SARVAJANIK EDUCATION SOCIETY

P. T. SARVAJANIK COLLEGE OF SCIENCE

NAAC ACCREDITED 'A' (3.03 CGPA)

COLLEGE WITH POTENTIAL FOR EXCELLENCE

No. : **Date :**

Sir P. T. Sarvajanik College of Science, Surat

Proposes

Advanced Course in Physics

Duration of the Course: 15th May to 15th June, 2022

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 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 also. This certificate course is designed to develop mathematical ability/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 some premier institutes of our country like IIT's, TIFR, IISER's , NICER's 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.

Keeping in mind these factors, a "Foundation Course in Physics" was conducted for the aspirants and this course is going to be like a follow up program for them.

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Here, it may be stressed that this certificate course is not a replacement of existing syllabi nor is it 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 be able to translate Physics into Mathematics and vice versa
d) to understand and appreciate Physics better
e) to be more competent and more confident
f) to appear in the competitive exams for admission to M. Sc. and other programmes of the renowned institutes of the country

Pre-requisite of the Course:

The student who had registered in the "Foundation Course in Physics" and cleared it successfully will be eligible for this course.

Outcome of the Course:

The students will be able to solve ordinary differential equations and partial differential equations with greater authority. It is required in many areas of Physics that you get such differential equations and need to solve them under some specific or boundary conditions such as in the fields of Newtonian Mechanics, Classical Mechanics, Quantum Mechanics etc. The students will be introduced to the basic concepts of Modern Physics, which will be a part of their regular curriculum later on. They will learn introductory elements of Electronics, which will be helpful to them to prepare projects in future. 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* continued:
Ordinary differential equations (up to second order with constant coefficients), Partial Differential Equations, Curvilinear coordinates, Complex algebra
Module II *Physics*:
Blackbody radiation and classical physics, the nature of photons, the photoelectric effect, the Compton effect, conceptual consequences of light as particles, matter waves and their detection, conceptual consequences of particles as waves, the behaviour and structure of atoms, basic concepts of Electronics

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Course Type:

The teaching methodology for the modules will be as follows:

- Basic concepts of each topic will be taught and discussed.
- More emphasis will be given to tutorials, problem solving, including MCQs.
- All the expected topics will be covered at an elementary level and stress will be given on concepts.

Eligibility Criteria for the Course

The student who had registered in the "Foundation Course in Physics" and cleared it successfully will be eligible for this course.

Course Schedule:

The course is of 30 hrs duration. It will commence on 15th May, 2022 and will be completed by 15th June, 2022.

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 adds 2 credits to your account.

Instruction for Participants:

1. Participants have to fill in the registration form and submit it to the college office on or before 10th May, 2022.
2. It is mandatory for all the participants to bring their college identity (ID) cards.
3. Regular attendance and active participation is must for the participants.
4. All the participants will have to report at the college in time during the course.

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

For further details, contact:
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