



Shri Shivaji Education Society Amravati's
Science College, Nagpur



Certificate Course on Explorations in Astronomy



Course Coordinator – Dr. S. W. Anwane

Action Taken Report

This course has provided the Understanding for Fundamental Concepts: Thorough understanding of basic astronomical concepts, including the structure and scale of the universe. This course gives the Explanation of Solar System Dynamics. Describes the components and dynamics of the solar system, including the Sun, planets, moons, and smaller bodies. It makes to Comprehend Stellar Processes along with the Explanation processes involved in star formation, stellar evolution, and the end stages of stars. It also Explores Cosmological Concepts and Discusses the key concepts in cosmology, such as the Big Bang theory, dark matter, dark energy, and the overall fate of the universe. It Engages the student with Current Research and makes to Stay informed about recent discoveries and current research in astronomy, including the impact of space missions and technological advancements.

This course has provided a solid foundation in astronomy, preparing students for further study or a lifelong appreciation of the field.

**Shri Shivaji Education Society Amaravati's
Science College Congress Nagar, Nagpur
Department of Physics**

**“Explorations in Astronomy”
Course For Postgraduate Physics Students
Duration: 10/01/2020- 20/03/2020
Course Coordinator: Dr. S. W. Anwane**

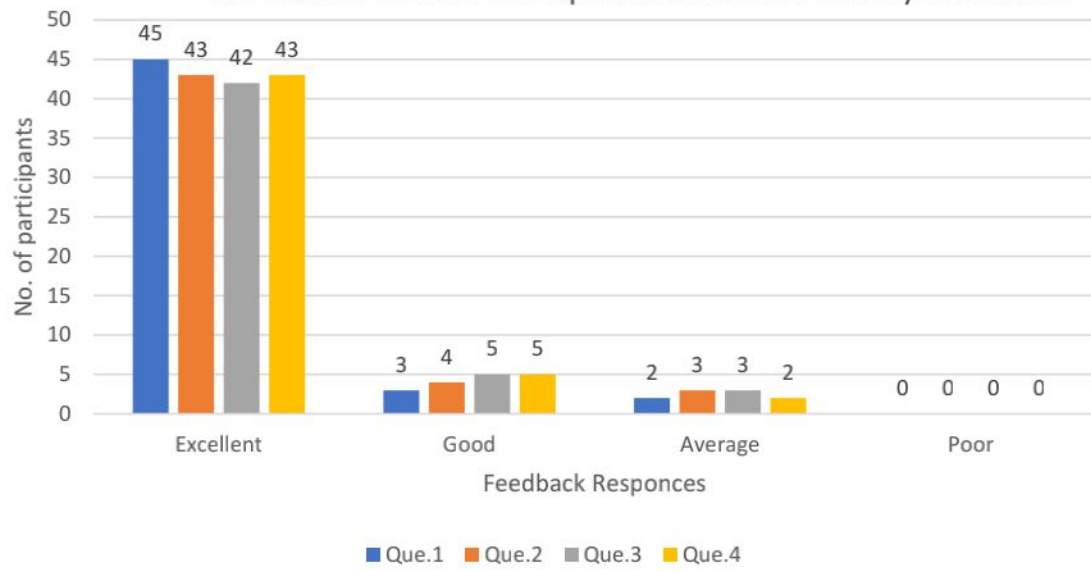
Feedback form

Explorations in Astronomy Course Feedback Questionnaire

Name (optional):

- 1) How would you rate the overall quality of the course content?
 Excellent
 Good
 Average
 Poor
- 2) How relevant was the course content to your professional or academic goals?
 Excellent
 Good
 Average
 Poor
- 3) How would you rate the course with its importance in today's Modern world?
 Excellent
 Good
 Average
 Poor
- 4) How would you rate the availability and quality of resources (e.g., textbooks, online materials)?
 Excellent
 Good
 Average
 Poor

Certificate Course on Exploration in Astronomy Feedback



To,
The Principal
SSES Amt's Science College,
Congress Nagar, Nagpur-12

Subject: For permission to conduct the add on courses in the Physics department

Respected Sir,

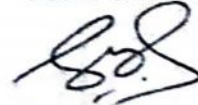
This is to request you that, the teachers of our Physics department have prepared the syllabus and modules of the 30 hours certificate courses for the session 2019-2020.

