



GOVERNMENT OF TAMIL NADU

HIGHER SECONDARY FIRST YEAR

PHYSICS

VOLUME - I

A publication under Free Textbook Programme of Government of Tamil Nadu

Department of School Education

Untouchability is Inhuman and a Crime

Government of Tamil Nadu

First Edition - 2018

Revised Edition - 2019, 2020, 2022

(Published Under New Syllabus)

NOT FOR SALE

Content Creation



State Council of Educational
Research and Training

© SCERT 2018

Printing & Publishing



Tamil NaduTextbook and Educational
Services Corporation

www.textbooksonline.tn.nic.in

CONTENTS

PHYSICS

UNIT	TITLE	Page No.	Month
1	Nature of Physical World and Measurement	01	Jun
2	Kinematics	41	Jun-Jul
3	Laws of Motion	105	Jul-Aug
4	Work, Energy and Power	167	Aug
5	Motion of System of Particles and Rigid Bodies	208	Sep
	Appendix 1	266	
	Appendix 2	290	
	Appendix 3	297	
	Appendix 4	298	
	Glossary	300	



E-book



Assessment

HOW TO USE THE BOOK

Scope of Physics

- Awareness on higher learning -courses, institutions and required competitive exams
- Financial assistance possible to help students to climb academic ladder



Learning Objectives:

- Overview of the unit
- Gives clarity on the goals and intention of the topics



- Additional facts related to the topics covered to facilitate curiosity driven learning

Example problems

- To ensure understanding, problems/illustrations are given at every stage before advancing to next level



- Visual representation of concepts with illustrations
- Videos, animations, and tutorials



ICT

- To harness the digital skills to class room learning and experimenting

Summary

- Recap of salient points of the lesson

Concept Map

- Schematic outline of salient learning of the unit

Evaluation

- Evaluate students' understanding and get them acquainted with the application of physical concepts to numerical and conceptual questions

Books for Reference

- List of relevant books for further reading

Solved examples

- Numerical/conceptual questions are solved to enable students to tackle standard problems in mechanics in appendix 1

Competitive Exam corner

- Model Questions - To motivate students aspiring to take up competitive examinations such as NEET, JEE, Physics Olympiad, JIPMER etc

Appendix

- Additional information including the chronological development of physics is provided

Glossary

- Scientific terms frequently used with their Tamil equivalents

Physics learning - Correct method

- The correct way to learn is to understand the concept, express the same in the language of mathematics which are equations.
- Each equation conveys the meaning of a phenomena or relationship between various parameters in the equations. Such relationship can be diagrammatically expressed as graphs.
- This interlink should be clear in mind while going through the entire text.

Value addition of the book

- Mathematical topics such as vectors, differentiation and integration are essential to understand and express physical phenomena.
- Inclusion of these topics and usage of vector notation wherever necessary is the salient feature of this book.
- Becoming familiar with vector notations and basic mathematics for physics will solve a lot of difficulty currently faced by students pursuing higher education in engineering, technology and science disciplines.

Scope of Physics - Higher Education



Exams

- JEE-Joint Entrance Examination
- Physics Olympiad Exam
- NEET- National Eligibility and Entrance Test
- NEST- National Entrance Screening Test
- AIEEE- All India Engineering Entrance Exam
- AIIMS- All India Institute of Medical Science (Entrance Examination)
- JIPMER- Jawaharlal Institute of Postgraduate Medical Education and Research (Entrance Examination)
- KVPY- Kishore Vaigyanik Protsahan Yojana
- JAM- Joint Admission Test
- TIFR GS- Tata Institute of Fundamental Research Graduate School Admissions Examination
- JEST- Joint Entrance Screening Test
- NET- National Eligibility Test (CSIR and UGC)
- GATE-Graduate Aptitude Test in Engineering
- ICAR -AIEEE-Indian Council of Agricultural Research All India Entrance Examination



After completing +2

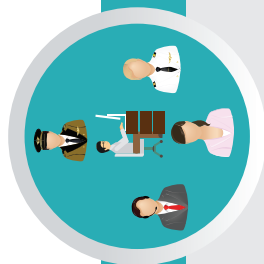
- B.Sc (Physics)
- Integrated M.Sc (Physics) (Central Universities)
- Integrated M.Sc (in Central Research Institutes through NEST and KVPY with stipend)
- B.Sc./B.S./B.Stat./B.Math./M.S. in Mathematics, Chemistry and Biology. (KVPY)
- B.E/B.Tech/ B.Arch (JEE, AIEEE in IITs and NITs)
- MBBS/ B.D.S/B.Pharm (NEET, JIPMER, AIIMS)
- B.Sc. (Agriculture) (ICAR -AIEEA)
- Dual Degree Program BS & MS (JEE, JEST in IITs and IISERs)
- B.Sc (Hospitality administration)
- B.Sc (Optoelectronics)
- B.Sc (Optometry)
- B.Tech (Optics and Optoelectronics)



After completing undergraduate course in Physics (B.Sc Physics)

