

FORENSIC SCIENCE (180 Hours)

Course No.: 78-85-60

COMPETENCY CHECKLIST

Student Name _____

Teacher Name _____ School Site _____

Start Date _____ Completion Date _____ Certificate Date _____

Teacher Signature _____ Student Signature _____

(Signatures verify completion of course competencies)

A. ORIENTATION AND SAFETY (4 hrs)

- _____ 1. Scope and purpose of the course
- _____ 2. Classroom policies and procedures
- _____ 3. Course content as part of Linked Learning
- _____ 4. Jobs in sector which impact forensics
- _____ 5. Opportunities to promote gender equity
- _____ 6. Actual job duties of forensic investigator
- _____ 7. Impact of LEED on offices and labs
- _____ 8. Impact of EPA on public service industry
- _____ 9. Proper EPA removal of hazardous materials
- _____ 10. Proper use/care of tools and equipment
- _____ 11. Proper use of electrical testing equipment
- _____ 12. Precautions in working conditions/materials
- _____ 13. MSDS as it applies to forensic investigators
- _____ 14. Purpose of Cal/OSHA and laws for scientists
- _____ 15. Handling contaminated samples
- _____ 16. Class/work first aid & emergency procedures
- _____ 17. Responsibilities to insure a safe workplace
- _____ 18. Pass safety test with 100% accuracy

B. CRITICAL THINKING SKILLS (3 hrs)

- _____ 1. Steps in defining/clarifying issues/problems
- _____ 2. Adequacy of info to justify conclusion
- _____ 3. Techniques to sharpen thinking skills
- _____ 4. Macro-cognitive tips to sharpen thinking skill
- _____ 5. Micro-cognitive tips to sharpen thinking skills

C. OBSERVATION SKILLS (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. Brain changes that occur during observation
- _____ 3. Factors that influence eyewitness accounts
- _____ 4. Good observational skills for investigator
- _____ 5. Eyewitness accounts can differ after event
- _____ 6. Factors that influence person's observation
- _____ 7. Language skills guidelines for written reports

- _____ 8. Write forensic report w/given info
- _____ 9. Pass test on observation skills

D. CRIME SCENE INVESTIGATION AND EVIDENCE COLLECTION (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. History of collecting forensic evidence
- _____ 3. Locard's exchange principle
- _____ 4. Examples of trace evidence
- _____ 5. Direct and circumstantial evidence
- _____ 6. Professionals who are present at crime scene
- _____ 7. Seven steps of a crime scene investigation
- _____ 8. Importance of securing a crime scene
- _____ 9. Methods to document a crime scene
- _____ 10. Proper collecting and packaging evidence
- _____ 11. How crime scene evidence is analyzed
- _____ 12. Language skills guidelines for written memos
- _____ 13. Write a forensic memo w/given info
- _____ 14. Pass test on crime scene evidence

E. THE STUDY OF HAIR (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. History/role of hair analysis in forensics
- _____ 3. Structure and function of hair
- _____ 4. Variations in the structure of cortex
- _____ 5. Human and nonhuman animal hair
- _____ 6. Problems involving whole number operations
- _____ 7. Calculate medullary index for a hair
- _____ 8. Distinguishing hairs from individuals/races
- _____ 9. Hair samples from a crime scene/suspect
- _____ 10. Write forensic report w/given info
- _____ 11. Pass test on study of hair

F. FIBERS AND TEXTILES (10 hrs)

- _____ 1. Define listed terms related to topic

- _____ 2. History/role of fiber analysis in forensics
- _____ 3. Characteristics of common fibers used to ID
- _____ 4. How textiles are woven
- _____ 5. Common weave patterns of textile samples
- _____ 6. Compare fibers by physical/chemical analysis
- _____ 7. Compare thread counts thru analysis
- _____ 8. Compare weave patterns thru analysis
- _____ 9. Write forensic report w/given info
- _____ 10. Pass test on fibers and textiles

