shall be able to:

Students will be able to:
1) Comprehend day to day English
2) Respond to familiar issues / topics in English

List of Practical:

1. Reading Comprehension
2. Grammar Practice & Applications
3. Listening
4. Story Telling & Role Play
5. Dialogue Writing & Test
6. Practical Presentations
7. Speaking Task 1 & 2
9. Thesis Writing
10. Topic,Statement & Development of Thesis
11. Paragraph Development
12. Short Notes
13. Email Writing
14. Writing Memo
15. Notices and Agenda

List of Tutorial:

10. Presentations: Pre-task

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Chemistry

SYLLABUS FOR 1st Sem B.Sc., IMSC PROGRAMME

Lab-I (Chemistry-I) (11105102)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/	Tut Hrs/	Lab Hrs/ Week		External		Internal			
				T	P	T	CE	P	
-	-	3	2	-	30	-	20	-	50

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

List of Practical:

1. To determine normality and strength of given oxalic acid and sulphuric acid mixture using volumetric titrations.
2. To determine normality and strength of given oxalic acid and potassium oxalate mixture using volumetric titrations.
3. To determine the normality and strength of sodium nitrite and potassium permanganate solutions using volumetric titrations.
4. Determination of elements, functional group analysis and identification of given organic compound: Acetanilide
5. Determination of elements, functional group analysis and identification of given organic compound: Benzoic acid
6. Determination of elements, functional group analysis and identification of given organic compound: beta-naphthol
7. Determination of elements, functional group analysis and identification of given organic compound: oxalic acid
8. Determination of elements, functional group analysis and identification of given organic compound: Urea
9. Determination of elements, functional group analysis and identification of given organic compound: Aniline
10. Determination of elements, functional group analysis and identification of given organic compound: Nitrobenzene
11. Determination of elements, functional group analysis and identification of given organic compound: Benzaldehyde
12. Determination of elements, functional group analysis and identification of given organic compound: chloroform
13. Determination of elements, functional group analysis and identification of given organic compound: Methyl alcohol
14. Determination of elements, functional group analysis and identification of given organic compound: Acetone
15. Determination of elements, functional group analysis and identification of given organic compound: Ethyl acetate

16. Determination of elements, functional group analysis and identification of given organic compound: Cinnamic acid

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Physics

SYLLABUS FOR 1st Sem B.Sc., IMSC PROGRAMME

Lab-II (Physics-I) (11104102)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
Lect Hrs/	Tut Hrs/	Lab Hrs/ Week		External		Internal			
				T	P	T	CE	P	
-	-	3	2	-	30	-	20	-	50

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

List of Practical:

1. Y.M. of Wire
2. M.I. of disc and rigidity of wire
3. Bar pendulum: determination of k and g
4. Bending of beam
5. y by cantilever
6. Verification of parallelogram theorem
7. Elastic constant by searl's method.
8. Determination of modulus of rigidity (dynamical, statical methods)
9.