

**SUL ROSS STATE UNIVESRITY-RIO GRANDE COLLEGE
CASTROVILLE * DEL RIO * EAGLE PASS * UVALDE
DEPARTMENT OF NATURAL & BEHAVIORAL SCIENCES
CRIMINAL JUSTICE PROGAM
COURSE SYLLABUS**

COURSE TITLE: 4337 Introduction to Forensic Science

COURSE PERIOD: Online Web Course

INSTRUCTOR: Dr. Sergio Gonzalez

EMAIL: All correspondence should be made using Sul Ross State University email to sg17iz@sulross.edu

BIOGRAPHY: January 1, 1999-Present: Court-At-Law Judge, Val Verde County.

August 2017 – Present: Adjunct Professor at Sul Ross State University Rio Grande College

November 2, 1990-1998: General Practice of Law with Law Offices of Gonzalez, Gonzalez & Gonzalez, 313 Pecan Street, Del Rio, Texas. Criminal Felony & Misdemeanor, Juvenile, Divorce & Child Custody, Protective Orders, Child Protective Services, Probate, Guardianships & Civil Matters.

May 4, 1986: Juris Doctorate Degree, O.W. Coburn School of Law, Oral Roberts University, Tulsa, Oklahoma.

August 14, 1981: Bachelor of Arts Degree, St. Mary's University, San Antonio, Texas.

May 2, 1976: Del Rio High School Graduate, Del Rio, Texas.

CONTINUING LEGAL EDUCATION STUDY HOURS:

January 1, 1999-Present: 699.00 Total CLE; 105.75 Total Ethics, State Bar of Texas.

JUDICIAL JURISDICTION:

Misdemeanor Criminal; Protective Orders Juvenile Misdemeanor & Felonies; Contested & Uncontested Probate; Guardianships; Adult Protective Services DWI DRUG Specialty Court Divorces & Child Custody Civil Matters.

COURSE DESCRIPTION: An introduction to forensic science, the purpose of this course is to familiarize the criminal justice student with recognition, examination, identification and interpretation of evidence and the modern crime laboratory. The nature of forensic evidence is emphasized along with the limitations that technology and knowledge impose on its individualization and class characterization.

TEXTBOOK:

This course will require MindTap for Forensic Science: Fundamentals & Investigations, 3rd Edition (2021 Cengage). It is important to note that MindTap is required. Do not be scammed by purchasing a used textbook without MindTap.

Purchase Options (pick one):

1. MindTap Access Only (eBook is included) – either of the following ISBNs will grant you access to online materials.

Printed Access Code ISBN: 9781337392242

Instant Access Code ISBN: 9781337392235

2. MindTap Access + Bound Book

Printed Access Code Bundle ISBN: 9780357018118

To Access MindTap, visit the “MindTap Getting Started” Section within Blackboard. Follow the directions provided in the MindTap – Getting Started Training Video.

ACADEMIC SUCCESS:

Students enrolling in online web courses at Rio Grande College must be aware that such courses are not self-paced and require considerable vested time in order to meet requirements. Students should be prepared to devote a considerable amount of time to accomplish the requisites in this course. Each semester will require a student to devote approximately 12 hours per week to each web class – which equates to 3 hours of class time plus 9 hours of reading, research, writing and other course preparation.

COMPUTER LABS:

Rio Grande College computer labs are open Monday – Thursday 8:00AM - 9:00PM and Friday 8:00AM – 5:00PM. **RGC Computer labs are not open weekends.** However, students may avail themselves to the SWTJC computer labs with a valid ID. Online web students should have available a high-speed internet connection on a regular basis for off-campus course work, exams, assignments and research.

DISHONESTY:

Academic cheating and plagiarism is not acceptable behavior. It violates university policy and human ethics. If a violation occurs the penalty will result in the grade of “F” for the semester.

EXAMINATIONS:

Exams and assessments have been structured to mandate maximum participation in this course of study.