G. POLLEN AND SPORE EXAMINATION (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. Distinguish between pollen and spores
- _____ 3. History/role of pollen/spore analysis
- _____ 4. Organisms that produce pollen and spores
- _____ 5. Methods of pollination in plants
- _____ 6. Pollination methods relate to crime evidence
- _____ 7. Ways that spores are dispersed
- _____ 8. Pollen/spores used for ID in forensic studies
- _____ 9. How pollen evidence collected at scene
- _____ 10. How samples are analyzed and evaluated
- _____ 11. Research crime & make an oral presentation
- _____ 12. Pass test on pollen and spore examination

H. FINGERPRINT IDENTIFICATION (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. Characteristics of fingerprints
- _____ 3. Basic types of fingerprints
- _____ 4. History/role of fingerprints in forensics
- _____ 5. How criminals attempt to alter their prints
- _____ 6. How fingerprint evidence is collected
- _____ 7. Latest fingerprint identification technologies
- _____ 8. Matching a fingerprint to one on record
- _____ 9. Write a forensic essay w/given info
- _____ 10. Pass test on fingerprint identification

I. DNA FINGERPRINTING (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. Function and structure of DNA
- _____ 3. History/role of DNA fingerprinting
- _____ 4. DNA- important in crime scene analysis
- _____ 5. How scene evidence is collected for DNA
- _____ 6. How evidence is processed for DNA
- _____ 7. Radioactive probes and DNA fingerprinting
- _____ 8. DNA evidence compared for matching
- _____ 9. DNA to identify related/unrelated individuals
- _____ 10. Write forensic report w/given info
- _____ 11. Pass test on DNA fingerprinting

J. BLOOD AND BLOOD SPATTER (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. Composition of blood

- _____ 3. Function of different blood cells
- _____ 4. History/role-blood/blood spatter in forensics
- _____ 5. Screen for human blood at crime scene
- _____ 6. Blood type from a blood sample
- _____ 7. Probability of certain blood types in population
- _____ 8. Demo a blood spatter analysis
- _____ 9. Relationship between stab wound & weapon
- _____ 10. Use blood spatter evidence to recreate events
- _____ 11. Write forensic report w/given info
- _____ 12. Pass test on blood & blood spatter

K. DRUG IDENTIFICATION AND TOXICOLOGY (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. Goals and practice of toxicology
- _____ 3. Drug ID & toxicological analysis in forensics
- _____ 4. Five types of controlled substances
- _____ 5. Signs of overdose to classes of drugs or toxins
- _____ 6. Role of various kinds of toxins in causing death
- _____ 7. Agents that may be used in bioterrorism
- _____ 8. Drug test using positive & negative controls
- _____ 9. Write forensic essay w/ given info
- _____ 10. Pass test on drug ID & toxicological analysis

L. HANDWRITING ANALYSIS, FORGERY, AND COUNTERFEITING (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. Major goals in handwriting analysis
- _____ 3. State legal basis for printing currency
- _____ 4. History/role of this analysis in forensics
- _____ 5. Types of exemplars analyzed in document
- _____ 6. Technology used in handwriting analysis
- _____ 7. Forgery vs. fraudulence
- _____ 8. Ways a business can prevent check forgery
- _____ 9. Ways a business can deter credit card fraud
- _____ 10. Features of currency to detect counterfeit
- _____ 11. Write forensic memo w/given info
- _____ 12. Pass handwriting/forgery/counterfeiting test

M. DEATH: MEANING, MANNER, MECHANISM, CAUSE, AND TIME (10 hrs)

- _____ 1. Define listed terms related to topic
- _____ 2. History/role of analysis of death in forensics
- _____ 3. Compare listed manners of death
- _____ 4. Cause, manner, mechanism of death
- _____ 5. Development of rigor, algor, & livor mortis
- _____ 6. Stages of decomposition of a corpse
- _____ 7. Types of insects found on decomposing body
- _____ 8. How listed items can estimate time of death
- _____ 9. Environment factors/estimated death time
- _____ 10. Estimate time of death using livor mortis
- _____ 11. Estimate time of death using listed data

