



**THIRD YEAR BACHLOR OF SCIENCE MAJOR
PHYSICS REVISED SYLLABUS ACCORDING TO
CBCS NEP 2020**

**COUERSE TITLE: MATHEMATICAL & STASTICAL PHYSICS
SEMESTER: V
W.E.F. 2025-2026**

**Recommended by the Board of Studies in PHYSICS
And**

Approved by the Academic Council

Devrukh Shikshan Prasarak Mandal's

**Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal.Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India**

Academic Council Item No: 02/2025

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Physics
Name of the Class	:	Third Year
Semester	:	Fifth
Paper	:	II
No. of Credits	:	02
Title of the Course	:	Mathematical & Statistics
Course Code	:	S306PHT
Name of the Vertical in adherence to NEP 2020	:	Elective I
Eligibility for Admission	:	Any student admitted to Third year of B. Sc, degree programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Formative and Summative
Level	:	5.5
Pattern of Marks Distribution for TE and CIA	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2025-2026
Ordinances /Regulations (if any)		

Syllabus for Third Year of Bachelor of Science in Physics

(With effect from the academic year 2025-2026)

Semester -V

Paper No.– 1

Course Title: Mathematical & Statistical

No. of Credits - 02

Type of Vertical: Elective I

Course Code: S306PHT

After completing the course, the learner will be able to.....

Course Outcome	Course Learning Outcome
CO-01	Understand the concept of Probability and Complex variable
CO-02	Apply the Second order Differential equation with physical problem
CO-03	Understand the concept of Microstates and its configuration
CO-04	Understand the concept Maxwell- Boltzmann, Bose-Einstein, Fermi-Dirac statistics

Syllabus for Third Year of Bachelor of Science in Physics

(With effect from the academic year 2025-2026)

Semester -V

Paper No.– 1

Course Title: Mathematical & Statistical

No. of Credits - 02

Type of Vertical: Elective

Course Code: S306PHT

	COURSE CONTENT		
Module	Content	Credits	Lectures
I	Mathematical 1. Random variables, continuous distributions binomial & Poisson distribution Ref: MB – 15.1-15.9 2. Functions of complex variables: The exponential and trigonometric functions, hyperbolic functions, logarithms, complex roots and powers MB: 2.11 to 2.16 3. Second-order nonhomogeneous equations with constant coefficients, partial differential equations, some important partial differential equations in physics, method of separation of variables. CH :5.2.4, 5.3.1 to 5.3.4	01	15
II	Statistical 1. Microstates and configurations. The probability of a distribution The most probable distribution, Maxwell- Boltzmann statistics, Physical meaning of the Boltzmann distribution law ,Molecular speeds. concept of dominant configurations. ER: 13.1 to 13.5, 14.1, 14.2, 2. Bose-Einstein statistics, Black-body radiation, The Rayleigh-Jeans formula, Planck radiation formula, Fermi-Dirac statistics AB : 15.2 to 15.5, 16.1 to 16.6	01	15
	Total	02	30

References:

1.	MB: Mathematical Methods in the Physical sciences: Mary L. Boas Wiley India, 3rd ed.
2.	ER: Thermodynamics, Statistical Thermodynamics and Kinetics: T. Engel and P. Reid (Pearson).
3.	AB: Perspectives of Modern Physics: Arthur Beiser, (Mc Graw Hill International).
4.	CH: Introduction to Mathematical Methods: Charlie Harper (PHI Learning).

Additional References:

1	Mathematical Physics: H. K. Das, S. Chand & Co.
2	Statistical Physics: F. Reif (Berkeley Physics Course, McGraw Hill)
3	Introductory Statistical Mechanics: R. Bowley and M. Sanchez (Oxford Science Publications).
4	Mathematical Physics: A K Ghatak, Chua – 1995 Macmillian India Ltd.

Access to the Course

The course is available for all the students admitted for Third Year Bachelor of Science.

Methods of Assessment

The assessment pattern would be 60:40, 60% for Semester End Examination (SEE) and 40% for Continuous Internal Assessment (CIA). The structure of the SEE and CIA would be as recommended by the Board of Studies and approved by the Board of Examination and the Academic Council of the college.

Pattern of Evaluation

The Examination/Evaluation pattern shall be framed by the Board of Examination with its final approval from the Academic Council of the College.