- There will be chapter quizzes, tests, and labs each week.
- Chapter reading assignments are of the utmost importance for student learning outcomes and assessment.
- Exams will consist of multi-formatted questions taken from weekly reading assignments.
- It is recommended that all exams be taken in the computer laboratory on the Rio Grande College campus. However, this is not required. Exams may be taken at any location using a high-speed internet connection.
- Weekly assignments will be made available on Mondays at 6:00 am and will be made unavailable on Sundays at 11:59 pm on Cengage, linked through Blackboard. See last page of syllabus for exam schedule and dates.
- Weekly assignments may be attempted a total of 3 times. Exams may not be copied, saved or returned to later. Exams must be completed in one setting.
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NO MAKE-UP EXAMS:

If a student **for any reason:**

- fails to take an exam
 - fails to complete an exam
 - fails to submit an exam
- will result in a failed exam.

The professor assumes no responsibility for student omissions or technology issues. No exams will be reset for any reason. There will be no make-up exams for any reason.

GRADING SCALE:

850 - 950 = A
750 - 849 = B
650 - 749 = C
580 - 649 = D
0 - 579 = F

SEMESTER GRADES:

Final semester grades are reported to the Office of Admissions & Records at the conclusion of each semester and grades are posted on Banner for student review.

COURSE OBJECTIVES:

Upon reading assigned chapters in the textbook with a thorough analysis of the key concepts, terms, scientific principles and

investigative procedures within each chapter the student will acquire extensive knowledge of the following subject-matter materials to be inclusive on each examination. Course includes:

- **CHAPTER 1. FORENSIC SCIENCE AND OBSERVATION**
 - [What Is Forensic Science?](#)
 - [What Do Forensic Scientists Do?](#)
 - [Observation and Perception](#)
 - [Eyewitness Observation](#)
 - [Eyewitness Accounts](#)
 - [The Innocence Project](#)
 - [Improving Observation Skills](#)
 - [Interview Techniques](#)
 - [Summary](#)
 - [Case Studies](#)
 - [Careers in Forensics. Dr. Paul Ekman](#)
 - [Chapter 1. Review Questions](#)
 - [Chapter 1: Bibliography](#)
 - [Activity 1-1. Learning to See](#)
 - [Activity 1-2. You Are an Eyewitness!](#)
 - [Activity 1-3. What Influences Our Observations?](#)
- **CHAPTER 2. CRIME-SCENE INVESTIGATION AND EVIDENCE COLLECTION**
 - [Crime-Scene Investigation](#)

- [The Crime Scene Investigation Team](#)
- [Locard's Principle of Exchange](#)
- [Types of Evidence](#)
- [The Seven S's of Crime-Scene Investigation](#)
 - [Step 1: Securing the Scene](#)
 - [Step 2: Separating the Witnesses](#)
 - [Step 3: Scanning the Scene](#)
 - [Step 4: Seeing the Scene](#)
 - [Step 5: Sketching the Scene](#)
 - [Step 6: Searching for Evidence](#)
 - [Step 7: Securing and Collecting Evidence](#)
- [Mapping the Outdoor Crime Scene](#)
 - [Datum Points and Subdatum Points](#)
 - [Marking Evidence Collecting Limits](#)
 - [Measuring and Marking Evidence Positions](#)
- [Analyzing the Evidence](#)
- [Staged Crime Scenes](#)
- [Advances in Crime-Scene Investigation](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Carl Williams](#)

- [Chapter 2. Review Questions](#)
- [Chapter 2: Bibliography](#)
- [Activity 2-1. Locard's Principle of Exchange](#)
- [Activity 2-2. Crime-Scene Investigation](#)
- **[CHAPTER 3. HAIR ANALYSIS](#)**
 - [Hair as Evidence](#)
 - [History of Hair Analysis](#)
 - [The Science of Hair Analysis](#)
 - [The Functions of Hair](#)
 - [The Life Cycle of Hair](#)
 - [The Structure of Human Hair](#)
 - [Characteristics of Hair](#)
 - [Types of Hair](#)
 - [Hair from Different Parts of the Body](#)
 - [Treated Hair](#)
 - [Ethnic or Ancestral Differences](#)
 - [Nonhuman and Human Hair](#)
 - [Collecting Hair Evidence in an Investigation](#)
 - [Forensic Analysis of Hair](#)
 - [Microscopic Analysis](#)
 - [Chemical Analysis](#)

