



Hindi Vidya Prachar Samiti's

Ramniranjan Jhunjhunwala College

of Arts, Science & Commerce

(Autonomous College)

Affiliated to

UNIVERSITY OF MUMBAI

Syllabus Framework As Per LOCF

Program: B.Sc. PHYSICS

Program Code: RJSUPHY

Syllabus Framework as per LOCF

Table of Content

Sr No	Content	Pg No
1	Preamble	3
2	Programme Outcome	5
3	Programme Specific Outcome	6
4	Table of Mapping of Programme Specific Outcome	7
5	Teaching Learning Process	8
6	Assessment Method	9

THE PREAMBLE

Why Physics

Physics deals with the fundamental concepts of the phenomena occurring in day today life and nature. It gives us powerful tools to help us to express our creativity, to see the world in new ways and then to change it. It gives an insight into the fundamental way the world works. Physics helps you to understand the world around you, and satisfy your curiosity. Studying physics develops your critical thinking and problem-solving skills. Physicists are versatile, who can be torch bearers and can guide students to excel in a field having a wide range of future careers. It is a global enterprise and offers the opportunity to work in scientific fields all over the world. It also opens the opportunities in international research collaborations. Physics drives technology advancements, impacting society, the environment and the economy of the country.

Why Physics in RJ College

Physics department in R J College has highly qualified faculty members and support staffs and is committed towards the development of innovative and handy ways of teaching at graduate, post graduate and developing a core research group for carrying out cutting edge research in various research fields like Condensed Matter Physics, Solid State Physics, Electronics, Theoretical physics and Simulations. The department also offers Doctoral Programme in order to nurture young minds towards embracing various scientific challenges. Efforts are taken to pay individual attention to the students in their laboratory work and tutorial sessions. Project work and problem sessions are encouraged to develop innovative and analytical approaches to physics learning. The department provides a conducive and friendly environment that nurtures excellence and high standards of professionalism in teaching, learning and research. The department has a progressive approach in professional development of faculty members and it is achieved by sending them for training courses like refresher course, FDP etc. so as to maintain a high degree of efficiency and performance. The faculties have a research collaboration with prestigious institutes from the country. To update the students about the

various developments in the Physics related fields, many invited lectures, talks and field visits are organized by the department which increases the student's interest in the subject. Our PG students are sent to various renowned institutes like Institute of Chemical Technology (ICT), Society for Applied Microwave Electronics Engineering and Research (SAMEER), Indian Institute of Technology, Bombay, Tata Institute of Fundamental Research (TIFR), Bhabha Atomic Research Centre (BARC), Indian Institute of Geomagnetism (IIGM) for performing their project work as a part of their curriculum under the able guidance of the faculties and Scientists. The Physics department has a group of alumni spread all over the world holding high positions.

Our Curriculum Your Strength

The curriculum designed by the Physics department is a learner-centered covering aspect of Physics in broad scale. In semester I and II the students learn about the Classical Mechanics, Modern Physics, Thermodynamics, Electronics and Electrostatics at introductory level. In Semester III and IV, students learn about Vector Calculus, Analog Electronics, Applied Physics covering interdisciplinary topics, Optics, Quantum Mechanics etc. In semester V and VI, the students are taught Mathematical, Thermal and Statistical Physics, Solid State Physics, Atomic and Molecular Physics, Electrodynamics, Classical Mechanics, Nuclear Physics, Electronics and Relativity at moderate to high level. Besides the core Physics topics they are also given exposure to Electronics Instrumentation, Computer languages and simulations through Applied Component paper. Apart from classroom teaching, students develop the skill of experiential learning which is required in many industries. Analytical thinking skill and application of theoretical knowledge is well developed among the students during learning. Participative learning skill is developed by field visits, projects presentations, and the department's annual festival-Physitech. Summer course and value-added courses run by the department impart extra knowledge to the learners other than the curriculum.

Programme Outcome for B Sc Physics

Programme outcomes refers to the overall characteristics an individual is supposed to acquire on the completion of the three year degree program in Bachelor of Science. The attributes based on acquisition, accumulation and processing of knowledge of the particular subject are transferable beyond the discipline and useful in different domains of life.

