Trainee Name:

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| **Training Area** | Date Completed/  Trainee’s Initials | Trainer’s  Initials |
| **1. Safety** |  |  |
| Chemical Hazards/MSDS Sheets |  |  |
| Electrical Safety |  |  |
| Blood borne Pathogen training |  |  |
| Read and understand the North Carolina State Crime  Laboratory Safety Manual |  |  |
| Read and understand the DOJ Safety Manual |  |  |
| **2. Ethics** |  |  |
| Lecture |  |  |
| Read and understand NCSCL Policy on Ethics and Conduct |  |  |
| Read and understand “ASCLD/LAB guiding Principles of  Professional Responsibility for Crime Laboratories and  Forensic Scientists”, Appendix C from NCSCL Quality Manual |  |  |
| Read and understand the American Board of Criminalistics  (ABC) Rules of Professional Conduct |  |  |
| **3. Evidence Handling/Workflow** |  |  |
| Evidence Handling Lecture |  |  |
| Workflow Lecture |  |  |
| Read North Carolina State Crime Laboratory Evidence Guide |  |  |
| Read and understand State Crime Laboratory Procedure for  Evidence Management |  |  |
| Read and understand Forensic Biology Section Procedure for  Evidence Handling |  |  |
| Demonstration of Identifying and Packaging Evidence |  |  |
| Supervised Identification and Packaging of Evidence |  |  |
| Workflow case scenarios |  |  |
| **4. Aseptic Technique and Contamination Control** |  |  |
| Read and understand Aseptic Technique and Contamination  Control procedure |  |  |
| Aseptic technique/cleaning of equipment |  |  |
| Aseptic technique for handling evidence samples |  |  |
| 1. **Screening and Evidence Collection** |  |  |
| Demonstration on how to collect evidence |  |  |
| Properly collect evidence from 15 samples |  |  |
| Read and understand the Procedure for ALS |  |  |
| Demonstration use of the ALS |  |  |
| Identify areas that should be tested further  using ALS |  |  |
| **6. Quality Assurance/Quality Control** |  |  |
| Read and understand Laboratory Quality Assurance Manual |  |  |
| Lecture on SWGDAM, Audits |  |  |
| Lecture on Forensic Biology Quality Control |  |  |
| Equipment Calibrations:  - Read and understand Forensic Biology Section Procedures  for Calibration and Equipment Maintenance  - Read and understand Forensic Biology Section Procedures for Quality Control and Reagent Preparation |  |  |
| Assigned Readings:  - FBI Quality Assurance Standards for DNA Testing  Laboratories  - SWGDAM Validation Guidelines for DNA Analysis  Methods |  |  |
| Understand how to prepare and QC check reagents |  |  |

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| **Blood Analysis** |  |  |
| **1. Historical Body Fluid Testing and**  **Bloodstain Pattern Awareness** |  |  |
| Lecture |  |  |
| Readings |  |  |
| Successfully pass a quiz on Historical body Fluid Testing and Bloodstain Pattern Awareness |  |  |
| 1. **Blood Identification** |  |  |
| Lecture |  |  |
| Readings |  |  |
| Kastle-Meyer Test |  |  |
| Read and understand procedure |  |  |
| Demonstration of test |  |  |
| Practical exercises from worksheet |  |  |
| RSID Blood Test |  |  |
| Read and understand procedure |  |  |
| Demonstration of test |  |  |
| Examine 10 samples |  |  |
| Successfully pass a quiz on blood Identification |  |  |
| **3. Notes and Report Writing** |  |  |
| Understand how to use FA |  |  |
| Demonstrate how to use serology workbook |  |  |
| Mock Cases |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| Able to draft a satisfactory report from  previously analyzed cases |  |  |
| **4. Competency Testing** |  |  |
| Successful completion of competency practical  test |  |  |
| Successful completion of final written test |  |  |
| Successful completion of oral board |  |  |
| Successful completion of final mock case |  |  |

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| **Semen Analysis** |  |  |
| 1. **Semen and Sperm Identification** |  |  |
| Lecture |  |  |
| Read and understand Procedure for Semen and Sperm analysis |  |  |
| Readings |  |  |
| Acid Phosphatase Test |  |  |
| Demonstration of test |  |  |