- [DNA Analysis](#)
- [Advances in Hair Analysis](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. William J. Walsh](#)
- [Chapter 3. Review Questions](#)
- [Chapter 3: Bibliography](#)
- [Activity 3-1. Trace Evidence: Hair](#)
- [Activity 3-2. Hair Measurement](#)
- [Activity 3-3. Hair Testimony Essay](#)
- **[CHAPTER 4. FIBER ANALYSIS](#)**
 - [Fiber as Evidence](#)
 - [History of Fibers](#)
 - [The Science of Fibers](#)
 - [Natural Fibers](#)
 - [Synthetic \(Manufactured\) Fibers](#)
 - [Characteristics of Fibers, Yarns, and Textiles](#)
 - [Yarns](#)
 - [Textiles](#)
 - [Collection of Fiber in an Investigation](#)
 - [Analyzing Fiber Evidence](#)

- [Microscopic Analysis](#)
 - [Chemical and Physical Analysis of Fibers](#)
- [Evaluating the Value of Fiber Evidence](#)
- [Advances in Fiber Analysis](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. Irene Good](#)
- [Chapter 4. Review Questions](#)
- [Chapter 4: Bibliography](#)
- [Activity 4-1. Microscopic Fiber Analysis](#)
- [Activity 4-2. Bedsheet Thread Count](#)
- [Activity 4-3. Weave Pattern Analysis](#)
- [Activity 4-4. Textile Identification](#)
- [Activity 4-5. Burn Analysis of Fibers](#)
- **[CHAPTER 5. FORENSIC BOTANY](#)**
 - [Forensic Botany](#)
 - [Botanical Evidence and Crime Scenes](#)
 - [History of Forensic Botany](#)
 - [Acceptance of Forensic Botany](#)
 - [The Science of Forensic Botany](#)
 - [Dendrochronology](#)

- [Palynology](#)
- [Characteristics of Botanical Evidence](#)
 - [Evidence to Consider: Determining When and Where](#)
 - [Evidence to Consider: Determining Postmortem Interval](#)
 - [Evidence to Consider: Recognizing Gravesites](#)
- [Documenting, Mapping, Collecting, and Packaging Evidence](#)
 - [Documenting the Evidence](#)
 - [Mapping the Evidence](#)
 - [Collecting the Evidence](#)
 - [Packaging the Evidence](#)
- [Analyzing Botanical Evidence](#)
 - [Dendrochronology](#)
 - [Palynology](#)
 - [Limnology](#)
- [Advances in Forensic Botany](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. Lynne Milne](#)
- [Chapter 5. Review Questions](#)
- [Chapter 5: Bibliography](#)
- [Activity 5-1. Comparing Suspect Pollen to Crime-Scene Pollen](#)

- [Activity 5-2. Pollen Expert Witness Presentation](#)
- [Activity 5-3. Botanical Evidence Case Studies Presentation](#)
- [Activity 5-4. Processing a Crime Scene for Botanical Evidence](#)
- [Activity 5-5. Pollen Index](#)
- [Activity 5-6. Isolation of Pollen from Honey](#)
- **CHAPTER 6. FINGERPRINTS**
 - [The History of Fingerprinting](#)
 - [The Science of Fingerprints](#)
 - [Formation of Fingerprints](#)
 - [Characteristics of Fingerprints](#)
 - [Types of Fingerprints](#)
 - [Basic Ridge Patterns](#)
 - [Minutiae and Fingerprint Identification](#)
 - [Collection and Documentation of Fingerprints](#)
 - [Photographing Fingerprints](#)
 - [Methods of Collection](#)
 - [Forensic Analysis of Fingerprinting](#)
 - [How Are Fingerprints Analyzed?](#)
 - [Fingerprint Reliability and Validity](#)
 - [Can Fingerprints Be Altered or Disguised?](#)
 - [Advances in Fingerprinting](#)

- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Peter Paul Biro](#)
- [Chapter 6. Review Questions](#)
- [Chapter 6: Bibliography](#)
- [Activity 6-1. Study Your Fingerprints](#)
- [Activity 6-2. Giant Balloon Fingerprint](#)
- [Activity 6-3. Studying Latent and Plastic Fingerprints](#)
- [Activity 6-4. How to Print a Ten Card](#)
- [Activity 6-5. Minutiae Patterns](#)
- [Activity 6-6. Fingerprint Analysis](#)
- [Activity 6-7. Using Cyanoacrylate to Recover Latent Fingerprints](#)
- **[CHAPTER 7. DNA PROFILING](#)**
 - [What Is DNA Profiling?](#)
 - [History of DNA Profiling](#)
 - [The Science of DNA](#)
 - [Chromosomes](#)
 - [Genes](#)
 - [Characteristics of DNA Profiling](#)
 - [Early DNA Fingerprinting](#)
 - [Short Tandem Repeats \(STRs\)](#)

- [STR Profiles](#)
- [Collection and Preservation of DNA Evidence](#)
- [DNA Profiling Analysis](#)
 - [CODIS](#)
 - [Types of DNA Profiling Analyses](#)
- [Advances in DNA Profiling](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. Kary Banks Mullis](#)
- [Chapter 7. Review Questions](#)
- [Chapter 7: Bibliography](#)
- [Activity 7-1. Simple DNA Extraction](#)
- [Activity 7-2. The Break-In](#)
- [Activity 7-3. Anna Anderson or Anastasia? STR Analysis](#)
- [Activity 7-4. STR Identification of a September 11 Victim](#)
- [Activity 7-5. Identification of the Romanovs Using STR Profiling](#)
- **[CHAPTER 8. BLOOD AND BLOOD SPATTER](#)**
 - [History of Forensic Blood Analysis](#)
 - [The Science of Blood](#)
 - [Blood Cells](#)
 - [White Blood Count and Immune Response](#)

- [Discovery of Blood Types](#)
- [Antigen–Antibody Response](#)
- [Probability and Blood Types](#)
- [Characteristics of Blood Evidence](#)
 - [Forces Affecting Blood Spatter](#)
 - [Directionality of Blood](#)
 - [Common Bloodstain Patterns](#)
 - [Area of Convergence](#)
 - [Angle of Impact Calculations](#)
 - [Area of Origin](#)
- [Investigating Blood Evidence at the Crime Scene](#)
 - [Blood Evidence Tells a Story](#)
 - [Walk-Through and Information Gathering](#)
 - [Documentation of Evidence](#)
 - [Collection of Blood Evidence](#)
- [Analyzing Blood Evidence](#)
 - [Blood Pattern Analysis](#)
 - [Chemical Testing](#)
- [Advances in Blood Analysis](#)
- [Summary](#)
- [Case Studies](#)

- [Careers in Forensics. T. Paulette Sutton](#)
- [Chapter 8. Review](#)
- [Chapter 8: Bibliography](#)
- [Activity 8-1. A Presumptive Test for Blood](#)
- [Activity 8-2. Creating and Modeling Blood-Spatter Patterns](#)
- [Activity 8-3. Blood-Spatter Analysis: Effect of Height on Blood Drops](#)
- [Activity 8-4. Area of Convergence](#)
- [Activity 8-5. Blood-Droplet Impact Angle](#)
- [Activity 8-6. Area of Origin](#)
- [Activity 8-7. Crime Scene Investigation](#)
- **[CHAPTER 9. FORENSIC TOXICOLOGY](#)**
 - [Toxicology](#)
 - [History of Forensic Toxicology](#)
 - [The Science of Toxicology](#)
 - [What Happens Following Exposure to Toxins, Poisons, and Drugs?](#)
 - [Toxicity Factors](#)
 - [Symptoms of Poisoning](#)
 - [Drug Addiction, Withdrawal, and Dependency](#)
 - [Drug Tolerance](#)
 - [Characteristics of Poisons, Toxins, and Drugs](#)