On successful completion of this program students will be able to:

PO1: Analytical thinking: Develop analytical abilities towards real world problems.

PO2: Problem solving: Enrich knowledge through problem solving hands-on activities, study visits, projects etc.

PO3: Critical thinking: Critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO4: Communication Skills: Ability to express thoughts and ideas effectively in writing and orally, communicate with others using appropriate media; confidently share one's views and express herself/himself.

PO5: Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

PO6: Lifelong learning: Ability to acquire knowledge and skills, including "Learning how to learn", that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development

Program specific outcomes for B Sc Physics

PSO1: Students shall demonstrate proficiency in applying knowledge of Physics in understanding working principles of various physical systems and instruments.

PSO2: Students will demonstrate knowledge of Classical mechanics, Thermodynamics, Solid State Physics, Atomic and Molecular Physics, Nuclear Physics, Optics, Modern Physics, Applied Physics and will be able to apply this knowledge to analyze various physical phenomena.

PSO3: Students will demonstrate the problem solving skills in the core and allied subjects.

PSO4: Students will show that they have acquired experiential skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.

PSO5: Students will be capable of oral and written scientific communication and will prove that they can think critically and work independently on projects.

B Sc Physics Programme Specific Outcomes Descriptors

	F Y B Sc				S Y B Sc						T Y B Sc									
	Sem I		Sem II		Sem III			Sem IV			Sem V					Sem VI				
	PI	P II	P I	P II	P I	P II	P III	P I	P II	P III	P I	P II	P III	P IV	A C	P I	P II	P III	P IV	AC
Disciplinary knowledge	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Analytical thinking	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Problem solving skill	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Critical thinking	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Experiential learning	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Digital Literacy	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Communication skill	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Teaching Learning Methods

The teaching learning method has been designed with student centric focus. The main aim of the teaching pedagogy is to teach domain knowledge to the students. It further aims to develop critical thinking, logical analysis and comprehensive development of the students studying the subject. The teaching learning methods include:

- Classroom teaching: Explaining concepts, theories, methodologies related to the subject
- Blended learning: Use of zoom platform, explainer videos and documentaries
- Knowledge repository: Use of Google classroom and canvas LMS
- Presentations: online and offline based on the syllabus
- Field visits: to the discipline related institutions
- Digital learning: Training students with the digital tools and technologies

Assessment Method

1. Two Internals of 20 marks each. Duration 30 min for each.
2. One External (Semester End Examination) of 60 marks. Duration: 2 hours.
3. Minimum marks for passing the Semester End Examination is 40 %.
4. Students must appear for at least one of the two Internal Tests to be eligible for the Semester End Examination.
5. For any ATKT examinations, there shall be ODD-ODD/EVEN-EVEN pattern followed.
6. HOD's decision, in consultation with the Principal, shall remain final and abiding to all.

Evaluation and Assessment

Total marks per course - 100.

CIA- 40 marks

CIA 1: Multiple choice questions/ project/ presentation//field visits/exhibitions/etc. --20 marks

CIA 2: Multiple choice questions/ project/ presentation//field visits/exhibitions/etc. --20 marks

Semester End Examination – 60 marks Question paper covering all units

Four questions of 15 marks each

Each question has an internal option

1. Full length question (from Unit I) 15

OR

1. Full length question (from Unit I) 15

2. Full length question (from Unit II) 15

OR

2. Full length question (from Unit II) 15

3. Full length question (from Unit III) 15

OR

3. Full length question (from Unit III) 15

4. Full length question (from Unit IV) 15

OR

4. Full length question (from Unit IV) 15

Syllabus Framework as per LOCF**Format of Submission of project/ presentation//field visits/exhibitions**

Name of the Department :	Paper: _	Course Code:	Name of the
Student:	Roll No:	Div:	Date: Type of Assessment:
Marks: / 20			

Assessment Pattern of project/ presentation//field visits/exhibitions

Type of Assessment	Written work	Presentation	Overall Conduct	Total
Project	10	05	05	20
Presentation	10	05	05	20
Field Visit	10	05	05	20
Exhibition	10	05	05	20