| Practical exercises from Semen Worksheet |  |  |
| Microscopic Examination |  |  |
| Lecture |  |  |
| Read and understand procedure |  |  |
| Demonstration of staining procedure and microscope use |  |  |
| View various slides made from sample taken from the Semen Worksheet |  |  |
| Viewing of animal slides |  |  |
| Quantitation of >20 previously prepared slides |  |  |
| RSID Semen Test |  |  |
| Read and understand procedure |  |  |
| Demonstration of test |  |  |
| Examine samples from the Semen  Worksheet |  |  |
| Successfully pass a quiz on Semen Identification |  |  |
| **2. Notes and Report Writing** |  |  |
| Understand how to use FA |  |  |
| Demonstrate how to use serology worksheets |  |  |
| Mock Cases |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| FA case number: |  |  |
| Able to draft a satisfactory report from  previously analyzed cases |  |  |
| **3. Competency Testing** |  |  |
| Successful completion of competency practical  test |  |  |
| Successful completion of final written test |  |  |
| Successful completion of oral board |  |  |
| Successful completion of final mock case |  |  |

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| **DNA Analysis Training** |  |  |
| **1. Extraction** |  |  |
| Lecture |  |  |
| Read and understand procedure |  |  |
| Demonstration of EZ1 robotic extractions |  |  |
| Supervised EZ1 robotic extractions |  |  |
| Demonstration of Differential Extractions |  |  |
| Supervised Differential Extractions |  |  |
| Optional: Demonstration of Concentration of Extracted DNA |  |  |
| Optional: Demonstration of Bone or Teeth Extraction |  |  |
| Optional: Supervised Bone or Teeth Extractions |  |  |
| Assigned Readings:  - Fundamentals of Forensic DNA Typing, Chapter 1, 2, 3, 4,  5, 14  - Advanced Topics in Forensic DNA Typing: Methodology, Chapter 1, 2, 10, 11  - Kishore, R. et al. 2006. **Optimization of DNA Extraction from Low-Yield and Degraded Samples Using the BioRobot EZ1 and BioRobot M48**, J Forensic Sci, 51 (5).  - EZ1 DNA Investigator Handbook  - Qiagen EZ1 advanced XL User Manual  - Qiagen EZ1 Internal Validations |  |  |
| Extraction of all training samples |  |  |
| **2. Quantitation** |  |  |
| Lecture |  |  |
| Read and Understand procedure |  |  |
| Demonstration of RT PCR Set-up Procedure(Manual) |  |  |
| Demonstration of RT-PCR Set-up Procedure (QIAgility) and  Interpretation |  |  |
| Completion of manual setup of Quantifiler Trio standard curve |  |  |
| Supervised RT PCR Setup (Manual) and Interpretation |  |  |
| Supervised RT PCR Setup (QIAgility) and Interpretation |  |  |
| Assigned Readings:  - Fundamentals of Forensic DNA Typing, Chapter 6  - Advanced Topics in Forensic DNA Typing: Methodology, Chapter 3  - Holt, A. et al. 2016. **Developmental validation of the Quantifiler HP and Trio Kits for human DNA quantitation in forensic samples.** Forensic Science International:Genetics, 21 (2016) 145-157.  - Internal Validation of Quantifiler Trio DNA Quantification  Kit |  |  |
| - QIAgility User Manual  - QIAgility Internal Validation Study |  |  |
| Quantitation of all training Samples |  |  |
| **3. STR/PCR Amplification** |  |  |
| Lecture |  |  |
| Read and Understand Procedure for PCR Amplification F6C |  |  |
| Demonstration of Amplification setup (Manual) |  |  |
| Demonstration of Amplification setup (QIAgility) |  |  |
| Supervised Amplification setup (Manual) |  |  |
| Supervised Amplification setup (QIAgility) |  |  |
| Assigned Readings:  - Fundamentals of Forensic DNA Typing, Chapter 7, 8, 14,  15, 16  - Advanced Topics in Forensic DNA Typing: Methodology, Chapter 4, 5, 11, 12, 13, 14, 16  - Ensenberger, M. et al. 2016. **Developmental Validation of the PowerPlex Fusion 6C System.** FSI: Genetics, 21 (134-  144)  - Fujii, K. et al. 2016. **D5S818 Typing Discrepancy Between PowerPlex Fusion and Other STR Kits Including GlobalFiler Caused by a One-base Deletion in**  **31 Nucleotides Upstream of the Repeat Region**. J.  Forensic Sci, 61 (3).  - Internal Validation of Promega Fusion 6C PCR Amplification Kit |  |  |