The details of the course module, syllabus and time table is submitted here with.

Hence please permit to run the add on courses and oblige me.

Thanking you

Yours sincerely



Date:- 21/06/2019

Dr. S. W. Anwane
Professor and Head
Department of Physics
Shri Shivaji Education Society Amravati's
SCIENCE COLLEGE
Congress Nagar, Nagpur.

*Permitted
A. Ghore*

Shri Shivaji Education Society Amravati's

Science College

Congress Nagar, Nagpur

Department of Physics

Add-on Certificate Course

(2019-2020)

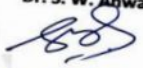
Certificate Course: Explorations in Astronomy

Notice

Date: 01/01/2020

The Department of Physics is conducting an **Add-on Certificate Course on Explorations in Astronomy** for the session **2019-20** from **10/01/2020 to 20/03/2020**. Interested students of B.Sc. Part I, Part II & Part III should register themselves in early and contact to the Course Coordinator Dr. S. W. Anwane immediately.

Course	Admission Fees
Certificate Course: Explorations in Astronomy	Free

Course Coordinator
Dr. S. W. Anwane

Dr S W Anwane
Professor & Head
Department of Physics
Shri Shivaji Education Society Amravati's
Science College
Congress Nagar, Nagpur 440012

**Shri Shivaji Education Society Amaravati's
Science College Congress Nagar, Nagpur.
Department of Physics**

2019-2020

Certificate Course: Explorations in Astronomy

Course Overview: This add-on course is designed to provide undergraduate students with a deeper understanding of astronomy beyond the introductory level. Through a combination of lectures, discussions, observation sessions, and hands-on activities, students will explore fundamental concepts, recent discoveries, and cutting-edge research in astronomy.

Course Objectives:

- ❖ The course "Explorations in Astronomy" aims to provide students with a comprehensive understanding of astronomical concepts, phenomena, and the universe's structure and dynamics.
- ❖ The objective is to cultivate an appreciation for the scientific method, critical thinking, and the vastness and complexity of the cosmos.
- ❖ This course will introduce students to the fundamentals of astronomy, including celestial objects, astronomical observations, and the physical laws governing the universe.

Course Duration: (10 weeks) 30 Hours: From 10/01/2020- 20/03/2020

Course Outline:

Chapter 1: Introduction to Astronomy

- Overview of the universe: scales and structures
- Historical development of astronomy
- Celestial coordinates and motions
- Observational techniques in astronomy
- Introduction to astronomical instruments

Chapter 2: Observational Astronomy

- Optical telescopes and observatories
- Radio, infrared, ultraviolet, X-ray, and gamma-ray astronomy
- Data analysis and image processing
- Stellar and planetary spectroscopy
- Hands-on observation sessions (if feasible)

Chapter 3: The Solar System

- Formation and evolution of the solar system
- Planetary atmospheres and surfaces
- Moons, asteroids, comets, and meteoroids
- Exploration of the solar system: robotic missions and human spaceflight
- Exoplanets and the search for life beyond Earth

Chapter 4: Stars and Stellar Evolution

- Properties of stars: luminosity, temperature, mass, and size
- Stellar classification and the Hertzsprung-Russell diagram
- Stellar formation and protostellar evolution
- Main sequence evolution, stellar structure, and nucleosynthesis
- Stellar remnants: white dwarfs, neutron stars, and black holes

Chapter 5: Galaxies and Cosmology

- Types and properties of galaxies
- Galaxy formation and evolution
- Large-scale structure of the universe
- Dark matter and dark energy
- Cosmological models: Big Bang theory and its implications

Chapter 6: Extragalactic Astronomy and Cosmology

- Galaxy clusters and superclusters
- Cosmological probes: cosmic microwave background radiation, baryon acoustic oscillations
- Dark matter and its effects on galaxy dynamics
- Cosmic evolution: from the early universe to the present
- Recent discoveries and open questions in cosmology

Course Outcomes:

- **Understand Fundamental Concepts:** Thorough understanding of basic astronomical concepts, including the structure and scale of the universe.
- **Utilize Observational Tools:** Effectively use astronomical tools and techniques, such as telescopes and spectroscopy, to gather and analyse data.
- **Explain Solar System Dynamics:** Describe the components and dynamics of the solar system, including the Sun, planets, moons, and smaller bodies.
- **Comprehend Stellar Processes:** Explain the processes involved in star formation, stellar evolution, and the end stages of stars.

