

RSPT 52: APPLIED SCIENCE FOR RESPIRATORY THERAPY

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2022
Units:	3
Hours:	3 lecture per week (36 total per quarter)
Prerequisite:	CHEM 25, 30A or equivalent.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade Only
Repeatability:	Not Repeatable

Student Learning Outcomes

- Define and describe acids, bases and solutions.
- Describe the nature of forces in relation to the physical and physiologic realms.

Description

Basic mathematics and science principles applicable to Respiratory Therapy. Includes algebra review, metric system, behavior of matter, forces, and acids and bases. Intended for students in the Respiratory Therapy Program; enrollment is limited to students accepted in the program.

Course Objectives

The student will be able to:

1. Demonstrate an understanding of mathematics related to respiratory therapy
2. Describe the properties of matter
3. Describe the behavior of gases
4. Perform pressure measurement and conversion
5. Describe the behavior of liquids
6. Describe equilibrium in systems
7. Describe kinetic theory
8. Identify mechanical principles relevant to respiratory therapy
9. Describe acids and bases in relation to respiratory therapy
10. Describe solutions

Course Content

1. Mathematics
 - a. Algebra review
 - b. Significant figures
 - c. Scientific notations
 - d. The metric system
 - i. English metric conversion
 - e. Dimensional calculations
 - i. Distance, area and volume

- f. Temperature scales
 - i. Fahrenheit, Celsius, Kelvin and Rankine
2. The properties of matter
 - a. States of matter
 - i. Solids, liquids, gases and vapors
 - b. Change of state
 3. The behavior of gases
 4. The gas laws
 - a. Boyle's
 - i. Charles'
 - ii. Guy-Lussac's
 - iii. Combined gas law
 - iv. Dalton's
 - v. Graham's
 - vi. Fick's
 - b. Gas behavior
 - i. Compression and expansion
 - ii. Critical temperature and pressure
 5. Pressure measurement and conversion
 6. The behavior of liquids
 - a. Change of state
 - i. Freezing and melting
 - ii. Boiling and evaporation
 - iii. Energy requirements
 - b. Liquid systems and interactions
 - i. Henry's law and solubility coefficients
 - ii. Surface tension and Laplace's laws
 - iii. Cohesion, adhesion and capillary actions
 - iv. Pascal's principle
 - v. Archimedes' principle
 - c. The behavior of vapor
 - i. Poissuille's law
 - ii. Bernoulli's principle
 - iii. Venturi apparatus
 - iv. Viscosity
 - v. Laminar and turbulent flow
 - vi. Reynold's number
 - vii. Coanda effect
 7. Equilibrium in systems
 - a. Pressure
 - b. Concentration
 - c. Osmotic
 - i. Hemolysis and crennation
 - d. Ionic
 8. Kinetic theory
 - a. Brownian motion and diffusion
 9. Mechanical principles
 - a. Friction
 - b. Balance
 - c. Newton's law
 - d. Hooke's law
 10. Acids and bases
 - a. pH scale
 - b. Logarithms and powers of 10
 11. Solutions

- a. Percent strengths
- b. Strength by weight
- c. Molarity
 - i. Moles
 - ii. Avogadro's number
 - iii. Equivalents
- d. Molality
- e. Normality

Lab Content

Not applicable.

Special Facilities and/or Equipment

When taught online, students must have access to a computer with internet access.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Quizzes

Midterm and final exam

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture

Demonstration

Representative Text(s) and Other Materials

Wojciechowski, William V.. Respiratory Care Sciences, 6th ed.. 2014.

While this text is over five years old, it still represents the standard in the field.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

Assigned reading from textbook, approximately one chapter per week averaging 30-50 pages per week.

Discipline(s)

Respiratory Technologies