PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Statistics

SYLLABUS FOR 2nd Sem B.Sc. PROGRAMME

Probability Theory – I (11110151)

Type of Course: B.Sc.

Prerequisite:

Rationale:

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	
4	-	-	4	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** Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical , statistical and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications.	25%	15 hrs
2	**UNIT 2** Random variables: discrete variables, p.m.f. , illustrations and properties of random variables	20%	15 hrs
3	**UNIT 3** Standard probability distributions: Binomial, Poisson, geometric, negative binomial, hyper geometric along with their properties and limiting /approximation cases.	30%	15 hrs
4	**UNIT 4** Expectation and moments of a random variable, Two dimensional random variables: discrete type, joint, marginal and conditional p.m.f., independence of variables	25%	15 hrs

Reference Books:

1. Hogg, R.V., Tanis, E.A. and Rao J.M. (2009): Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi.
2. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
3. Myer, P.L. (1970): Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Statistics

SYLLABUS FOR 2nd Sem B.Sc. PROGRAMME

Lab II (Statistics) (11110151)

Type of Course: B.Sc.

Prerequisite:

Rationale:

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	
-	-	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. Fitting of binomial distributions for n and p = q = ½.
2. Fitting of binomial distributions for given n and p.
3. Fitting of binomial distributions after computing mean and variance.
4. Fitting of Poisson distributions for given value of lambda.
5. Fitting of Poisson distributions after computing mean.
6. Fitting of negative binomial.
7. Fitting of suitable distribution.
8. Application problems based on binomial distribution.
9. Application problems based on Poisson distribution.
10. Application problems based on negative binomial distribution.

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Statistics

SYLLABUS FOR 2nd Sem B.Sc. PROGRAMME

Introduction to Microeconomics – I (15101151)

Type of Course: Economics

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

Rationale:

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	
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	**Introduction and Subject Matter:** Nature and scope of economics; Micro economics and macroeconomics; Positive economics and Normative economics; Concept of Equilibrium, Partial and general equilibrium; Methodology in economics; Concepts of static, comparative static and dynamics; Choice as an economic problem; Basic postulates	25%	11
2	**Consumer Behavior – Cardinal Utility:** Utility - Cardinal and ordinal approach; Law of diminishing marginal utility and Law of equi marginal utility; Consumer's equilibrium and demand curve explanation with Cardinal utility approach- Role of price mechanism; Demand and supply; Basic framework - applications; Market equilibrium; Illustration with an example and application	23%	10
3	**Consumer Behavior – Ordinal Utility :** Indifference curve; Consumers equilibrium (Hicks and Slutsky); Explanation of Consumer's equilibrium and Demand Curve by indifference curve; Inferior goods and Giffen goods; Compensated demand; Elasticity of demand- Price, Income and Cross and elasticity of substitution; method of measuring price elasticity of demand; Illustrative examples; Consumers' surplus and producer's surplus and the deadweight loss; Engel curve	27%	13

4	**Theory of Production and Costs :** Production decision; Production function; Iso-quant; Factor substitution; Law of variable proportions; Returns to Scale; Economies of scale; Different concepts of costs and their interrelation; Equilibrium of the firm; Expansion path; empirical evidence on costs.	25%	11

*__Continuous Evaluation:__ It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED READING:

1. Ahuja H.L(2006) , *Modern Microeconomics Theory and Application*, S. Chand, New Delhi .
2. Samuelson P.A. and W.D. Nordhaus (1998*), Economics*, Tata McGraw Hill, New Delhi
3. Varian H.R. (2000), *Intermediate Microeconomics*: A modern Approach (5th Edition), East West Press, New Delhi.

Course Outcome:

This course is designed to expose first-year students, who may be new to economics, the basic Principles of microeconomic theory. The emphasis will be on thinking like an Economist and the course will illustrate how microeconomic concepts can be applied to Functions of business

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Physics

SYLLABUS FOR 2nd Sem B.Sc., IMSC PROGRAMME

Physics-II (11104151)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

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	
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:** Kinetic Theory and Ideal Gases Postulates of kinetic theory of gases, velocity of gas molecules, Molecular energy, Kinetic-molecular model of an ideal-gas, kinetic interpretation of temperature, Degree of freedom of gas molecules, Maxwell's law of equipartition of energy.	25%	11
2	**Unit 2:** Laws of Thermodynamics Zeroth law of Thermodynamics , I st and II nd laws of Thermodynamics, concepts of Temperature, internal energy and entropy, calculations of change of internal energy, and Entropy in various thermodynamic processes.	25%	12
3	**Unit 3:** Thermodynamics potentials, helmoltz & gibbs functions,maxwell relations Giibs and Helmholtz energy, Gibbs paradox, Enthalpy, and Maxwell's thermodynamic relations	25%	11
4	**Unit 4:** Elements of statistical physics and thermodynamics of black		

	bodies Fermi Dirac, Maxwell Boltzmann, & Bose Einstein distributions ,Black body and characteristics, radiation principles like Rayleigh Jeans, Weins and Planck's law of black body radiation.	25%	11