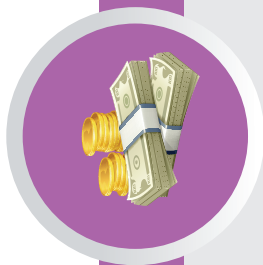
- M.Sc. (Physics) (In Central and State Universities and Colleges)
- M.Sc. Physics (JAM in IISc ,IITs and NITs)
- M.Sc. (In State and Central Universities)
- Medical Physics
- Materials Science
- Energy
- Earth Sciences
- Space science
- Oceanography
- Remote sensing
- Electronics
- Photonics
- Optoelectronics
- Acoustics
- Applied electronics
- Astronomy and Astrophysics
- Nanoscience and Nanotechnology
- Biostatistics
- Bio informatics
- Vacuum sciences

Opportunities after B.Sc. Physics



Jobs in Government Sector

- Indian Forest Services
- Scientist Job in ISRO, DRDO, CSIR labs
- Union Public Service Commission
- Staff selection commission
- Indian Defence services etc.
- Public sector Bank
- State PCS
- Grade III & Compiler Post
- Tax Assistant
- Statistical Investigator
- Combined Higher Secondary
- Combined Graduate Level Exam etc.

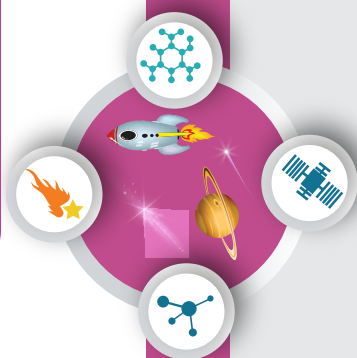


Financial assistance to pursue higher education

Scholarships for graduate and post graduate courses

- International Olympiad: for getting stipend for Higher Education in Science and Mathematics
- DST – INSPIRE Scholarships (for UG and PG)
- DST – INSPIRE Fellowships (for Ph.D)
- UGC National Fellowship (for Ph.D)
- Indira Gandhi Fellowship for Single girl child (for UG and PG)
- Maulana Azad Fellowship for minorities (for Ph.D)
- In addition various fellowships for SC/ST/PWD, OBC etc are available.
- Visit website of University Grants Commission (UGC) and Department of Science and Technology (DST)

Institutes in india to pursue research in physics



After completing Post Graduate course in Physics (M.Sc Physics)

Topics of Research

- Quantum Physics and Quantum Optics
- Astrophysics, Astronomy
- String theory, Quantum gravity
- Mathematical Physics, Statistical Mechanics
- Quantum Field Theory
- Particle Physics and Quantum Thermodynamics
- Quantum information theory
- Condensed Matter Physics, Materials Science
- Electro magnetic Theory
- Black Holes, Cosmology
- Crystal Growth, Crystallography
- Spectroscopy, Atomic, Molecular and Optical Physics
- Nano Science and Nanotechnology
- Energy and Environment Studies
- Biophysics, Medical Physics
- Cryptography, Spintronics
- Optics and Photonics
- Meteorology and Atmospheric Science



Research Institutions in various areas of science		
Name of the Institution		Website
Indian Institute of Science (IISc) Bangalore		www.iisc.ac.in
Raman Research Institute (RRI) Bangalore		www.rri.res.in
Institute of Mathematical Sciences (IMSc) Chennai		www.imsc.res.in
Indian Association for Cultivation of Science (IACS) Calcutta		www.iacs.res.in
Chennai Mathematical Institute (CMI) Chennai		www.cmi.ac.in
Tata Institute of Fundamental Research (TIFR) Mumbai		www.tifr.res.in
Bhabha Atomic Research centre (BARC) Mumbai		www.barc.gov.in
SN Bose centre Basic Natural science Calcutta		www.bose.res.in
Indian Institute of Space Science and Technology (IIST) Trivandrum		www.iist.ac.in
Physics Research Laboratory (PRL) Ahmedabad		www.prl.res.in
Indian Institute of Astrophysics (IIA) Bangalore		www.iia.res.in
Institute of Physics (IOP) Bhubaneswar		www.iopb.res.in
Institute for Plasma Research (IPR) Gujarat		www.ipr.res.in
Inter university centre for Astronomy and Astrophysics (IUCAA) Pune		www.iucaa.in
Indira Gandhi centre for Atomic Research (IGCAR), Kalpakkam		www.igcar.gov.in
Hyderabad central university, Hyderabad		www.uohyd.ac.in
Delhi University, Delhi		www.du.ac.in
Mumbai University, Mumbai		www.mu.ac.in
SavitribaiPhule Pune university, Pune		www.unipune.ac.in
National Institute of Science Education and Research (NISER), Bhubaneswar		www.niser.ac.in
IISER Educational Institutions		www.iiseradmission.in
Indian Institute of Technology in various places (IIT's)		www.iitm.ac.in
National Institute of Technology (NITs)		www.nit.edu
Jawaharlal Nehru University (JNU)		www.jnu.ac.in
Central Universities		www.ugc.ac.in
State Universities		https://www.ugc.ac.in
CSIR – Academy (National laboratories, Delhi, Hyderabad, Trivandrum, Chennai, Calcutta etc)		