- [Heavy Metals](#)
- [Lethal Gases and Injections](#)
- [Pesticides and Herbicides](#)
- [Toxins](#)
- [Drugs and Drug Schedules](#)
- [Processing Evidence](#)
 - [Evidence Detection](#)
 - [Evidence Documentation and Collection](#)
 - [Evidence Packaging](#)
- [Forensic Analysis of Poisons, Toxins, and Drugs](#)
 - [Preliminary Testing](#)
 - [Confirmatory Testing](#)
 - [Testing for Acute or Chronic Poisoning](#)
 - [Expert Witness Testimony](#)
- [Advances in Forensic Toxicology](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. Don Catlin](#)
- [Chapter 9. Review Questions](#)
- [Chapter 9: Bibliography](#)
- [Activity 9-1. Drug Analysis](#)

- [Activity 9-2. Should Medical Marijuana Be Legalized in All States?](#)
- [Activity 9-3. Drug Spot Test](#)
- **CHAPTER 10. HANDWRITING ANALYSIS, FORGERY, AND COUNTERFEITING**
 - [Document Analysis](#)
 - [History of Forensic Handwriting Analysis](#)
 - [The Science of Handwriting](#)
 - [Characteristics of Handwriting](#)
 - [Forensic Analysis of Handwriting](#)
 - [Analyzing a Handwriting Sample](#)
 - [Handwriting Evidence in the Courtroom](#)
 - [Shortcomings of Handwriting Analysis](#)
 - [Forgery](#)
 - [Check Forgery](#)
 - [Literary Forgery](#)
 - [Art Forgery](#)
 - [Detecting Forgery](#)
 - [Counterfeiting](#)
 - [Counterfeit Currency](#)
 - [Detecting Counterfeit Currency](#)
 - [Counterfeit Items and Fraud](#)
 - [Advances in Analysis, Detection, and Prevention](#)

- [Handwriting Analysis: Computerized Analysis](#)
- [Handwriting Analysis: Biometric Signature Pads](#)
- [Forgery: N-Gram Tracing](#)
- [Forgery: Paper Analysis](#)
- [Forgery: Ink Analysis](#)
- [Forgery: Infrared Reflectography](#)
- [Counterfeiting: Banknote Technology](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Lloyd Cunningham](#)
- [Chapter 10. Review Questions](#)
- [Chapter 10: Bibliography](#)
- [Activity 10-1. Handwriting Analysis](#)
- [Activity 10-2. Analysis of a Ransom Note and Report to Jury](#)
- [Activity 10-3. Examination of U.S. Currency: Is It Authentic or Counterfeit?](#)
- **[CHAPTER 11. FORENSIC ENTOMOLOGY](#)**
 - [Forensic Entomology](#)
 - [History of Forensic Entomology](#)
 - [The Science of Forensic Entomology: Insects and Decomposition](#)
 - [Decomposition](#)

- [Blowflies \(Bottle Flies\): First in Succession](#)
- [Houseflies, Flesh Flies, and Coffin Flies](#)
- [Beetles and Other Insects of Decomposition](#)
- [Characteristics of Forensic Entomology](#)
 - [Insects and PMI Estimates](#)
 - [Factors Affecting Development](#)
 - [Accumulated Degree Hours](#)
 - [Limitations of Forensic Entomology](#)
- [Processing a Crime Scene for Insect Evidence](#)
 - [Insect Collection Procedures](#)
- [Analysis of Insect Evidence](#)
 - [Insect Identification](#)
 - [Victim Identification Based on Insect Evidence](#)
 - [Determining Victim's Exposure to Drugs, Alcohol, or Toxins Based on Insect Evidence](#)
 - [Determining Victim's Physical Conditions Based on Insect Evidence](#)
- [Advances in Forensic Entomology](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. Neal Haskell](#)

