Pre-Med

Biology	➢ Biology: 2 semesters with lab - BIO 131 | Introduction to Organisms w/ Lab - BIO 132 | Introduction to Cells w/ Lab - BIO 305 | Comparative Vertebrate Anatomy ➢ Biochem with Lab - only required by some programs - BIO 409 | Biological Chemistry w/ Lab
Chemistry	➢ General Chemistry: 2 semesters with lab CHE 130 | General Chemistry 1 w/ Lab CHE 131 | General Chemistry 2 w/ Lab ➢ Organic Chem: 2 semester with lab CHE 212 | Organic Chemistry 1 w/ Lab CHE 213 | Organic Chemistry 2 w/ Lab ➢ Biochemistry CHE 309 | Biochemistry w/ Lab
Physics	➢ Physics: 2 semester with lab PHS 211A | College Physics 1 PHS 212A | College Physics 2
Mathematics	➢ Statistics: Only required by some programs MAT 147 | Statistics Calculus-Only required by some programs MAT 220 | Calculus 1 MAT 221 | Calculus 2
Psychology	➢ General Psychology-Only required by some programs PHY 101| General Psychology
Sociology	➢ Sociology-Only required by some programs SOC 110 | Introduction to Sociology
ENL	➢ English/Writing-Only required by some programs Any Class under ENL

Pre-Dentistry

Biology	➢ Biology: 2 semesters with lab BIO 131 | Introduction to Organism with Lab BIO 131 | Introduction to Cells BIO 305 | Comparative Vertebrate Anatomy BIO 200 | Anatomy and Physiology 1 with Lab BIO 201 | Anatomy and Physiology with Lab BIO 307 | Human Anatomy BIO 405 | Human Physiology BIO 409 | Biological Chemistry with Lab BIO 304 | Microbiology & its Application with Lab
Chemistry	➢ General Chemistry: 2 semesters with lab CHE 130 | General Chemistry 1 CHE 131 | General Chemistry 2 CHE 212 | Organic Chemistry 1 CHE 213 | Organic Chemistry 2 CHE 309 | BioChem with Lab
Physics	➢ Physics: 2 semester with lab PHS 211A | College Physics PHS 212A | College Physics 2
Mathematics	➢ Statistics and Calculus MAT 147 | Statistics MAT 220 | Calculus 1 MAT 221 | Calculus 2
Psychology	➢ General Psychology PSY 101 | General Psychology
ENL	➢ English/Writing: 2 Semester Any classes under ENL

Pre-Vet

Biology	➢ Biology: 2 semesters with lab BIO 131 | Introduction to Organisms w/ Lab BIO 132 | Introduction to Cells w/ Lab BIO 305 | Comparative Vertebrate Anatomy ➢ Biochem or Molecular Bio- 1 or 2 semester with lab BIO 409 | Biological Chemistry w/ Lab BIO 313-Capstone class | Molecular Bio Gene Cloning w/ Lab ➢ Genetics-Only some schools require 1 semester BIO 217 | General Genetics
Chemistry	➢ General Chemistry: 2 semesters with lab CHE 212: Organic Chemistry 1 CHE 213: Organic Chemistry 2 ➢ Biochemistry CHE 309: Biochemistry with Lab
Physics	➢ Physics: 2 semester with lab PHS 211A: College Physics 1 PHS 212A: College Physics 2
Mathematics	➢ Minimum requirement is different for each school and program (Check with school you wish to apply or program you wish to join) MAT 150: A Precal Intro to Functions Check specific school for other requirements
General Education	➢ General Education: Most require 1 to 2 semesters of English, History, Humanities, etc. Required for any degree at SSU

Importance of Maintaining a Strong GPA

A strong GPA is essential for pre-health pathways for many reasons:

- Ensures high placement in competitive admission processes.
- A 3.5 GPA is expected in most schools.
- Beings opportunities for scholarships and financial aid.
- Provides competitive advantage.

GPA Requirements

Pre-Med: 3.79 for MD | 3.59 for DO
Pre-Dentistry: 3.4-3.6
Pre-Vet: 3.5

Key Skills and Knowledge to Develop During Undergraduate Studies

- Critical thinking and problem-solving
- Strong communication skills
- Time management and organization
- Research and Analytical Skills
- Leadership and Teamwork
- Clinical or Volunteer Experience
- Ethics and Professionalism
- Cultural competency

MCAT concepts found in Salem State Courses

- Mendelian Genetics
- Non Mendelian genetics
- Meiosis vs Mitosis
- Recombination Frequency
- Evolution
- Nucleotides and Base Pairing
- DNA Replication
- Central Dogma
- Transcription and mRNA Processing
- Translation and Post Translational Modifications
- Cancer
- Recombinant DNA and Biotechnology
- Control of Gene Expression
- Chromosomes, DNA and RNA
- Hardy-Weinberg Principle