- ___ 12. Summarize a crime report w/given info
- ___ 13. Pass test on topic

N. SOIL EXAMINATION (10 hrs)

- ___ 1. Define listed terms related to soil
- ___ 2. History/role of soil analysis in forensics
- ___ 3. Identify different soil types
- ___ 4. Demo soil analysis by given methods
- ___ 5. Soil evidence to link suspects to crime scenes
- ___ 6. Summarize a crime report w/given info
- ___ 7. Pass test on soil analysis

O. FORENSIC ANTHROPOLOGY (10 hrs)

- ___ 1. Define listed terms related to topic
- ___ 2. History/role of forensic anthropology
- ___ 3. Describe how bone is formed
- ___ 4. Compare of male/female skeletal remains
- ___ 5. Bones contain record of injury & disease
- ___ 6. Person's age determined by bone analysis
- ___ 7. Facial structure among different races
- ___ 8. Racial facial structures can prove innocence
- ___ 9. Role of mitochondrial DNA in bone ID
- ___ 10. Write sample forensic report w/given info
- ___ 11. Pass test on forensic anthropology

P. GLASS EVIDENCE (10 hrs)

- ___ 1. Define listed terms related to glass
- ___ 2. History/role of glass analysis in forensics
- ___ 3. How glass is formed
- ___ 4. Characteristics and examples of glass
- ___ 5. Calculate density of a piece of glass
- ___ 6. Refractive index of liquids using Snell's Law
- ___ 7. Use refractive index to identify types of glass
- ___ 8. Write report to link glass to suspect/crime
- ___ 9. Describe how glass fractures
- ___ 10. Fracture patterns/find how glass was broken
- ___ 11. Determine if suspect was/wasn't at scene
- ___ 12. Write sample forensic report w/given info
- ___ 13. Pass test on glass analysis

Q. CASTS AND IMPRESSIONS (10 hrs)

- ___ 1. Define listed terms related to topic
- ___ 2. History/role of casts & impressions analysis
- ___ 3. Types of impressions
- ___ 4. How impressions are used as trace evidence
- ___ 5. Foot/shoe/tire impressions
- ___ 6. Track width/wheelbase to identify vehicles
- ___ 7. How to prepare dental impressions
- ___ 8. Dental impressions w/bite marks on a victim
- ___ 9. Oral summary of case w/given info
- ___ 10. Pass test on casts and impressions

R. TOOL MARKS (10 hrs)

- ___ 1. Define listed types of marks/impressions
- ___ 2. History/role of tool mark analysis in forensics
- ___ 3. Major types of tool mark impressions
- ___ 4. Variations in tool surfaces in identifying tools
- ___ 5. Evidence: collected/preserved/documentated
- ___ 6. Write sample forensic report w/given info
- ___ 7. Pass test on tool marks

S. BALLISTICS (10 hrs)

- ___ 1. Identify listed terms related to ballistics
- ___ 2. History/role of ballistics analysis in forensics
- ___ 3. Differences in listed handguns/rifle/shotgun
- ___ 4. Bullet vs. a cartridge
- ___ 5. Rifling & the flight of the projectile
- ___ 6. Barrel size & caliber relationship
- ___ 7. Explain how bullets are test fired & matched
- ___ 8. Ballistics recovery & exam at crime scene
- ___ 9. Effect of gravity on bullet trajectory
- ___ 10. Position of shooter based on trajectory
- ___ 11. Effect of bullet wounds on the body
- ___ 12. Write a sample forensics report w/given info
- ___ 13. Pass test on ballistics

T. EMPLOYABILITY SKILLS (3 hrs)

- ___ 1. Employer requirements in employees
- ___ 2. Identify potential employers
- ___ 3. Role of electronic social networking in search
- ___ 4. Design sample resumes
- ___ 5. Importance of job application
- ___ 6. Complete sample job applications correctly
- ___ 7. Importance of enthusiasm on a job
- ___ 8. Appropriate appearance on a job
- ___ 9. Continuous upgrading of job skills
- ___ 10. Info/materials for successful interview
- ___ 11. Demo appropriate interviewing techniques