- [Chapter 11. Review Questions](#)
- [Chapter 11: Bibliography](#)
- [Activity 11-1. How to Raise Blowflies for Forensic Entomology](#)
- [Activity 11-2. Mini Projects for Forensic Entomology](#)
- [Activity 11-3. Observation of Blowflies or Houseflies](#)
- [Activity 11-4. Factors Affecting Postmortem Interval Estimates and ADH](#)
- **[CHAPTER 12. DEATH: MANNER, MECHANISM, CAUSE](#)**
 - [The Importance of Examining Death](#)
 - [History of Death Examinations](#)
 - [A History of Coroners and Corruption](#)
 - [The Science of Death Examinations](#)
 - [Manner of Death](#)
 - [Cause and Mechanism of Death](#)
 - [The Process of Death](#)
 - [Characteristics of Death](#)
 - [Algor Mortis](#)
 - [Livor Mortis](#)
 - [Rigor Mortis](#)
 - [Postmortem Changes in the Eye](#)
 - [Stages of Decomposition](#)
 - [Decomposition Timeline](#)

- [Rate of Decomposition](#)
- [Death-Scene Investigations](#)
 - [Processing the Crime Scene](#)
- [Forensic Analysis of Death](#)
 - [The Autopsy](#)
 - [PMI Estimates](#)
 - [Probable Cause of Death Analysis](#)
- [Advances in Death Investigations](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. Michael Baden](#)
- [Chapter 12. Review Questions](#)
- [Chapter 12: Bibliography](#)
- [Activity 12-1. Calculating PMI Using Rigor Mortis](#)
- [Activity 12-2. Calculating PMI Using Algor Mortis](#)
- [Activity 12-3. Tommy the Tub](#)
- [Activity 12-4. Analysis of Evidence from Death Scenes](#)
- **[CHAPTER 13. SOIL EVIDENCE](#)**
 - [Soil as Evidence](#)
 - [History of Forensic Soil Examination](#)
 - [The Science of Soil](#)

- [Soil Formation](#)
- [Soil Texture](#)
- [Soil Chemistry](#)
- [Soil Profiles](#)
- [Soil and Decomposition](#)
- [Characteristics of Sand](#)
 - [Formation of Sand](#)
 - [Rounding and Aging of Sand](#)
 - [Mineral Composition of Sand](#)
 - [Source of Sand](#)
 - [Sorting of Sand](#)
- [Photographing, Documenting, Collecting, and Packaging Soil Evidence](#)
 - [Using Soil to Locate Gravesites](#)
- [Analysis of Soil Evidence](#)
 - [Microscopic Analysis](#)
 - [Macroscopic Analysis](#)
 - [Physical Analysis](#)
 - [Chemical Analysis](#)
 - [Biological Analysis](#)
- [Advances in the Detection and Analysis of Soil Evidence](#)
- [Summary](#)

- [Case Studies](#)
- [Careers in Forensics. Dr. Rob Fitzpatrick](#)
- [Chapter 13. Review Questions](#)
- [Chapter 13: Bibliography](#)
- [Activity 13-1. Sand Observation](#)
- [Activity 13-2. Sorting of Sand Using Sieve Plates](#)
- [Activity 13-3. Sorting of Sand by Size and Shape](#)
- [Activity 13-4. Examination of Sand and Mineral Percentages](#)
- [Activity 13-5. Chemical and Physical Analysis of Sand](#)
- [Activity 13-6. Soil Evidence Examination](#)
- **[CHAPTER 14. FORENSIC ANTHROPOLOGY](#)**
 - [The Importance of Forensic Anthropology](#)
 - [History of Forensic Anthropology](#)
 - [The Science of Bone](#)
 - [Bones and Movement](#)
 - [Bone Structure and Composition](#)
 - [Number and Development of Bones](#)
 - [Aging of Bone](#)
 - [Characteristics of Bones](#)
 - [Bones and Geography](#)
 - [How to Distinguish Males from Females](#)