***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 2nd Sem B.Sc., IMSC PROGRAMME

Lab-II (Physics-II) (11104152)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

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	
-	-	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. Oscillations of mass-spring system
2. Energetics of mass-spring system
3. Study of a compound pendulum (Kater's Bar).
4. Study of relaxation in a simple pendulum
5. Study of under damped harmonic oscillator
6. Computer simulation of lissajous figures
7. Computer simulation of projectile motion with and without resistive forces
8. Newton's law of cooling

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Chemistry

SYLLABUS FOR 2nd Sem B.Sc., IMSC PROGRAMME

Chemistry-II (11105151)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

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	
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:** **Atomic structure** Dual nature of radiation and matter, de Broglie's principle, Heisenberg's Uncertainty principle, Schrödinger wave equation and its interpretation, origin of quantum numbers and symbols for orbitals, shapes of orbitals - s, p, d. Radial and angular probabilities. p-Block elements: Comparative study of the elements of Groups 13-18 with special reference to electronic configuration, structure of elements and trends in atomic and ionic radii, ionization potential, electron affinity, electronegativity, metallic character and oxidation states. Inert pair effect. Structure, properties and applications of important compounds	33%	15
2	**Unit 2:** **Alkenes:** Introduction, geometric isomerism and nomenclature, preparation of alkenes, from halides, dehydration of alcohols and dehalogenation of vicinal dihalides, Saytzeff's rule. Electrophillic addition reactions and orientation; mechanism of addition of H_2, X_2, HX, H_2SO_4, H_2O and X_2/H_2O, addition of alkene,	33%	15

	oxymercurationdemercuration, 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 H_2, X_2, HX and H_2O. Resonance and tautomerism.		
3	**Unit 3: Solid State Chemistry** Solid state: Symmetry elements, unit cells, crystal systems. Laws of crystallography-Law of constancy of interfacial angles. Law of rational indices. Miller indices. X-Ray diffraction by crystals. Bragg's law. Structure of NaCl, KCl (qualitative treatment only). Defects in crystals. Colloidal State : Classification of colloids, Preparation and purification of sols, Stability of sols, Schulze-Hardy rule, Gold Number. Emulsions, gel and foam. Association colloids, Surfactants, Micelle formation and critical micelle concentration. Action of soap. Applications. Mesomorphic state: Difference between liquid crystal, liquid and solid. Classification and structure of nematic, smectic and cholesteric phases. Non-conventional liquid crystals. Applications	33%	15

***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 2nd Sem B.Sc., IMSC PROGRAMME

Lab-I (Chemistry-II) (11105152)

Type of Course: B.Sc., IMSC

Prerequisite:

Rationale:

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	
-	-	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 the normality and strength of given $FeSO_4$ and $K_2Cr_2O_7$ solutions when provided with 0.08N KMnO4 solution.

2. To determine the normality and strength of given Ferrous ammonium sulphate solution using internal and external indicators when provided with 0.07N $K_2Cr_2O_7$ solution.

3. To determine the normality and strength of given I_2 and $SnCl_2$ solutions when provided with 0.05N Na2S2O3 solution.

4. Inorganic qualitative Analysis: $CuCO_3$

5. Inorganic qualitative Analysis: KBr

6. Inorganic qualitative Analysis: $SrSO_4$

7. Inorganic qualitative Analysis: $CdCl_2$

8. Inorganic qualitative Analysis: $CoSO_4$

9. Inorganic qualitative Analysis: $FeSO_4$

10. Inorganic qualitative Analysis: $K_2Cr_2O_7$

11. Inorganic qualitative Analysis: K_2CrO_4

12. Inorganic qualitative Analysis: $BaCl_2$

13. Inorganic qualitative Analysis: $AlPO_4$

14. Inorganic qualitative Analysis: Na_3PO_4

15. Inorganic qualitative Analysis: NH_4SO_4

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Mathematics

SYLLABUS FOR 2nd Sem B.Sc.,PROGRAMME

Mathematics-II (11106151)

Type of Course: B.Sc.

Prerequisite:

Rationale:

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	
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:** Integrals-Indefinite integrals-Standard Forms - Initial Value Problems - Integration by substitution- Estimating with finite sums.	18%	8
2	**Unit 2:** Definite Integrals - Properties of Definite Integrals - Integral as the Limits of a Sum- Evaluation of Integrals- Area and the Mean Value Theorem-The Fundamental Theorem-Substitution in Definite Integrals. Integration by Parts (Theorem and Examples) -Integration of Rational Fractions - Irrational Fractions-Trigonometric Substitutions.	20%	8
3	**Unit 3:** Reduction Formulae for sinnx, cosnx, tannx, cotnx, secnx, cosecnx, cosmxcosnx, cosmxsinnx, sinmxsinnx, sinmxcosnx.	12%	6
4	**Unit 4:** Areas between curves- Finding volume by slicing- Volumes of Solids of Revolution - Disk and Washers- Cylindrical Shell- Lengths of Plane Curves- Areas of Surface of Revolution	16%	8
5	**Unit 5:** Matrix Algebra: Basic of Matrix & Operations on it		