- **Explore Cosmological Concepts:** Discuss key concepts in cosmology, such as the Big Bang theory, dark matter, dark energy, and the overall fate of the universe.
- **Engage with Current Research:** Stay informed about recent discoveries and current research in astronomy, including the impact of space missions and technological advancements.

This course provides a solid foundation in astronomy, preparing students for further study or a lifelong appreciation of the field.



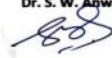

Assessment: Final Exam will be taken using MCQ type questions.

Resources:

- Textbooks: "An Introduction to Modern Astrophysics" by Bradley W. Carroll and Dale A. Ostlie, "Foundations of Astrophysics" by Barbara Ryden and Bradley M. Peterson, "Cosmology: The Science of the Universe" by Edward Harrison, etc.

The Structure of Syllabus and system of evaluation -

Course	Theory Paper	Total Marks
Certificate Course on Explorations in Astronomy	Theory paper- Certificate Course on Explorations in Astronomy *Theory examination will be of MCQ pattern having 50 questions each with equal marks.	Theory
		100

 Internal Quality Assurance Cell (IQAC) S. S. E. S. A. Science College Congress Nagar, Nagpur.	 Principal S. S. E. S. Amravati's Science College, Nagpur.	 Course Coordinator Dr. S. W. Anwane  Dr S W Anwane Professor & Head Department of Physics Shri Shivaji Education Society Amravati's Science College Congress Nagar, Nagpur 440012
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**Shri Shivaji Education Society Amravati's
Science College, Congress Nagar, Nagpur
Session 2019-2020**

Certificate Course: Explorations in Astronomy (10 weeks)

Timetable

Sr. No.	Day	Theory
1	Friday	SWA (C6) Theory 4.00 PM – 5.00 PM
2	Saturday	SWA (C6) Theory, 4.00 PM – 5:00 PM
3		SWA (C6) Theory, 5.00 PM – 6.00 PM

**Shri Shivaji Education Society Amaravati's
Science College Congress Nagar, Nagpur
2019-2020**

Certificate Course: Explorations in Astronomy (10 Week)

Registration Sheet

Sr. No.	Name of Students
1	BHARTI – BOPCHE
2	SHANTANU P CHAVAN
3	LOKESH D GUPTA
4	VIPLAV V KAMBLE
5	ANUJ M KHAPEKAR
6	PRIYANKA S KIRTIWAR
7	SURAJ R MANDHARE
8	SANKET S MASRAM
9	ISHA K MESHRAM
10	MANSHREE P MENDHULKAR
11	GANESH A MORE
12	JANAVI C NIMKAR
13	KHUSHI M PANJAWNI
14	TRUPTI A AKHARE
15	ANIRUDDHA S ANASANE
16	RASHMI P BALKI
17	PRAGATI U BHAGAT
18	PRUTHA S BHAKE
19	RUTUJA V BHANDARKAR
20	DHANASHRI S BINEKAR
21	PRATYUSH P BORKAR
22	ASHISH O CHANDEKAR
23	UJJWALA R CHAPLE
24	BHARAT S KURVE
25	VRUSHALI D LOKHANDE
26	TAPAS T MALLIK
27	HEMA P MASKE
28	ARPIT R MESHRAM
29	ADITI P MOHATKAR