- [How to Estimate Age](#)
- [How to Distinguish Ancestry](#)
- [How to Estimate Height](#)
- [Broken Bones, Diseases, Toxic Exposures, and Nutritional Status](#)
- [The Search, Collection, and Documentation of Skeletal Remains](#)
 - [Search for Skeletal Evidence](#)
 - [Documentation and Collection of Skeletal Evidence](#)
- [Analysis of Skeletal Remains](#)
 - [Preliminary Field Observations](#)
 - [Standard Procedures for Bone Analysis](#)
 - [Skeletal Analysis and Identification](#)
 - [Skeletal Trauma Analysis](#)
 - [Human or Animal Bone](#)
- [Advances in Forensic Anthropology](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. Clyde Snow](#)
- [Chapter 14. Review](#)
- [Chapter 14: Bibliography](#)
- [Activity 14-1. Determining the Age of a Skull](#)
- [Activity 14-2. Bones: Male or Female?](#)

- [Activity 14-3. Identifying the Romanovs—An Internet Activity](#)
- [Activity 14-4. Estimation of Body Size from Individual Bones](#)
- [Activity 14-5. What Bones Tell Us](#)
- [Activity 14-6. Height and Body Proportions](#)
- **[CHAPTER 15. GLASS EVIDENCE](#)**
 - [The Importance of Glass Evidence](#)
 - [The History of Glass](#)
 - [The Science of Glass](#)
 - [Production of Glass](#)
 - [Basic Glass: Soda-Lime-Silica](#)
 - [Glass Variations and Additives](#)
 - [Characteristics of Glass](#)
 - [Color](#)
 - [Thickness](#)
 - [Density](#)
 - [Refraction](#)
 - [Fracture Patterns](#)
 - [Scratches](#)
 - [Collecting and Documenting Glass Evidence](#)
 - [Crime-Scene Questions](#)
 - [Documentation of Glass Evidence](#)

- [Collection of Glass Evidence](#)
 - [Collection of Standards for Comparison](#)
- [Analysis of Glass Evidence](#)
 - [Cleaning and Preparing Glass Fragments](#)
 - [Physical, Chemical, and Microscopic Analyses](#)
 - [Bullet Fracture Evidence](#)
 - [Fracture Match](#)
- [Advances in Glass Production and Analysis](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. David Green](#)
- [Chapter 15. Review Questions](#)
- [Chapter 15: Bibliography](#)
- [Activity 15-1. Glass Fracture Pattern Analysis](#)
- [Activity 15-2. Glass Density](#)
- [Activity 15-3. Approximating the Refractive Index of Glass Using a Submersion Test](#)
- [Activity 15-4. Determining the Refractive Index of Liquids Using Snell's Law](#)
- **[CHAPTER 16. CASTS AND IMPRESSIONS](#)**
 - [Impressions as Evidence](#)

- [History of Impression Evidence](#)
- [Formation of Impression Evidence](#)
 - [Types of Impressions](#)
- [Shoe and Foot Impressions](#)
 - [Characteristics of Shoe and Foot Impressions](#)
 - [Documenting and Collecting Shoe Impression Evidence](#)
 - [Analyzing Shoe or Foot Impressions](#)
- [Tire and Tread Impressions](#)
 - [Characteristics of Tire Impression Evidence](#)
 - [Documenting and Collecting Tire Impression Evidence](#)
 - [Analysis of Tire Impression Evidence](#)
- [Dental Impressions](#)
 - [Characteristics of Dental Evidence](#)
 - [Collecting and Analyzing Dental Evidence](#)
- [Advances in Analyzing Impression Evidence](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Dr. Thomas Noguchi](#)
- [Chapter 16. Review Questions](#)
- [Chapter 16: Bibliography](#)
- [Activity 16-1. Making a Plaster of Paris Cast](#)

