NAAC Re-Accredited 'A' Grade
विद्या अमृत अश्नुते
ESTD. 1963
RJC
ISO 9001:2015
Best College
UNIVERSITY OF MUMBAI

Hindi Vidya Prachar Samiti's

RAMNIRANJAN JHUNJHUNWALA COLLEGE (AUTONOMOUS)

(Also known as R. J. College of Arts, Science & Commerce as per UGC Notification)

**Affiliated to UNIVERSITY OF MUMBAI II Recognized by UGC under 2f & 12B
NAAC Accredited 'A GRADE' with CGPA 3.50**

Knowledge is all Ambrosia

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A

CERTIFICATE COURSE IN

UNDERSTANDING

PHYSICS USING

COMPUTER SOFTWARES

🖥 www.rjcollege.edu.in

📧 rjcollege@rjcollege.edu.in

☎ +91 22 25151763

📍 Opposite Railway Station, Ghatkopar (W),
Mumbai 400 086, Maharashtra, INDIA.

ABOUT US

Hindi Vidya Prachar Samiti was incepted on the auspicious day of Shri Krishna Janmashtami, 15th August 1938. A brain child of a visionary Late Shri Nandkishore Singh Jairamji, samiti was established with the objectives of catering to the educational needs of the Hindi speaking community. Ramniranjan Jhunjhunwala College came into existence in 1963, enabling a larger section of the society to take advantage of the facilities provided for higher education.

From 1999-2000 the College has added a number of self-financing courses like B.M.S., B.B.I., B.Sc. in Computer Science, Information Technology, Biotechnology, M.Sc. in Computer Science, Biotechnology and Information Technology as well as add on courses, which further hone the special skills of the students.

The college has been reaccredited with 'A' Grade by NAAC in 2014 with a CGPA 3.50 and received the Best College Award (2007-2008) of the University of Mumbai. The College has been bestowed with IMC "Ramkrishna Bajaj Performance Excellence Trophy", 2010.

The Principal of the college was awarded "Best Teacher" by Government of Maharashtra in 2011.

Government of Maharashtra conferred the college with "JAAGAR JAANIVANCHA" (First in Mumbai Suburban- in 2013 and Second in Mumbai Suburban- in 2014) for safety of girls.

Course Code: RJPHYC01

Duration: 30 hours

Credits : 02

LEARNING OUTCOME

Students will learn to use various softwares for data fitting and visualization. They will also get hands-on experience in easy methods of carrying out numerical analysis using Excel and Scilab with applications to physical problems. Some software's for symbolic calculations will also be introduced. A software for tracking moving objects in a video will be demonstrated which will be useful in innovative physics experiments. Simulating electronic circuits on a computer and writing reports using LaTeX with easy typesetting of complicated equations will also be covered. Most of these software's can run on any Android mobile phone.

COURSE CONTENT

Module 1	**Graph plotting and data fitting using gnu plot:** drawing simple, surface, contour plots, fitting curves to data, setting labels, legends and saving the figures in different formats, making batch file, etc.
Module 2	**Data visualisation and simple numerical analysis using Excel:** Plotting different plots from the given data.
Module 3	**Perform simple numerical differentiation and integration:** To solve some problems in physics, generate a trajectory of a simple nonlinear mapping and study various bifurcations, so on.
Module 4	**Symbolic computation using Sage or WxMaxima:** learning to simplify algebraic, trigonometric expressions and solve equations involving them. Perform symbolic differentiation, integration, etc.
Module 5	**Introduction to Octave or Scilab:** learning graph plotting commands for data visualization, learn to use the ODE solver to solve differential equations governing some physical problems.
Module 6	**Applications of Octave or Scilab:** Examples can include, projectile motion with and without drift, simple harmonic motion to simple pendulum to double pendulum, nonlinear oscillator.
Module 7	**Writing reports and making presentations using LaTeX:** writing simple text, typesetting equations, including and aligning figures, making presentations using document class beamer, and so on.
Module 8	**Using Tracker software to extract kinematical data of moving objects (I):** recording and tracking motion to determine the position as a function of time and hence other derived quantities to determine or verify the laws governing the motion.
Module 9	**Using Tracker software to extract kinematical data of moving objects(II):** Some more applications
Module 10	**Electronic Circuit Basics with Tinker CAD**

MEDIUM OF INSTRUCTION

English

EVALUATION

Assignments & multiple choice test The students are required to write their feedback report in LaTex.

100 MARKS

PASSING 40

WHO SHOULD DO IT?

For Physics Undergraduate and PG students