Prof. V.D.Kulkarni,
Dept of Physics
HutatmaRajguruMahavidyalaya,
Rajgurunagar (Pune)

Teaching Plan (Sem-I)

(2017-18)

T.Y.B.Sc. PH 333 Classical Mechanics

Sr. No.	Topics	Dates
01	**1. Mechanics of system of particles** Introduction –Newton's laws	**01/07/2017 To 15/07/2017**
02	Applications of Newton's laws of motionProjectile motion in various medium,	
03	Rocket motion,	
04	Motion of a charged particle in constant electric, magnetic and electromagnetic field.	
05	General features of motion, equation of orbit, Deduction of Kepler's laws of planetary motion, Orbits of artificial satellite, Problems.	
06	System of particles, Centre of mass, Conservation of linear momentum, angular momentum,	
07	Energy of system of particles (statements only) Problems	
18	**4. Langrangian and Hamiltonian formulation** 1 Limitations of Newtonian formulation	16/07/2017 To 30/07/2017
19	Types of constraints, degrees of freedom, generalized coordinates, configuration space	
20	D' Alembert's principle of virtual work	
21	Langrangian equation from D' Alembert's principle, cyclic coordinates,problems	
22	Phase space, Hamiltonian's equations State of Systems, Ensembles	

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Teaching Plan (Sem-I)

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T.Y.B.Sc. PH335: Computational Physics

Sr. No.	Topics	Month
01	**1.Concepts of programming:** Definition and Properties of algorithms, Algorithm development,	1/08/2017 To 08/08/2017
02	Algorithm development, Flow charts- symbols and simple flowcharts	
03	Flow charts and Algorithms for Kinematic equations, Free fall, Equation of state, Factorial of a number.	
04	Types of programming language: Lower, middle and higher level languages.	
05	**1. C Programming** Structure of C program, Character set, key words,	09/08/2017 To 25/08/2017
06	Constants andvariables, Variable names,	
07	Data types and their declarations, Symbolic Constants.	
08	Input/output functions: scanf ( ), printf ( ), getchar ( ), putchar ( ), getch ( ), gets ( ), puts ( ).	
09	Operators and Expressions: Arithmetic Operators, Relational Operators, LogicalOperators,	
10	Assignment Operators, Conditional Operator. Formatted input/output	
11	Control statements: If, if else, while, do while for loop, nested control structures	
12	(nested if, nested loops), break, continue, switch- case statement, goto statement.	
13	Use of Library functions: e.g. mathematical, trigonometric, graphics.	
14	**3. Arrays and Pointers in C** Arrays: 1-D, 2-D and String	

		25/08/2017 To 30/08/2017
15	Examples: Arranging numbers in descending and ascending order,	
16	Sum of matrices, multiplication of matrices.	
17	Concept of Pointers	
18	**4. User Defined Function in C** User defined functions: Definitions and declaration of function, function prototype.	1/09/2017 To 7/09/2017
19	Passing arguments (Call by value, Call by reference).	
20	Storage Classes: Auto, External, Static, Register variables.	
21	**5. Graphics in C**: Some simple graphic commands	8/09/2017 To 15/09/2017
	- Line, Circle, Arc, Ellipse, Bar.,Problems	
22	**6. Computational Physics:** Errors in Computation: Inherent errors in storing numbers due to finite bit representation to use inComputer, Truncation error, round off errors	16/09/2017 to till term end (05/10/2017)
23	Iterative methods: Discussion of algorithm and flowcharts and writing Cprograms for finding	
24	single root of equation using bi-section method, NewtonRaphsonmethod.	
25	Discussion of algorithm and flowcharts and writing C program for trapezoidalrule and Simpson's 1/3rd rule	

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T.Y.B.Sc. (Sem-II)

Thermodynamics and Statistical Physics (PH-343)

Sr. No.	Topics	Dates
01	**Ch-1 - Kinetic Theory of gases** Assumptions of Kinetic Theory of gases, Mean free path	23/11/2017 To 12/12/17
02	Transport Phenomena, Viscosity	
03	Thermal conductivity and diffusion	
04	Problems	
05	**Ch-2- Maxwell's relations and applications** Thermodynamic functions	13/12/17 To 5/1/18
06	Enthalpy, Entropy, Internal Energy, Helmholtz Functions	
07	Maxwell's relations	
08	First and Second TdS equations	
09	Joule – Thomson's effect, Problems	
10	**Ch-3- Elementary Concepts of Statistics** Probability distributions, functions	10/1/18 To 24/1/18
11	Random Walk Problem and Bionomial distribution	
12	Simple Random Problem	
13	Probability distribution for large N	
14	Gaussian Probability distribution and Problems	
15	**Ch-4- Statistical distribution of system of particles** State of Systems, Ensembles	25/1/18

16	Basic Postulates, Probability Calculations	To 24/2/18
17	Behavior of density of states	
18	Thermal. Mechanical Interactions, Problems	
Sr. No.	**Topics**	**Dates**
19	**Ch-5- Statistical Ensembles** Micro canonical Ensembles, Canonical Ensembles	26/2/18 To 7/3/18
20	Applications of Canonical Ensembles	
21	Molecules in ideal gas, Mean Values in Canonical Ensembles, Problems	
22	**Ch-6-Quantum States** Quantum distribution function	8/3/18 To 13/3/18
23	Maxwell – Boltzman Statistics, Bose – Einstein Statistics	
24	Fermi – Dirac Statistics, Comparisions,Problems	

1) T.Y.B.Sc.:- Sixteen (16) Practical of **Three** batches will be complete in Academic Year 2017-2018.

2) Projects of T.Y.B.Sc Students.:- Projects of Five (5) Students of T.Y.B.Sc. will be complete in Academic Year 2017-2018.

Dr. V.D.Kulkarni