Key Concepts of Chapter 4:
- At one time, bloodstains were linked to a source by A-B-O typing and the characterization of polymorphic blood enzymes and proteins. This approach has now been used less frequently because of newer technologies such as DNA.
- The location, distribution, and appearance of bloodstains and spatters may be useful for interpreting and reconstructing the events that produced the bleeding.
- Surface texture and the stain’s shape, size, and location must be considered when determining the direction, dropping distance, and angle of impact of a bloodstain.

Key Concepts of Chapter 14:
- Serology involves a broad scope of lab tests that use specific antigen and serum antibody reactions.
- An antibody reacts or agglutinates only with its specific antigen. The concept of specific antigen-antibody reactions has been applied to techniques for the detection of drugs of abuse in blood and urine.
- When an animal is injected with an antigen, its body produces a series of different antibodies, all of which are designed to attack some particular site on the antigen of interest. This collection of antibodies is known as polyclonal antibodies.
- The criminalist must be prepared to answer the following questions when examining dried blood: (a) Is it blood? (b) From what species did the blood originate? And (c) If the blood is of human origin, how closely can it be associated with a particular individual?
- The determination of blood is best made by means of a preliminary color test.
- A positive reaction from the Kastle-Meyer color test is highly indicative that the substance being tested for is most likely blood.
- The luminal test is used to search for trace amounts of blood (or blood that has been cleaned up) from a crime scene.
- The precipitin test uses antisera normally derived from rabbits that have been injected with the blood of a known animal to determine the species origin of a questioned bloodstain.
- The best way to locate and characterize a seminal stain is to perform the preliminary color test of acid phosphatase.
- Forensic scientists can successfully link seminal material to an individual by DNA typing.
- A rape victim must undergo a medical exam as soon as possible after a sexual assault. At that time, clothing, hairs, and vaginal and rectal swabs can be collected for subsequent lab analysis.
- If a suspect is apprehended within 24 hours of a sexual assault, it may be possible to detect the victim’s DNA on the suspect’s underwear or on a swab of the suspect’s male genitalia region.

Key Concepts of Chapter 15:
- Portions of the DNA structure are as unique to each individual as fingerprints, except for identical twins.
• The gene is the fundamental unit of heredity. Each gene is composed of DNA specifically designed to control the genetic traits of our cells
• DNA is constructed as a very large molecule made by linking a series of repeating units called nucleotides
• Four types of bases are associated with the DNA structure: (A) adenine; (C) cytosine; (G) guanine; and (T) thymine
• The bases on each stand of DNA are aligned in a double-helix configuration so that adenine pairs with thymine and cytosine pairs with guanine. This concept is known as base pairing and the order of the bases distinguishes different DNA strands
• Portions of the DNA molecule contain sequences of bases that are repeated numerous times. These “tandem repeats” offer a means of distinguishing one individual from another through DNA typing
• In the lab, DNA molecules are cut up by a restriction enzyme and the resulting fragments are sorted out by electrophoresis
• Polymerase chain reaction (PCR) can amplify minute quantities of DNA. The technique evolved from an understanding of how DNA strands naturally replicate within a cell
• The latest method of DNA typing, short tandem repeats (STR) analysis is the most successful and widely used DNA profiling procedure
• STRs are locations on the chromosome that contain short sequences that repeat themselves within the DNA molecule. They serve as useful markers for identification because they are found in great abundance throughout the human genome
• The entire strand of an STR is very short, less than four hundred fifty base pairs long. This makes STRs much less susceptible to degradation and they may often be recovered from bodies or stains that have been subjected to extreme decomposition
• Hundreds of different types of STRs are found in human genes
• Mitochondrial DNA is located outside the cell’s nucleus and is inherited from the mother
• Packaging of bloodstained evidence in plastic or airtight containers must be avoided because the accumulation of residual moisture could contribute to the growth of blood-destruction bacteria and fungi. Each stained article should be packaged separately in a paper bag or in a well-ventilated box

REFERENCE