30	AKASH B MUJBAILE
31	ASHWINI S NAIK
32	ROHIT L NAKHATE
33	ROINI C PATRE
34	PALLAVI S AGALAWA
35	KRUTIK S BHONGADE
36	SUNAYAN D BONDRE
37	BHAVANA A CHANDEKAR
38	SAURABH S CHOUDHARI
39	SHRUTI M CHAUHAN
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44	NAMISHA U BADWAIK
45	PURVA P BHARATI
46	OM P BUDDEKER
47	VEDANG V CHATTE
48	ANIKET G DHANDE
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Course Coordinator
Dr. S. W. Anwane



Dr S W Anwane
Professor & Head
Department of Physics
Shri Shivaji Education Society Amravati's
Science College
Congress Nagar, Nagpur 440012

Shri Shivaji Education Society Amravati's

Science College

Congress Nagar, Nagpur

Department of Physics

Add-on Certificate Course

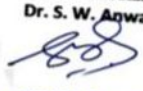
(2019-2020)

Certificate Course: Explorations in Astronomy

NOTICE

Date: 20/03/2020


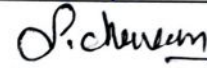
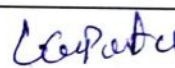
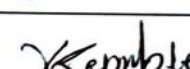
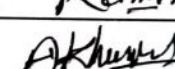
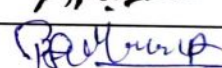
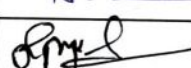
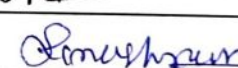
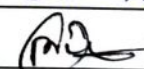
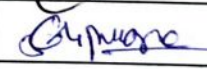
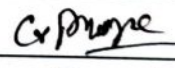
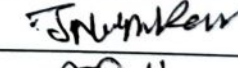
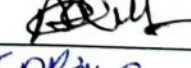
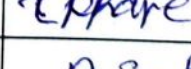
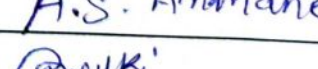
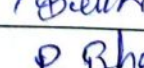
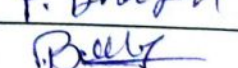
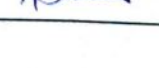
All the registered students of add-on Course on **Explorations in Astronomy** under Department of Physics for the session **2019-20** are hereby informed that the theory examination is to be scheduled on **28/03/2020** at **10:30 am to 12:30 am** in Physics Laboratory at our college Centre. All Students should be present in the laboratory before 10 mins. of scheduled time of examination.

Course Coordinator
Dr. S. W. Anwane

Dr S W Anwane
Professor & Head
Department of Physics
Shri Shivaji Education Society Amravati's
Science College
Congress Nagar, Nagpur 440012

Shri Shivaji Education Society Amaravati's
Science College Congress Nagar, Nagpur.
Department of Physics

2019-2020

Certificate Course: Explorations in Astronomy

Attendance Sheet		
Sr. No.	Name of Students	Signature
1	BHARTI BOPCHE	
2	SHANTANU P CHAVAN	
3	LOKESH D GUPTA	
4	VIPLAV V KAMBLE	
5	ANUJ M KHAPEKAR	
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21	PRATYUSH P BORKAR	P Borkar
22	ASHISH O CHANDEKAR	A Chandekar
23	UJJWALA R CHAPLE	U. Chaple
24	BHARAT S KURVE	B Kurve
25	VRUSHALI D LOKHANDE	V. Lokhande
26	TAPAS T MALLIK	Tapas T.
27	HEMA P MASKE	H Maske
28	ARPIT R MESHRAM	A Meshram
29	ADITI P MOHATKAR	A Mohatkar
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32	ROHIT L NAKHATE	R Nakhate
33	ROINI C PATRE	R Patre
34	PALLAVI S AGALAWE	P Agalawe
35	KRUTIK S BHONGADE	K Bhongade
36	SUNAYAN D BONDRE	Sunayan D Bondre
37	BHAVANA A CHANDEKAR	B Chandekar
38	SAURABH S CHOUDHARI	S Choudhari
39	SHRUTI M CHAUHAN	S Chauhan
40	KANCHAN A DIGAMBARE	K Digambare
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45	PURVA P BHARATI	P Bharati

