

Sir P. T. Sarvajani College of Science, Surat

Proposes

Foundation Course in Physics

Duration of the Course: 12th June to 17th June, 2023

Objective of the course:

It has been found from the experience over the years that the students entering the first year of the college have hardly been trained to solve problems independently, particularly in Physics. Even their theoretical background also needs to be polished and at times, they have many misconceptions which need to be rectified.

Also, there are some students who aim to build their career in the subject of Physics and for that matter in the field of research. They need to be trained in a particular way which is otherwise not possible during their regular schedule.

It is a well-known fact that one can really understand the basic concepts only when one applies one's knowledge to solve numerical/theoretical problems. For solving problems of Physics, one needs to have sound knowledge of Mathematics too. This certificate course is designed to develop mathematical abilities and skills of students simultaneously along with their problem solving ability in Physics so that at the end of course, they are better equipped to apply their knowledge in understanding the subject and be self-reliant and confident in solving problems of Physics.

Further, it is also observed that the students from South Gujarat region are not keen to appear for National Level Entrance Examinations conducted by the premier institutes of our country such as IITs, TIFR, IISERs, NICERs etc. for their higher studies. One of the aims of this certificate course is to provide information to the students regarding such exams and motivate them to prepare for such entrance examinations and succeed in passing these examinations.

Here, it may be stressed that this Certificate Course is not a replacement of existing syllabi, nor it is intended to be. The purpose is to digress a bit from constrained syllabus of the university and to develop a broader perspective of the subject so that they can have a smoother transition from introductory to advance level Physics.

So the basic purpose of this course is to equip the students

- a) to understand the intricacies of mathematics
- b) to understand the interdependence of Physics and Mathematics
- c) to understand and appreciate Physics better
- d) to remove the fear of Mathematics and Physics from the students, if at all
- e) to appear in the competitive exams for admission to M. Sc. and other programs of the renowned institutes of the country

Pre-requisite of the Course:

Any student who has passed HSC examination with Physics as one of the subjects from any recognized Board is eligible to enrol in the proposed course. The student should have some basic knowledge of Physics.

Outcome of the Course:

The students will be more familiar with the basic ideas of geometry, functions, calculus and their applications in Physics. The students will be better equipped with the concepts of vectors, vector algebra, vector calculus and their applications in various fields of Physics. The students will also learn the fundamentals of heat and thermodynamics, learn about the state variables of thermodynamics, define entropy and study associated topics. With greater emphasize on problem solving, the students will be able to develop deeper insights which may help him/her in clearing competitive and entrance examinations.

Content of the Course:

After having thorough discussions with the experts, the content of the course plan has been finalized. There will be 2 modules; each of approximately 15 lectures of one hour each.

Module I *Basic mathematics:*

Geometry, Introductory Calculus, Functions of more than one variable etc; vectors, vector algebra and vector calculus.

Module II *Physics:*

Motion in one dimension and two dimensions, Newton's laws and their applications, revision of basic ideas of Mechanics, Rotational kinematics and dynamics, Heat, Zeroth law and temperature, Definition of state variables, forms of energy, the First Law, Heat engines and the Second law, Entropy and entropy change; Basic concepts of optics, Basic concepts of electromagnetism.

Course Type:

The teaching methodology for the modules will be as follows:

- Basic concepts of each topic will be discussed.
- More emphasis will be given to tutorials, problem solving and attempting MCQs.
- All the expected topics will be covered at an elementary level and stress will be given on concepts.
- The sessions are planned to be more of an interactive type rather than formal lectures.

Eligibility Criteria for the Course

Any undergraduate student studying in any semester in a college affiliated to VNSGU, Surat as well as those studying in SVNIT, Surat and who is aspirant for having a career in Physics

is eligible for registering this certificate course. The students of who have appeared in B. Sc. Sem. II and B. Sc. Sem. VI in April 2023 will be given preference.

Course Schedule:

The course is of 30 hrs duration. It will commence on 12th June and will be completed by 17th June, 2023. The daily routine will be of 5 hrs. The detailed time table will be provided on the first day of the course.

Course Venue: Department of Physics, Sir P. T. Sarvajanik College of Science, Surat

Course Fee: Rs. 1500/-

Total Number of Expected Participants: 30

Exam Pattern of the Course:

At the end of the course, an examination will be conducted. The question paper will include questions of the type of MCQ, descriptive and problem solving. The successful students will get certificate from the VNSGU, Surat and it will add 2 credits to your account.

Instruction to the Participants:

1. Participants have to fill in the registration form and submit it on or before 10th June, 2023. The link for the registration is:
<https://docs.google.com/forms/d/1itelbb3SYffdyOOrj0b3umgSKqbp6dJr7I34zDYSQt/edit>
2. The students of Sir P. T. Sarvajanik College of Science, Surat can pay the fee from their own log in ids. Those who are from other colleges/institutes can pay the fee at the college counter and get the receipt.
3. It is mandatory for all the participants to bring their college identity (ID) cards during the course.
4. All the participants will have to report at the college in time during the course.
5. Regular attendance and active participation are must for the participants.

Let us all get together and enjoy the fascinating world of physics!!

For any query, contact:

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