- [Activity 16-2. Shoe Size, Foot Size, and Height](#)
- [Activity 16-3. Tire Impressions and Analysis](#)
- [Activity 16-4. Vehicle Identification](#)
- [Activity 16-5. Dental Impressions](#)
- **[CHAPTER 17. TOOL MARKS](#)**
 - [Tool Marks as Evidence](#)
 - [History of Tool Mark Analysis](#)
 - [The Science behind Tool Mark Analysis](#)
 - [Characteristics of Tools and Tool Mark Impressions](#)
 - [Tool Surface Characteristics](#)
 - [Types of Tool Marks](#)
 - [Documenting, Collecting, and Preserving Tool Mark Evidence](#)
 - [Documenting and Photographing the Evidence](#)
 - [Collecting Tool Mark Evidence](#)
 - [Preserving Tool Mark Evidence](#)
 - [Analyzing Tool Mark Evidence](#)
 - [Tool Mark Evidence in the Courtroom](#)
 - [Advances in Tool Mark Analysis](#)
 - [Summary](#)
 - [Case Studies](#)
 - [Careers in Forensics. Dr. David P. Baldwin](#)

- [Chapter 17. Review](#)
- [Chapter 17: Bibliography](#)
- [Activity 17-1. Tool Marks: Screwdrivers and Chisels](#)
- [Activity 17-2. Hammers and Hammer Impressions](#)
- [Activity 17-3. Casting Impressions of Hammer Strikes on Wood in Silicone](#)
- **[CHAPTER 18. FIREARMS AND BALLISTICS](#)**
 - [Ballistic Evidence](#)
 - [History of Gunpowder and Firearms](#)
 - [The Science of Ballistics](#)
 - [Characteristics of Firearms and Projectiles](#)
 - [Types of Firearms](#)
 - [Firearms and Rifling](#)
 - [Bullets and Cartridges](#)
 - [Collection and Documentation of Ballistic Evidence](#)
 - [What Is Ballistic Evidence?](#)
 - [Identifying the Crime-Scene Collection Site](#)
 - [Photographing, Documenting, and Packaging Evidence](#)
 - [Analysis of Firearm and Ballistic Evidence](#)
 - [Firearm Analysis](#)
 - [Analysis of Projectiles and Cartridge Cases](#)

- [Analysis of GSR](#)
- [Analysis of Wounds from Projectiles](#)
- [Trajectory](#)
- [Advances in Ballistic Analysis](#)
- [Summary](#)
- [Case Studies](#)
- [Careers in Forensics. Gregory Klees](#)
- [Chapter 18. Review Questions](#)
- [Chapter 18: Bibliography](#)
- [Activity 18-1. Bullet Trajectory](#)
- [Activity 18-2. Firing Pin Analysis](#)
- [Activity 18-3. Describing Spent Projectiles](#)
- [Activity 18-4. How Good Is Your Aim?](#)

STUDENT LEARNING OUTCOMES (SLO): The graduating student will

(SLO 1) Content Knowledge: Students will demonstrate proficiency in the application of legal concepts, theoretical applications, scientific principles, and historical trends in the criminal justice arena.

(SLO 2) Research Skills: Students will demonstrate competency in the application of basic research methods to include: research design, statistical analysis, and uses of empirical findings and interpretations.

(SLO 3) Critical Thinking Skills: Student will demonstrate the application of organizational principles, cultural, social and behavioral knowledge, critical thinking skills and cognitive thought processes within the criminal justice arena.

Distance Education Statement: Students enrolled in distance education courses have equal access to the university's academic support services, library resources, and instructional technology support. For more information about accessing these resources, visit the SRSU

website. Students should submit online assignments through Blackboard or SRSU email, which require secure login information to verify students' identities and to protect students' information. *[If the course requires students to take proctored exams or to purchase additional software or equipment, please describe those requirements here.]* The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website.

ADA (Americans with Disabilities Act)

Sul Ross State University – Rio Grande College is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Kathy Biddick, Student Services 830-279-3003 or kbiddick@sulross.edu.