46	OM P BUDDEKER	om p buddeker
47	VEDANG V CHATTE	Member
48	ANIKET G DHANDE	Aniket
49	RUTUJA N GHARAT	R. N. Gharat
50	SHRUTI V INGLE	Shruti



Course Coordinator

Prof. S. W. Anwane

**Shri Shivaji Education Society Amaravati's
Science College Congress Nagar, Nagpur
Department of Physics**

Session 2019-2020

Add-on Certificate Course on Explorations in Astronomy

THEORY EXAM

Max. Time: 2 Hour
Max. Marks: 100

Date: 28/03/2020
Marks Obtained:

Student Name: -----

Note: i) All questions are compulsory and carry equal marks
ii) Tick the correct option only

Sign. Of Invigilator:

1. What is the primary component of the Sun?

- A. Hydrogen
- B. Helium
- C. Oxygen
- D. Carbon

2. What is the closest planet to the Sun?

- A. Venus
- B. Earth
- C. Mercury
- D. Mars

3. Which planet is known as the "Red Planet"?

- A. Jupiter
- B. Mars
- C. Saturn
- D. Neptune

4. What is the largest planet in our solar system?

- A. Earth
- B. Saturn
- C. Jupiter

D. Uranus

5. Which planet has the most extensive ring system?

- A. Jupiter
- B. Saturn
- C. Uranus
- D. Neptune

6. What is the name of the galaxy that contains our Solar System?

- A. Andromeda Galaxy
- B. Milky Way Galaxy
- C. Sombrero Galaxy
- D. Whirlpool Galaxy

7. How long does it take for light from the Sun to reach Earth?

- A. 8 minutes
- B. 24 hours
- C. 1 second
- D. 12 minutes

8. What is the name of the second brightest object in the night sky?

- A. Mars
- B. Sirius
- C. Venus
- D. Betelgeuse

9. Which planet is known for its Great Red Spot?

- A. Jupiter
- B. Mars
- C. Saturn
- D. Neptune

10. Which celestial object was demoted from its planet status in 2006?

- A. Eris
- B. Ceres
- C. Haumea
- D. Pluto

11. What is the main difference between a comet and an asteroid?

- A. Comets have tails
- B. Asteroids are made of ice
- C. Comets orbit the Earth

D. Asteroids are always larger

12. Which of the following is the closest star to Earth?

- A. Proxima Centauri
- B. Alpha Centauri A
- C. Barnard's Star
- D. Betelgeuse

13. What is the term for a star that has exhausted its nuclear fuel and collapsed?

- A. Supernova
- B. White Dwarf
- C. Black Hole
- D. Neutron Star

14. Which type of galaxy is the Milky Way?

- A. Elliptical
- B. Irregular
- C. Spiral
- D. Lenticular

15. What is the most common type of star found in the universe?

- A. Red Giant
- B. White Dwarf
- C. Red Dwarf
- D. Blue Giant

16. How old is the Universe estimated to be?

- A. 4.5 billion years
- B. 13.8 billion years
- C. 20 billion years
- D. 1 billion years

17. What phenomenon explains the redshift of galaxies?

- A. Doppler Effect
- B. Gravitational Lensing
- C. Parallax
- D. Cosmic Inflation

18. What is the name of the first artificial satellite to orbit Earth?

- A. Apollo 11
- B. Sputnik 1
- C. Explorer 1
- D. Vostok 1

19. What is the term for the boundary around a black hole beyond which nothing can escape?

- A. Event Horizon
- B. Singularity
- C. Schwarzschild Radius
- D. Photon Sphere

20. Which planet in our solar system has the highest mountain?

- A. Earth
- B. Mars
- C. Venus
- D. Mercury

21. What is the name of the galaxy that is on a collision course with the Milky Way?

- A. Triangulum Galaxy
- B. Andromeda Galaxy
- C. Whirlpool Galaxy
- D. Large Magellanic Cloud

22. What is the term for the apparent backward motion of a planet as seen from Earth?

- A. Retrograde Motion
- B. Prograde Motion
- C. Precession
- D. Nutation

23. Who proposed the heliocentric model of the solar system?

- A. Galileo Galilei
- B. Isaac Newton
- C. Nicolaus Copernicus
- D. Johannes Kepler