MCAT Contents

Section 1: Biological and Biochemical Foundations of Living Systems: Overview

Mathematical Concepts:

- Linear, semilog, and log-log scales;
- Calculate slopes from data in figures, graphs, and tables;
- Significant digits;
- Reasonable numerical estimates in performing measurements and calculations;
- Metric units | Includes conversion of units within the metric system and between metric and English units (conversion factors will be provided);
- Dimensional analysis (using units to balance equations);
- Arithmetic calculations involving
  - Probability
  - Proportion
  - Ratio
  - Percentage
  - Square-root estimations;
- Algebra II-level understanding of exponentials and logarithms (natural and base 10), scientific notation, and solving simultaneous equations;
- Trigonometric concepts including
  - Definitions of basic (sine, cosine, tangent) and inverse (sin–1, cos–1, tan–1) functions
  - Sin and cos values of 0°, 90°, and 180°

- Relationships between the lengths of sides of right triangles containing angles of 30°, 45°, and 60°;
- Vector addition and subtraction and the right-hand rule.

Not Needed:
- Knowledge of dot and cross products;
- Understanding of calculus.

Section 1 (BBLS) Concepts and Categories

Foundational Concept 1 | Category 1A: Structure and function of proteins and amino acids
- Amino Acids
- Protein Structure
- Non-Enzymatic Protein Function
- Enzyme Structure and Function
- Control of Enzyme Activity

Source: AAMC | Category 1A

Foundational Concept 1 | Category 1B: Transmission of genetic information from gene to protein
- Nucleic Acids Structure and Function
- DNA Replication
- Repair of DNA
- Genetic Code
- Transcription
- Translation
- Eukaryotic Chromosome Organization
- Control of Gene Expression in Eukaryotes
- Recombinant DNA & Biotechnology

Source: AAMC | Category 1B

Foundational Concept 1 | Category 1C: Transmission of heritable information from generation to generation and the processes that increase genetic diversity
- Mendelian Concepts
- Meiosis and Other Factors Affecting Genetic Variability
- Analytic Methods
- Evolution

Source: AAMC | Category 1C

Foundational Concept 1 | Category 1D: Principles of bioenergetics and fuel molecule metabolism

- Principles of Bioenergetics
- Carbohydrates
- Glycolysis, Gluconeogenesis, and the Pentose Phosphate Pathway
- Principles of Metabolic Regulation
- Citric Acid Cycle
- Metabolism of Fatty Acids and Proteins
- Oxidative Phosphorylation
- Hormonal Regulation and Integration of Metabolism

Source: AAMC | Category 1D

Foundational Concept 2 | Category 2A: Assemblies of molecules, cells, and groups of cells within single cellular and multicellular organisms

- Plasma Membrane
- Membrane-Bound Organelles and Defining Characteristics of Eukaryotic Cells
- Cytoskeleton
- Tissues Formed From Eukaryotic Cells

Source: AAMC | Category 2A

Foundational Concept 2 | Category 2B: The structure, growth, physiology, and genetics of prokaryotes and viruses

- Cell Theory
- Classification and Structure of Prokaryotic Cells
- Growth and Physiology of Prokaryotic Cells
- Genetics of Prokaryotic Cells
- Virus Structure
- Viral Life Cycle

Source: AAMC | Category 2B

Foundational Concept 2 | Category 2C: Processes of cell division, differentiation, and specialization

- Mitosis
- Biosignaling
- Reproductive System
- Embryogenesis
- Mechanisms of Development

Source: AAMC | Category 2C

Foundational Concept 3 | Category 3A: Structure and functions of the nervous and endocrine systems and ways in which these systems coordinate the organ systems

- Nervous System: Structure and Function
- Nerve Cell
- Electrochemistry
- Biosignaling
- Lipids
- Endocrine System: Hormones and Their Sources
- Endocrine System: Mechanisms of Hormone Action

Source: AAMC | Category 3A

Foundational Concept 3 | Category 3B: Structure and integrative functions of the main organ systems

- Respiratory System
- Circulatory System
- Lymphatic System
- Immune System
- Digestive System
- Excretory System
- Reproductive System
- Muscle System
- Specialized Cell - Muscle Cell
- Skeletal System
- Skin System

Source: AAMC | Category 3B

Section 2 (CPBS) Concepts and Categories

Foundational Concept 4 | Category 4A: Translational motion, forces, work, energy, and equilibrium in living systems

- Translational Motion
- Force
- Equilibrium
- Work
- Energy of Point Object Systems
- Periodic Motion

Source: AAMC | Category 4A

Foundational Concept 4 | Category 4B: Importance of fluids for the circulation of blood, gas movement, and gas exchange

