

**Bossier Parish Community College**  
**Master Syllabus**

**Course Prefix and Number:** SCI 101

**Credit Hours:** 3

**Course Title:** Foundations in Science I

**Course Prerequisites:** None

**Textbook:** Tillery, B.W.; Integrated Science, 8<sup>th</sup> edition

**Course Description:** A survey course in physics and the physical sciences for non-science majors.

**Learning Outcomes:**

At the end of this course, the student will

- A. relate fundamental principles of physics and astronomy to understand the natural world; and
- B. apply critical thinking, observation, and analysis skills to the development of scientific thinking.

To achieve the learning outcomes, the student will

1. define basic terms related to science and measurement. (A)
2. explain the difference between the English & metric systems of measurement. (A,B)
3. distinguish between mass and weight. (A,B)
4. determine direct proportion, inverse proportion, square, and inverse square relationships between variables. (A,B)
5. understand each step in the scientific method. (A,B)
6. understand the requirements of a scientific experiment. (A,B)
7. distinguish between a scientific law, theory, non-science, and pseudoscience. (A,B)
8. explain motion and the forces that cause motion. (A,B)
9. define terms related to measuring motion. (A)
10. understand how friction, inertia, and free fall are related to motion. (A,B)
11. briefly explain and apply Newton's laws of motion. (A)
12. explain the law of conservation of momentum. (A)
13. differentiate between speed and velocity. (A,B)
14. understand Newton's universal law of gravitation and how it relates to gravity. (A,B)
15. distinguish between energy, work, and power. (A)
16. identify the units used for measuring energy, work, and power. (A)
17. understand the law of conservation of energy. (A)
18. compare and contrast the forms of energy. (A)
19. explain the interchangeability of energy. (A)

20. identify the most common energy sources used today. (A)
21. explain what conservation of energy means scientifically. (A,B)
22. identify sources of alternative energy. (A)
23. define terms related to molecules. (A)
24. differentiate between the phases of matter. (A)
25. identify the three temperature scales and understand how they differ. (A,B)
26. distinguish between temperature and heat. (A,B)
27. define terms related to measures of heat. (A)
28. describe how heat flows. (A,B)
29. identify and define phase changes. (A)
30. describe the first law of thermodynamics. (A)
31. recognize the terms related to forces and vibrations. (A)
32. differentiate between the different types of waves. (A,B)
33. relate music terms to sound waves. (A)
34. recognize and define terms related to waves, sound waves, and wave interactions. (A)
35. explain the Doppler effect. (A,B)
36. recognize the terms related to electricity. (A)
37. identify the units used for measuring electricity. (A)
38. describe how electrical work is done via the electric field. (A,B)
39. describe how electricity flows and factors that affect its travel. (A,B)
40. distinguish between direct and alternating currents. (A)
41. define an electric circuit. (A)
42. distinguish between luminous and incandescent. (A)
43. identify visible light on the electromagnetic spectrum. (A)
44. understand how temperature is related to visible light. (A,B)
45. describe various properties of light. (A,B)
46. distinguish between reflection and refraction. (A,B)
47. describe polarized light. (A)
48. discuss the dual nature of light. (A,B)
49. describe ways information about stars may be gathered. (A)
50. define terms related to stars, their makeup, brightness, and types. (A)
51. describe what information can be gained by knowing the size and color of a star. (A,B)
52. list the stages of the life of a star. (A)
53. understand characteristics of the Sun and how it compares to other stars. (A,B)
54. define and understand characteristics of a galaxy. (A,B)
55. know the age of the universe. (A)
56. describe the evidence for the big bang theory. (A,B)
57. define and distinguish between dark matter and dark energy. (A,B)
58. define terms related to astronomy and planets. (A)
59. list the qualifications for a body to be a planet. (A)
60. distinguish between and characterize terrestrial and gaseous planets. (A,B)
61. compare and contrast Earth and Venus. (A,B)
62. describe characteristics of the moon and each of the planets.
63. define and characterize asteroids, comets, and the types of meteors. (A)
64. use the nebular hypothesis to explain the formation of the solar system. (A)
65. orally present a scientific topic discussed in this course. (A,B)

66. be able to apply scientific knowledge to answer questions. (A,B)

**Course Requirements:** To earn a grade of “C” or higher the student must earn 70% of the total points for the course and meet all of the following course requirements.

- minimum average of 60% on tests
- minimum average of 60% on the oral presentation and research article summaries

### **Course Grading Scale:**

Course Grading Scale:

A	90% -100%
B	80% - 89%
C	70% - 79%
D	60% - 69%
F	< 59%

**Attendance Policy:** The college attendance policy is available at <http://catalog.bpcc.edu/content.php?catoid=5&navoid=369#class-attendance>

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Revised Apr 04, 2022 Charles Reed