24. What is the most abundant element in the universe?

- A. Oxygen
- B. Hydrogen
- C. Helium
- D. Carbon

25. Which spacecraft was the first to reach interstellar space?

- A. Pioneer 10
- B. Voyager 1
- C. New Horizons
- D. Cassini

26. What is the name of the effect that causes stars to twinkle?

- A. Diffraction
- B. Refraction
- C. Scintillation
- D. Dispersion

27. Which planet has the shortest day?

- A. Earth
- B. Jupiter
- C. Mars
- D. Venus

28. What is a pulsar?

- A. A type of neutron star
- B. A type of black hole
- C. A type of white dwarf
- D. A type of red giant

29. What is the name of our galaxy's supermassive black hole?

- A. Andromeda A
- B. Cygnus X-1
- C. Sagittarius A*
- D. M87*

30. What is the primary method used to detect exoplanets?

- A. Direct Imaging
- B. Gravitational Microlensing
- C. Transit Method
- D. Radio Signals

31. What is the term for the line dividing the day and night sides of a planetary body?

- A. Equator
- B. Meridian
- C. Terminator
- D. Prime Meridian

32. What is the main sequence stage of a star's life?

- A. The initial formation
- B. The longest phase of stable hydrogen burning
- C. The final collapse into a white dwarf
- D. The explosive supernova stage

33. What type of object is the Crab Nebula?

- A. A planetary nebula
- B. A supernova remnant
- C. A star-forming region

D. A galaxy

34. What phenomenon occurs when the Moon passes directly between the Earth and the Sun?

- A. Solar Eclipse
- B. Lunar Eclipse
- C. New Moon
- D. Full Moon

35. Which planet has a day longer than its year?

- A. Mercury
- B. Venus
- C. Mars
- D. Neptune

36. What is the name of the first manned mission to land on the Moon?

- A. Apollo 11
- B. Apollo 13
- C. Gemini 8
- D. Mercury 7

37. What is the term for the path that an object follows as it moves around another object in space?

- A. Axis
- B. Orbit
- C. Rotation
- D. Revolution

38. What is the Kuiper Belt?

- A. A region of the Sun's atmosphere
- B. A region of the Earth's atmosphere
- C. A region of the solar system beyond Neptune
- D. A region between Mars and Jupiter

39. What is a light year?

- A. The time it takes for light to travel around Earth
- B. The distance light travels in one year
- C. The time it takes for light to travel from the Sun to Earth
- D. The time it takes for light to travel across the Milky Way

40. What causes the different phases of the Moon?

- A. The Earth's rotation
- B. The Moon's rotation on its axis
- C. The relative positions of the Earth, Moon, and Sun
- D. The Moon's distance from the Earth

41. **What is the primary purpose of a telescope in astronomy?**

- A) To detect radio waves
- B) To magnify distant objects
- C) To analyze the chemical composition of stars
- D) To observe the motion of planets

42) **Which planet in our solar system has the most extensive ring system?**

- A) Earth
- B) Jupiter
- C) Saturn
- D) Uranus

43) **What is a light-year?**

- A) The time it takes for light to travel around the Earth
- B) The distance light travels in one year
- C) The average distance between the Earth and the Sun
- D) The distance between the Earth and the Moon

44) **Which of the following celestial objects is the largest?**

- A) Neutron star
- B) Comet
- C) Asteroid
- D) Black hole

45) **What causes the phases of the Moon?**

- A) The Earth's shadow on the Moon
- B) The Moon's rotation on its axis
- C) The relative positions of the Earth, Moon, and Sun
- D) Changes in the Moon's shape

46) **What is the main factor that determines the lifecycle of a star?**

- A) Its distance from Earth
- B) Its mass
- C) Its chemical composition
- D) Its rotation speed

47) **Which galaxy is closest to the Milky Way?**

- A) Andromeda Galaxy
- B) Triangulum Galaxy
- C) Large Magellanic Cloud
- D) Small Magellanic Cloud

