

AC /27.06.2023 / RS(1)



SIES

College of Arts,
Science &
Commerce (Autonomous)

RISE WITH EDUCATION

NAAC REACCREDITED - 'A' GRADE

SIES COLLEGE OF ARTS, SCIENCE AND COMMERCE

(Autonomous)

Affiliated to

UNIVERSITY OF MUMBAI

Syllabus for SEM I

Program Name: BA & BCOM

Class: FYBA & FYBCOM

Course: Open Elective 1 - Logical Reasoning and Mental Ability

Offered By: Department of Physics

(Choice Based Credit System (CBSC) with effect from the academic year 2023–2024 under NEP)

SEMESTER-I

Open Elective – I

Course Overview:

The Basic Astronomy course provides a fundamental understanding of the principles and concepts of astronomy, exploring the wonders of the universe and our place within it. This course covers a wide range of topics, including celestial objects, the solar system, stars and galaxies, the history of astronomy, expansion of the universe and recent astronomical discoveries. Through lectures, discussions, and practical exercises, students will develop observational skills and gain insights into the scientific methods used in astronomy. Reference materials from reputable sources will be utilized to enhance the learning experience.

Scheme of examination:

(i) Tutorials: Internal (Continuous evaluation): 50 marks

Sr. No.	Particulars	Marks
1.	6 of 8 tutorial assignment/ based on the curriculum to be assessed by the teacher concerned and active participation in routine class instructional deliveries.	30
2.	One Class Test to be conducted in the given semester.	20

(ii) Theory: Semester End Examination: 50 marks

Each theory paper shall be of two hour duration. Each unit will have 25 marks weightage. All questions are compulsory and will have internal options.

A candidate will be allowed to appear for the examination only if the candidate attends at least 75% of lectures and tutorials and submits at least 6 tutorials.

Open Elective Course – 1

Course Code	Title	Credits
SIUPYOE111	Logical Reasoning and Mental ability	4

Course outcome:

CO1. Understand logical reasoning using Venn diagram, symbolism and pattern

CO2. Understand the concept of arithmetic and logical deduction reasoning.

CO3. Understand the concept of data interpretation

UNIT I: Data interpretation skill and reasoning

15 hours

1. Venn diagram, Blood relation, Symbolism, Pattern, Seating arrangement, odd man out and series.
2. Data interpretation – Percentage, Pie, line chart etc...

UNIT II: Mental ability and Arithmetic skills

15 hours

1. Average, Problem of ages, Profit and loss, Simple interest, Compound interest, Ratio and proportion, Partnership.
2. Time, work and distance, Problems on train, Probability, Logical deduction.

Note: A good number of numerical examples are expected to be covered during the prescribed lectures.

References:

1. R.S. Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, S. Chand publications
2. R.S. Aggarwal, Quantitative Aptitude, S. Chand publications

Additional references:

1. Trishna Knowledge Systems, Data interpretation and logical reasoning for CAT, Pearson
2. Sinha & Nishit, Data Interpretation and Logical Reasoning
3. Vijay, S. Quantitative Aptitude: For Officers / Office Assistant Exams in IBPS, SBI, RBI, LIC, GICs....

4. Sharma, Arun, How to prepare for Quantitative Aptitude for the CAT: 5th ed

Tutorial based on paper **Logical Reasoning and Mental ability (SIUPYOE111) (2 credits / 30hrs)**

1. Venn diagram
2. Deciphering jumbled up description and relation puzzles
3. number series, alpha numeric series, pattern series
4. symbolism and pattern
5. data interpretation using pie and line chart
6. Finding percentage, simple and compound interest
7. Averages, profit and loss
8. Time work and distance
9. logical deduction
10. Probability



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Syllabus for SEM II

Program Name: BA & BCOM

Class: FYBA & FYBCOM

Course: Open Elective 2 - Basic Astronomy

Offered By: Department of Physics

(Choice Based Credit System (CBSC) with effect from the academic year 2023–2024 under NEP)

SEMESTER-II**Open Elective - II****Course Overview:**

The Basic Astronomy course provides a fundamental understanding of the principles and concepts of astronomy, exploring the wonders of the universe and our place within it. This course covers a wide range of topics, including celestial objects, the solar system, stars and galaxies, the history of astronomy, expansion of the universe and recent astronomical discoveries. Through lectures, discussions, and practical exercises, students will develop observational skills and gain insights into the scientific methods used in astronomy. Reference materials from reputable sources will be utilized to enhance the learning experience.