| Amplification of training samples |  |  |
| **4. Electrophoresis** |  |  |
| Lecture |  |  |
| Read and understand procedure |  |  |
| Demonstration of 3500 series Plate-Setup (Manual) and  electrophoresis run |  |  |
| Demonstration of 3500 series Plate-Setup (QIAgility) |  |  |
| Supervised 3500 series Plate Set-Up (Manual) and electrophoresis run |  |  |
| Supervised 3500 series Plate Set-Up (QIAgility) |  |  |
| Assigned Readings:  - Fundamentals of Forensic DNA Typing, Chapter 9, 10  - Advanced Topics in Forensic DNA Typing: Methodology, Chapter 6  - Advanced Topics in Forensic DNA Typing: Interpretation, Chapter 2, 8  - “Analytical Thresholds and Sensitivity: Establishing RFU Thresholds for Forensic DNA Analysis”, JFS, January  2013, vol 58, no 1  - **Consideration for evaluating carryover on AB Capillary Electrophoresis Platforms in a HID laboratory**, AB Technical Note, June 2012  - Bregu, J. et al. 2013**. Analytical Thresholds and Sensitivty: Establishing RFU Thresholds for Forensic DNA Analysis.** J Forensic Sci, 58 (1)  - Gill, P. eta l. 2009. **The low-template-DNA (stochastic) threshold – its determination relative to risk analysis for national DNA databases.** FSI: Genetics, 3: 104-111.  - Moretty, T.R. et al. 2001. **Validation of STR Typing by**  **Capillary**. J. Forensic Sci, 46 (3).  - Moretty, T.R. et al. 2001. **Validation of Short Tandem Repeats (STRs) for Forensic Usage: Performance Testing of Fluorescent Multiplex STR Systems and Analysis of Authentic and Simulated Forensic Samples**. J. Forensic Sci, 46 (3).  - Taylor, D. et al. 2016. **Validating multiplexes for use in conjunction with modern interpretation strategies.** Forensic Science International: Genetics, 20: 6-19.  - 3500 Series Data Collection Software, User Bulletin.  Applied Biosystems. |  |  |
| Electrophoresis of all training samples |  |  |
| **5. Interpretation and Statistics** |  |  |
| Lecture – Interpretation and ArmedXpert |  |  |
| Lecture – Mixture Interpretation |  |  |
| Hand Calculation – Mixture Interpretation |  |  |
| Lecture – Statistics |  |  |
| Hand Calculation – RMP |  |  |
| Read and Understand Analysis and Interpretation F6C  Procedure |  |  |
| Read and Understand Procedure for ArmedXpert |  |  |
| Demonstration of Genemapper ID-X Software |  |  |
| Supervised Application of Genemapper ID-X Software |  |  |
| Demonstration of Excel Tables using Genemapper ID-X |  |  |
| Supervised Application of Excel Tables using Genemapper ID-  X |  |  |
| Demonstration of ArmedXpert Software |  |  |
| Supervised Application of ArmedXpert Software |  |  |
| Analysis and Interpretation of Samples provided by DNA  Technical Leader |  |  |
| Assigned Readings: Interpretation  - SWGDAM Interpretation Guidelines for Autosomal STR  Typing (2010)  - Fundamentals of Forensic DNA Typing, Chapter 10, 18  - Advanced Topics in Forensic DNA Typing: Methodology, Chapter 17  - Advanced Topics in Forensic DNA Typing: Interpretation, Chapters 1, 3, 4, 5, 6  - Bright, et al. 2013. **Degradation of forensic DNA profiles.**  Australian Journal of Forensic Sciences.  - Balding, D. and J. Buckleton. 2009. **Interpreting low template DNA profiles**. FSI: Genetics, 4: 1-10.  - “Analysis and Interpretation of mixed forensic stains using  DNA STR profiling”, FSI 1998; 55-70  - “Obervation of tri-allelic patterns in autosomal STRs during routine casework”, FSI Genetics, 2009, 38-40  - Roffey, P.E., et al. 2000. **A Rare Mutation in the Amelogenin Gene and Its Potential Investigative Ramifications.** J. Forensic Sci, 45 (5).  - Shewale, J.G., et al. 2000. **Anomalous Amplification of**  **the Amelogenin Locus Typed by the AmpFℓSTR® Profiler Plus® Amplification Kit.** Forensic Science Communications, 2 (4).  - Rubocki, R.J., et al. **Natural DNA Mixtures Generated in**  **Fraternal Twins *in uter.*** J Forensic Sci, 46 (1): 120-125  - Gill, P., et al. 2006. **DNA Commission of the International Society of Forensic Genetics: Recommendations on the interpretation of mixtures.** Forensic Science International, 160 (2006) 90-101.  - Gill, P. et al. 2012. **DNA Commission of the International Society of Forensic Genetics: Recommendations on the evaluation of STR typing results that may include drop-out and/or drop-in using Probabilistic Methods.** Forensic Science International: Genetics 6 (2012) 679-688. |  |  |