48) **What is a supernova?**

- A) A newly formed star
- B) The explosion of a dying star
- C) A black hole forming event
- D) A planet forming event

49) **Which of the following best describes a quasar?**

- A) A small, icy body in the Kuiper belt
- B) A distant, extremely luminous active galactic nucleus
- C) A large planet with a strong magnetic field
- D) A type of neutron star

50) **What is the name of the first artificial satellite launched into space?**

- A) Apollo 11
- B) Hubble Space Telescope
- C) Sputnik 1
- D) Voyager 1

Answer key

1. A. Hydrogen
2. C. Mercury
3. B. Mars
4. C. Jupiter
5. B. Saturn
6. B. Milky Way Galaxy
7. A. 8 minutes
8. C. Venus
9. A. Jupiter
10. D. Pluto
11. A. Comets have tails
12. A. Proxima Centauri
13. B. White Dwarf
14. C. Spiral
15. C. Red Dwarf
16. B. 13.8 billion years
17. A. Doppler Effect
18. B. Sputnik 1
19. A. Event Horizon
20. B. Mars
21. B. Andromeda Galaxy

22. A. Retrograde Motion
23. C. Nicolaus Copernicus
24. B. Hydrogen
25. B. Voyager 1
26. C. Scintillation
27. B. Jupiter
28. A. A type of neutron star
29. C. Sagittarius A*
30. C. Transit Method
31. C. Terminator
32. B. The longest phase of stable hydrogen burning
33. B. A supernova remnant
34. A. Solar Eclipse
35. B. Venus
36. A. Apollo 11
37. B. Orbit
38. C. A region of the solar system beyond Neptune
39. B. The distance light travels in one year
40. C. The relative positions of the Earth, Moon, and Sun
41. B. To magnify distant objects
42. C. Saturn
43. B. The distance light travels in one year
44. D. Black hole
45. C. The relative positions of the Earth, Moon, and Sun
46. B. Its mass
47. A. Andromeda Galaxy
48. B. The explosion of a dying star
49. B. A distant, extremely luminous active galactic nucleus
50. C. Sputnik 1



Shri Shivaji Education Society, Amravati's
SCIENCE COLLEGE
 Congress Nagar, Nagpur-12 (M.S.), India



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 A "College with Potential for Excellence" identified by UGC New Delhi.
 Institutional Member of APQN
 Recognized Centre for Higher Learning and Research
 Mentor College under 'PARAMARSH Scheme', UGC, New Delhi

Add-on Course

Course Exam Name: Certificate Course in Explorations in Astronomy

Name of Student:

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Roll No.:

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Session: 2019-20

Test Date: 28/03/2020

Max. Marks: 80

Invigilator Signature

Obtained Marks:

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INSTRUCTIONS FOR FILLING THE SHEET

1. This sheet should not be folded or crushed.
2. Use only blue/ black ball point pen to fill the circles.
3. Use of pencil is strictly prohibited.
4. Circles should be darkened completely and properly.
5. Cutting and erasing on this sheet is not allowed.
6. Do not use any stray marks on the sheet.
7. Do not use marker or white fluid to hide the mark.

WRONG METHODS

CORRECT METHOD



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2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	32	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	42	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	33	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	43	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	25	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	35	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	45	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	26	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	36	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	46	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	27	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	37	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	47	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	28	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	38	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	48	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	29	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	39	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	49	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	30	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	40	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	50	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Shri Shivaji Education Society Amaravati's
Science College Congress Nagar, Nagpur
2019-2020**

Certificate Course: Explorations in Astronomy (10 Week)