Scheme of examination:**(i) Tutorials: Internal (Continuous evaluation): 50 marks**

Sr. No.	Particulars	Marks
1.	6 of 8 tutorial assignment/ based on the curriculum to be assessed by the teacher concerned and active participation in routine class instructional deliveries.	30
2.	One Class Test to be conducted in the given semester.	20

(ii) Theory: Semester End Examination: 50 marks

Each theory paper shall be of two hour duration. Each unit will have 25 marks weightage. All questions are compulsory and will have internal options.

A candidate will be allowed to appear for the examination only if the candidate attends at least 75% of lectures and tutorials and submits at least 6 tutorials.

Open Elective Course – II

Course Code	Title	Credits
SIUPYOE121	Basic Astronomy	4

Course outcome:

- CO1. Introduce participants to the fundamental concepts and principles of astronomy.
 CO2. Familiarize participants with the night sky and teach them how to observe celestial objects.
 CO3. Provide an understanding of our solar system, including the planets, moons, and other objects.
 CO4. Explore the life cycle of stars, galaxies, and the universe as a whole.
 CO5. Develop practical skills in stargazing and using telescopes.
 CO6. Encourage curiosity and a deeper appreciation for the wonders of the cosmos.

Unit I

1. Brief history of astronomy and its significance, Introduction to the scientific method in astronomy, Discussion on the scale of the universe and celestial objects. Distance measurement.
2. Observing the sky: Basics of naked-eye observations (Day and night sky), True and apparent Magnitude. Understanding constellations, stars, and planets (How do we know the earth is spinning?), Size of the earth, Introduction to sky maps and star charts (Coordinates of heaven), Tips for stargazing and observing celestial events.
3. The moon and its phases: Exploration of Earth's natural satellite, the Moon, Understanding lunar phases, tides and eclipses, Notable lunar features and missions

Unit II

1. The Solar System: Structure and formation of the Solar System, Exploration of planets, moons, and other objects, Discussion on the Sun, asteroids, comets, and meteoroids, Overview of the planets in our Solar System, Characteristics, atmospheres, and notable features of each planet,
2. Stars and stellar evolution: Characteristics of stars and their classification, binary stars, The life cycle of stars and stellar evolution, Stellar phenomena such as supernovae and black holes.
3. Milky way and other galaxies: Overview of the Milky Way galaxy, Types and properties of galaxies, Introduction to cosmology and the study of the universe, The Big Bang theory and the origin of the universe, Expansion of the universe and Hubble's Law, Dark matter and dark energy
4. Introduction to telescope: Types of telescopes and their functions, Understanding telescope components and terminology, Tips for choosing and using a telescope

References:

1. "Astronomy: A Beginner's Guide to the Universe" by Eric Chaisson and Steve McMillan.
2. "The Backyard Astronomer's Guide" by Terence Dickinson and Alan Dyer.
3. "NightWatch: A Practical Guide to Viewing the Universe" by Terence Dickinson.
4. "Astronomy Beginner's guide" by William H. Waller
5. "Astronomy Demystified" By Stan Gibilisco

Tutorial/workshop/experiment/(problem solving sessions) based on Basic Astronomy (2 credits / 30hrs)

1. Use of homemade sextant for measuring the height of a structure, angles of the star. Estimation of latitude and time and tilt of earth using elevation of pole star. (multiple experiments)
2. Measurement of distance using various methods.
3. Plotting graph of various properties of planets with distance. (multiple experiments)
4. Tracking the star to measure the rate of rotation of the earth.
5. Study the globe.
6. Measurement of time using the position of the star.
7. Measuring the temperature of a light source from the intensity and known distance. (using Stefan's law/Wein's displacement law)
8. Experiment (demonstration) on tidal forces.
9. Experiment (demonstration) on doppler effect
10. Experiment (demonstration) on lens system.
11. Understanding Foucault Pendulum.
12. Mapping intensity distribution in a room using an LDR or the variation of intensity throughout a day.
13. To learn how to use a sky map, learn to locate constellations, stars and planets at any time of year.
14. Scaling the positions of the planets, place the sun at the centre of the paper, and use the concentric circles as the orbits.

Demonstrations including Audio visual demonstration can be carried out, followed by a problem-solving session. Minimum 6 tutorials from the above list should be submitted in a semester. Report on one industrial visit/star gazing session being equivalent to 2 tutorials sessions.