	Introduction to matrices, different types of matrices, operations on matrices, Theorems on matrices, Elementary operations on matrices and types of matrices, Symmetric and skew-symmetric matrices, Hermitian and skew-Hermitian matrices. Linear dependence and independence of row and column matrices. Row rank, column rank and rank of a matrix. Row Reduced Echelon (RRE) form of a matrix and matrix inversion using it.	17%	8
6	**Unit 6 :** Matrix Algebra: Eigen Values & Eigen Vectors Eigen values, Eigen vectors and the characteristic equation of a matrix. Cayley-Hamilton (CH) theorem and its use in finding inverse of a matrix. Application of matrices in solving a system of simultaneous linear equations. Cramer's rule. Theorems on consistency of a system of simultaneous linear equations	12%	8

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

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of Computer Application

SYLLABUS FOR 2nd Sem B.Sc., IMSC PROGRAMME

Advanced Computer Applications and Architecture (11100152)

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	1	-	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:** **Introduction to computers:** Introduction to computers, history of computers, parts of computer. Computer terminology. Start-up of a computer. Disk drives, Disc utilities. Starting and stopping a computer. Use of mouse. Installing and uninstalling software. Maintenance of computer. Purchasing a computer. Types of computers	23%	10
2	**Unit 2:** **Hardware of computer:** Input and output devices. Central Processing unit (CPU), Keyboard, Monitor, Mouse, Printers, Modems, Scanners, Digital Cameras, Different cards (sound, colour and video), Different drives (floppy, hard disk, CD, DVD).	23%	10
3	**Unit 3:** **System software and Programming**: **System software:** Function, types and utilities **Computer Programming:** Languages-Machine and assembly languages, FORTRAN, COBOL, BASIC, C, C++, Java etc.	31%	15
4	**Unit 4:** **Applications of computer**		

	Desktop publishing, Spreadsheet, Database, Graphics, Presentation, Communication, Browser, Web pages, Email, Project management, Integrated and suits.	23%	10

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

PARUL UNIVERSITY - FACULTY OF APPLIED SCIENCE

Department of CDC

SYLLABUS FOR 2nd Sem B.Sc. PROGRAMME

Communication Skills-II (11193151)

Type of Course: B.Sc.

Prerequisite:

Rationale:

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	**Unit-1:** **Vocabulary and Grammar**: Adjectives, Degree of Comparison, Conjunctions, vocabulary on µHow to talk about science and scientists	27%	8
2	**Unit-2:** **Listening Skills:** Speeches by the leaders (Audio -Video)	6%	2
3	**Unit-3:** **Speaking Skills** Speaking: (a) To speak on a given topic for 2 minutes, Category: Comparison-contrast and Problem -solution, (b) Cue Card (like IELTS exam) - To speak on a given topic, using the prompts to guide you, for 3 minutes, Presentation Task, Group Discussion	27%	8
4	**Unit-4:** **Writing Skills** (a) single Picture Description, (b) Picture description - comparison, Note Making, Precise Writing, Writing task: Comparison-contrast and Problem-solution	27%	8

5	**Unit-5: Writing a Book Review** List of Books Suggested for the Book Review: The Secret by Rhonda Byrne, Wings of Fire by A P J Abdul Kalam, Who Moved My Cheese by Dr Spancer Johnson, You Can Win by Shiv Khera, Stay Hungry Stay Foolish by Rashmi Bansal, I am Ok You are Ok by Thomas Harris, The Seven Habits of Highly Effective People by Stephen Covey , The Eighth Habit by Stephen Covey, Bhagvat Gita on Effective Leadership by Poojan Roka, The Kalam Effect by Nair, Tough Times Never Last But Tough People Do by Dr. Robert Schuller, What Employers Want But Business Schools Don't Teach by Yasmin D'sousa and Amitabh Singh, Freedom is not Free by Shiv Khera, Be an Extraordinary Person in an Extraordinary World by Robert Schuller, Making Miracles by Arnold Fox and Barry Fox , The Road Less Travelled by M. Scott Peck to Name a few., I have a Dream by Rashmi Bansal, Connect the Dots by Rashmi Bansal, The saint, The Surfer and the CEO by Robin Sharma, Attitude is Everything by Jeff Keller **NOTE: These are few references of books. Students can prepare book review on a book of their choice after consulting tutorial faculty**	13%	4

***Continuous Evaluation:**

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

Reference Books:

1. English for Academic Purposes- Deeptha Achar

2. Technical Communication : Principles And Practice Sangeetha Sharma, Meenakshi Raman

3. Barron's The Leader in Test Preparation Dr. Lin Lougheed

4. UTS In search English Prepare for IELTS Academic module 2012, University of Technology, Sydney

5. Developing Reading Skills: A Practical Guide to Reading Comprehension Exercises Frangoise Grellet

6. How to write better essays Palgrave-Macmillan: Basingstoke Greetham

7. Communication Skills Parul Popat and Kaushal Kotadia

8. Teaching Beginning Reading and Writing with the Picture World Inductive Model Emily F. Calhoun