



Shiksha Mandal's  
**Bajaj College of Science, Wardha (Autonomous)**  
**Department of Physics**  
*In Association with*  
**Anand Niketan College, Warora**  
*Organizes*



**Certificate Course in**  
**"Astronomy and Indian Space Science"**

**Specifications of Course:**

|                                   |                      |
|-----------------------------------|----------------------|
| A) Nature                         | - Certificate Course |
| B) Number of Credits              | - 2*                 |
| C) Duration                       | - 30 hrs (3 months)  |
| D) No. of Students to be admitted | - 25                 |
| E) Fee Proposed                   | - 500/-              |

**I. COURSE OVERVIEW:**

This course provides an understanding of basics of Astronomy and Astrophysics. It will also cover the milestones of Indian space program.

**II. ELIGIBILITY: UG/PG (Pursuing)**

**III. COURSE OBJECTIVES:**

The objective of the course is to impart knowledge and skills to the learner to:

- Understand universe and its content.
- Aware about Indian space Science program and achievements.

**IV. EXPECTED COURSE OUTCOMES:**

After completion of this course, the student will be able to demonstrate the knowledge and will have the ability to:

- CO1: Recognize universe and its content.
- CO2: Describe about history of universe.
- CO3: State basic knowledge of our own solar system.
- CO4: Explain how stars are formed.
- CO5: Recognise about Life cycle of stars.
- CO6: Review about astronomical telescopes
- CO7: Explain about Indian space Science program and achievements.

\* This credit may be uploaded to Digi locker through ABC ID which may be used for further process under NEP 2020.

# SYLLABUS

## Astronomy and Indian Space Science

### Unit I (8 Hours)

**History of Universe:** Big Bang Theory, time line of Universe, formation of galaxies, Types of Galaxies, The Milky Way (shape, size, clusters). size of a planet ( $d=D.\alpha$ ), distance of a planet by parallax method ( $D=b/\theta$ ).

### Unit II (8 Hours)

**Solar System:** Structure of Sun and Solar interior, planets, and their natural satellites, dwarf planets and their natural satellites, asteroids belt, comets, Astronomical Telescopes (basics)

### Unit III (8 Lectures)

**Life cycle of a star:** Nebula and Formation of stars, life span of star, size of star, Stellar spectra, death of star. Red Giant, Super Red Giant, Nova, Super Nova, White dwarf, Neutron Star, Black hole.

### Unit IV (6 Lectures)

**Indian Space Science:** History of ISRO, Types of satellites, Fuel used in satellite, major launches by ISRO, Indian Human Spaceflight Programme.

## Project Work/Excursion/Field visit


Project is a part of Theory examination. Project should be carried out by the student under the supervision of Guide/Teacher. The examination shall be conducted by External and Internal Examiners. Students are supposed to present their work through seminar.

One day orientation program at Astro Club Wardha is mandatory as a part of theory (Unit II) for understanding of Astronomical Telescopes. Students will also be oriented regarding project report writing.

### Mode of Teaching:

The theory lectures of the course will be conducted via virtual mode through pre-recorded video lectures and/or online lectures.

**Certificate of completion:** The students appearing for the final exam will only be eligible for the certificate of completion at the end of the course.



Course Coordinator  
Dr. S. R. Tiple  
BCS, Wardha



CHAIRMAN, Board of Studies  
Department of PHYSICS  
Bajaj College of Science, WARDHA



Course Facilitator  
Dr. P. V. Tekade  
BCS, Wardha

Principal  
Bajaj College of Science  
Wardha