| Assigned Readings – Statistics  - Fundamental of Forensic DNA Typing, Chapter 11,  Appendix 3  - Advanced Topics in Forensic DNA Typing: |  |  |
| Interpretation, Chapters 9, 11, 12  - **The Evaluation of Forensic DNA Evidence**, National Research Council, National Academy Press, 1996 (NRCII)  - **Source Attribution of a Forensic DNA Profile**, Forensic Science Communications, July 2000, vol 2, no  3  - Chakraborty, R. 1992. **Establishing the Robustness of Short Tandem Repeat Statistics for Forensic Applications**. Human Biology, 64(2): 141-159.  - NIST database reference, FSI: Genetics, 7 (2013) e82 –  e83. |  |  |
| **6. CODIS Operations** |  |  |
| CODIS Lecture |  |  |
| Demonstration of Use of Specimen Manager |  |  |
| Demonstration of Sample Uploading |  |  |
| Demonstration of Calculation of Frequencies using POPSTATS |  |  |
| Demonstration of Printing Frequency Report |  |  |
| Demonstration of Use of the Match Estimator |  |  |
| Assigned Readings:  - Fundamentals of Forensic DNA Typing, Chapter 12  - Advanced Topics in Forensic DNA Typing: Methodology, Chapter 8, 9, Appendix 2 |  |  |
| **7. Notes, Report Writing, and Reviews** |  |  |
| Demonstration of use of FA worksheets and DNA workbook |  |  |
| Assigned Readings:  - Butler Book, Appendix VII  - Forensic Biology Procedure for Casework Report Writing |  |  |
| **8. YSTR Analysis - optional** |  |  |
| Lecture |  |  |
| Read and understand procedures |  |  |
| Demonstration of YSTR amplification and CE Setup |  |  |
| Supervised amplification and CE setup |  |  |
| Amplify and CE assigned samples |  |  |
| Interpret assigned samples |  |  |
| Perform statistics and write reports |  |  |
| **9. Training Samples** |  |  |
| FA Case Number: | | |
| Completion and Review of Known Blood Samples |  |  |
| Completion and Review of Known Saliva/Buccal Samples |  |  |
| Completion and Review of Unknown Blood Samples |  |  |
| Completion and Review of Differential Samples |  |  |
| Completion and Review of Cigarette Butt Samples |  |  |
| Completion and Review of “Touch”/Epithelial Samples |  |  |
| Completion and Review of Hair Root Samples |  |  |
| Optional: Completion and Review of Bone or Teeth Samples |  |  |
| Optional: Completion and Review of YSTR Samples |  |  |
| **10. Competency Testing** |  |  |
| Successful Completion of Competency Test 1  FA Case Number: |  |  |
| Successful Completion of Competency Test 2  FA Case Number: |  |  |
| Successful Completion of Competency Test 3  FA Case Number: |  |  |
| Successful Completion of Written Test | Score: |  |
| Successful Completion of Oral Board |  |  |
| **11. Written Examinations** |  |  |
| Extraction Quiz | Score: |  |
| Quantitation Quiz | Score: |  |
| Amplification Quiz | Score: |  |
| CE Quiz | Score: |  |
| Interpretation and Statistics Quiz | Score: |  |
| YSTR Quiz | Score: |  |
| **12. Courtroom Testimony** |  |  |
| Lecture |  |  |
| Read Assigned Courtroom Transcripts |  |  |
| Assigned Readings:  - **Advanced Topics in Forensic DNA Typing: Methodology**, Chapter 18, Appendix 4  - *N.C. vs Ragland*  - *Crawford v Washington* (2004)  - *Melendez-Diaz v. Massachusetts* (2009) |  |  |
| Observed Courtroom Testimony (at least 3 required)  (Date, Type of Case)  1  2  3  4  5 |  |  |
| Practice Moot Court  1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  |
| Successful Completion of Moot Court  FA Case Number: |  |  |

This Forensic Scientist is approved for independent casework analysis in the following training area(s).

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| **Analysis Type** | **Technical Leader Signature** | **Date** |
| Blood Analysis |  |  |
| Semen Analysis |  |  |
| STR DNA Analysis |  |  |
| YSTR DNA Analysis |  |  |