Marksheet

Sr. No.	Full Name of Student	Total Marks (100)	Grade obtained
1	BHARTI - BOPCHE	52	C
2	SHANTANU P CHAVAN	90	A+
3	LOKESH D GUPTA	72	B
4	VIPLAV V KAMBLE	90	A+
5	ANUJ M KHAPEKAR	90	A+
6	PRIYANKA S KIRTIWAR	60	B
7	SURAJ R MANDHARE	76	A
8	SANKET S MASRAM	54	C
9	ISHA K MESHRAM	60	B
10	MANSHREE P MENDHULKAR	90	A+
11	GANESH A MORE	70	B
12	JANAVI C NIMKAR	94	A+
13	KHUSHI M PANJAWNI	90	A+
14	TRUPTI A AKHARE	62	B
15	ANIRUDDHA S ANASANE	70	B
16	RASHMI P BALKI	72	B
17	PRAGATI U BHAGAT	90	A+
18	PRUTHA S BHAKE	62	B
19	RUTUJA V BHANDARKAR	78	A
20	DHANASHRI S BINEKAR	66	B
21	PRATYUSH P BORKAR	82	A
22	ASHISH O CHANDEKAR	62	B
23	UJJWALA R CHAPLE	84	A
24	BHARAT S KURVE	90	A+
25	VRUSHALI D LOKHANDE	76	A
26	TAPAS T MALLIK	80	A

27	HEMA P MASKE	78	A
28	ARPIT R MESHRAM	72	B
29	ADITI P MOHATKAR	80	A
30	AKASH B MUJBAILE	90	A+
31	ASHWINI S NAIK	64	B
32	ROHIT L NAKHATE	90	A+
33	ROINI C PATRE	76	A
34	PALLAVI S AGALAWE	74	B
35	KRUTIK S BHONGADE	82	A
36	SUNAYAN D BONDRE	76	A
37	BHAVANA A CHANDEKAR	65	B
38	SAURABH S CHOUDHARI	50	C
39	SHRUTI M CHAUHAN	48	C
40	KANCHAN A DIGAMBARE	54	C
41	ANJALI A FULKAR	78	A
42	DEENA R GAUTAM	44	C
43	ANUJ C GHATATE	78	A
44	NAMISHA U BADWAIK	72	B
45	PURVA P BHARATI	76	A
46	OM P BUDDEKER	68	B
47	VEDANG V CHATTE	90	A+
48	ANIKET G DHANDE	84	A
49	RUTUJA N GHARAT	96	A+
50	SHRUTI V INGLE	76	A

A+ Grade => Marks=90 and above,

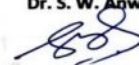
A Grade =>Marks=75 and <90

B Grade =>Marks=60 and <75,

C Grade =>Marks=40 and <60,

Fail Grade =>Marks<40

Course Coordinator
Dr. S. W. Anwane



Dr S W Anwane
Professor & Head
Department of Physics
Shri Shivaji Education Society Amravati's
Science College
Congress Nagar, Nagpur 440012

**Shri Shivaji Education Society Amaravati's
Science College Congress Nagar, Nagpur
Department of Physics**

REPORT

Undergraduate Course for Physics Students

“EXPLORATIONS IN ASTRONOMY”

Duration: (10 weeks) 30 Hours: 10/01/2020 – 20/03/2020

Total Students: 50

This 10-week add-on course provided B.Sc. Physics students with a comprehensive understanding of the “EXPLORATIONS IN ASTRONOMY”. The course was conducted by Dr. G. L. Jadhav, Assistant Professor, Department of Physics SSES Amt's Science College Congress Nagar, Nagpur. Total 50 Students of B.Sc. II and III, year Physics were enrolled for the course.

The course covered theoretical principles and real-world applications. The students were evaluated through MCQ based final exam of 100 marks. All 50 students successfully completed the course.

The 10-week of “explorations in astronomy” course was a valuable addition to the undergraduate physics curriculum, equipping students with essential knowledge and skills in electronics. The course successfully combined theoretical foundations with, preparing the students for further studies and careers in Astronomy and related fields.



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CERTIFICATE

Mr./Ku. **Anuj M. Khapekar** is awarded with certificate on successful completion of the course entitled, Certificate course in Advanced Ceramic and Composites.

Session 2019-20 under Add-on course conducted for 30 hours from 10/01/2020 to 20/03/2020 by Department of Physics, SSESAs, Science College, congress Nagar, Nagpur 440012.

He/She has passed the Examination with 'A+' Grade.

Dr. S. W. Anwane
Coordinator, Department of Physics

Prof. M. P. Dhore
Principal, Science College