- Fluids
- Circulatory System
- Gas Phase

Source: AAMC | Category 4B

Foundational Concept 4 | Category 4C: Electrochemistry and electrical circuits and their elements

- Electrostatics
- Circuit Elements
- Magnetism
- Electrochemistry
- Specialized Cell (Nerve Cell)

Source: AAMC | Category 4C

Foundational Concept 4 | Category 4D: How light and sound interact with matter

- Sound
- Electromagnetic Radiation
- Molecular Structure & Absorption Spectra
- Geometrical Optics

Source: AAMC | Category 4D

Foundational Concept 4 | Category 4E: Atoms, nuclear decay, electronic structure, and atomic chemical behavior

- Atomic Nucleus
- Electronic Structure
- The Periodic Table - Classification of Elements into Groups by Electronic Structure
- The Periodic Table - Variations of Chemical Properties with Group and Row
- Stoichiometry

Foundational Concept 5 | Category 5A: Unique nature of water and its solutions

- Acid/ Base Equilibria
- Ions in Solution
- Solubility
- Titration

Source: AAMC | Category 5A

Foundational Concept 5 | Category 5B: Nature of molecules and intermolecular interaction

- Covalent Bond

- Liquid Phase: Intermolecular Forces

Source: AAMC | Category 5B

Foundational Concept 5 | Category 5C: Separation and purification methods

- Separations and Purifications

Source: AAMC | Category 5C

Foundational Concept 5 | Category 5D: Structure, function, and reactivity of biologically-relevant molecules

- Nucleotides and Nucleic Acids
- Amino Acids
- The Three Dimensional Protein Structure
- Non-Enzymatic Protein Function
- Lipids
- Carbohydrates
- Aldehydes and Ketones
- Alcohols
- Carboxylic Acids
- Acid Derivatives
- Phenols
- Polycyclic and Heterocyclic Aromatic Compounds

Source: AAMC | Category 5D

Foundational Concept 5 | Category 5E: Principles of chemical thermodynamics and kinetics

- Enzymes
- Principles of Bioenergetics
- Energy Changes in Chemical Reactions - Thermochemistry, Thermodynamics
- Rate Processes in Chemical Reactions - Kinetics and Equilibrium

Source: AAMC | Category 5E

Section 3 (PSBB) Concepts and Categories

Foundational Concept 6 | Category 6A: Sensing the environment

- Sensory Processing
- Vision
- Hearing
- Other Senses
- Perception

Source: AAMC | Category 6A

Foundational Concept 6 | Category 6B: Making sense of the environment

- Attention
- Cognition
- Consciousness
- Memory
- Language

Source: AAMC | Category 6B

Foundational Concept 6 | Category 6C: Responding to the world

- Emotion
- Stress

Source: AAMC | Category 6C

Foundational Concept 7 | Category 7A: Individual influences on behavior

- Biological Bases of Behavior
- Personality
- Psychological Disorders
- Motivation
- Attitudes

Source: AAMC | Category 7A

Foundational Concept 7 | Category 7B: Social processes that influence human behavior

- How the Presence of Others Affect Individual Behavior
- Group Decision-making Processes
- Normative and Non-normative Behavior
- Socialization

Source: AAMC | Category 7B

Foundational Concept 7 | Category 7C: Attitude and behavior change

- Habituation and Dishabituation; Associative Learning
- Observational Learning
- Theories of Attitude and Behavior Change

Source: AAMC | Category 7C

Foundational Concept 8 | Category 8A: Self-identity

- Self-concept, Self-identity, and Social Identity
- Formation of Identity

Source: AAMC | Category 8A

Foundational Concept 8 | Category 8B: Social thinking

- Attributing Behavior to Persons or Situations
- Prejudice and Bias
- Processes Related to Stereotypes

Source: AAMC | Category 8B

Foundational Concept 8 | Category 8C: Social interactions

- Elements of Social Interactions
- Self-presentation and Interacting with Others
- Social Behavior
- Discrimination

Source: AAMC | Category 8C

Foundational Concept 9 | Category 9A: Understanding social structure

- Theoretical Approaches
- Social Institutions
- Culture

Source: AAMc | Category 9A

Foundational Concept 9 | Category 9B: Demographic characteristics and processes

- Demographic Structure of Society
- Demographic Shifts and Social Change

Source: AAMC | Category 9B

Foundational Concept 10 | Category 10A: Social inequality

- Spatial Inequality
- Social Class
- Health Disparities
- Healthcare Disparities

Source: AAMC | Category 10A

Section 4 (CARS) Concepts and Categories
https://students-residents.aamc.org/media/8731/download

Source: Comprehensive Booklet https://students-residents.aamc.org/media/9261/download