**Welcome to Forensic Science!**

I am very excited for the year ahead of us. We are going to explore many interesting topics together and I hope that you walk away from my class having had a positive experience. Additionally, I hope that you apply the information you learn in my class to your everyday lives and appreciate the importance of learning about the natural world around you.

* Mr. Rivers

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Teacher: Mr. Rivers

Room #: C202

Subject: Forensic Science – full year

Email: [JRivers@barnegatschools.com](mailto:JRivers@barnegatschools.com)

Textbook: Forensic Science Fundamentals & Investigations. 2016.

Google Classroom code:

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**Course Description**

This course focuses on the collection, identification and analysis of crime scene evidence. Emphasis will be placed on the methods that link suspect, victim, and crime scene. Laboratory exercises will include finger printing, handwriting analysis, ballistics, blood typing, hair and fiber examination, and DNA analysis. Case studies and current events will be explored.

**Course Objectives**

**Unit 1: History**

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| Define forensic science and list the major disciplines it encompasses. |
| Identify the major contributors to the development of forensic science and explain how scientific advancements account for the rapid growth of forensic laboratories in the past 40 years. |
| Describe Locard’s Exchange principle. |
| Compare and contrast Frye and Daubert decisions relating the admissibility of scientific evidence in the courtroom and explain the role and responsibilities of the expert witness. |
| Analyze how scientific advancements have contributed to the more effective use of forensic science in solving crimes |

**Unit 2: Physical Evidence**

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| Identify the common types of physical evidence encountered at crime scenes and describe proper techniques for packaging common types of physical evidence. |
| Explain the difference between the identification and comparison of physical evidence. |
| Define and contrast individual and class characteristics of physical evidence. |
| Assess the value of class characteristics to crime scene investigation. |

**Unit 3: The Crime Scene**

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| Define the crime scene and identify the steps followed in crime scene investigation. |
| Describe the use and information obtained from physical evidence found at the crime scene. |
| Demonstrate proper documentation of the crime scene, various techniques used to effectively search a crime scene and   proper techniques used to collect, package, and preserve physical evidence at a crime scene. |
| Summarize and present crime scene reports including sketches, photographs, notes and lab analysis results |

**Unit 4: Fingerprinting**

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| Analyze the common ridge characteristics of a fingerprint. |
| Identify and compare the three major fingerprint patterns and their respective subclasses. |
| Distinguish between visible, plastic and latent fingerprints |
| Describe the concept of an automated fingerprint identification system (AFIS) and its importance to forensic investigation. |
| List and demonstrate the techniques for developing latent fingerprints on porous and nonporous objects. |
| Describe and demonstrate the proper procedures for preserving a developed latent fingerprint. |

**Unit 5: Blood Evidence**

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| Explain the composition of blood |
| Describe the function of blood cells |
| Describe the history of the use of blood and blood-spatter analysis in forensic science |
| Describe how to determine blood type, given a sample |
| Describe how to screen for the presence of human blood |
| Calculate the probability of certain blood types with in a population |
| Conduct a blood spatter analysis |
| Use blood spatter evidence to recreate the events of a crime scene |

**Unit 6: DNA**

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| Identify the parts of a nucleotide and explain how nucleotides are linked to form DNA and explain the concept of base pairing as it relates to the double-helix structure of DNA. |
| Describe how the newest DNA typing techniques, like short tandem repeats (STRs) and  polymerase chain reaction (PCR) are applied to forensic DNA typing and how CODIS is used to compare DNA samples |
| Describe the difference between nuclear and mitochondrial DNA. |
| List the necessary procedures for proper preservation of biological evidence for laboratory DNA analysis. |

**Unit 7: Questioned Documents**

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| Define questioned document, explain some of the techniques document examiners use to uncover alterations, erasures, obliterations, and variations in pen inks |
| Identify what common characteristics are associated with handwriting and list important guidelines for collecting known writings for comparison to a questioned document. |
| Describe Anti-counterfeiting features on US currency |

**Unit 8: Toxicology**

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| Identify unknown substances by [utilizing](http://www.nextgenscience.org/sites/ngss/files/How%20to%20Read%20NGSS%20-%20Final%2008.19.13.pdf) a series of chemical tests of the chemical and physical properties of substances |
| Explain what LD50 is and how it is determined and use it to classify how toxic a substance is |
| Human metabolism of alcohol and calculation of blood alcohol content |

**Unit 9: Anthropology**

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| Describe how bone is formed |
| Distinguish between male/female skeletal remains based on skull, jaw, brow ridge, pelvis and femur |
| Describe how bones contain a record of disease and injury |
| Describe how age determination may be based upon an analysis of bone |
| Explain human facial structure differences based upon race |
| Describe the role of mitochondrial DNA in bone identification |

**Unit 10: Autopsies and Entomology**

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| Distinguish between four manners of death: natural, accidental, suicidal, homicidal |
| Distinguish between cause, manner, and mechanisms of death |
| Explain how the development of rigor, algor and livor mortis occur |
| Employ evidence of rigor, algor and livor mortis to calculate the approximate time of death |
| Describe the stages of decomposition in a corpse |
| Employ autopsy report regarding stomach contents to estimate time of death |
| Explain how time of death estimates may be linked to insect evidence |
| Provide an example of the succession of different types of insects that are found on a body as it decomposes |
| Estimate time of death given insect evidence, rigor, algor and livor mortis data |
| Describe how various environmental factors may influence the estimated time of death |

**Unit 11: Hair and Fiber Analysis**

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| Identify the various parts of hair |
| Describe variations in the structure of the medulla, cortex, and cuticle |
| Distinguish between human and nonhuman animal hair |
| Explain how hair can be used in a forensic investigation. |
| Calculate the medullary index for a hair. |
| Distinguish hairs from individuals belonging to the broad racial categories |
| Determine if two examples of hair are likely to be from the same person. |
| Identify and describe common weave patterns of textile samples |
| Compare and contrast various types of fibers through physical and chemical analysis. |
| Describe principal characteristics of common fibers used in their identification. |

**Unit 12: Ballistics and Impression Evidence**

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| Distinguish between latent, patent, and plastic impressions |
| Explain how various types of impressions can be used as trace evidence |
| Use track width and wheelbase information to identify a motor vehicle |
| Discuss the significance of tool mark impressions in criminal investigations |
| Describe three major types of tool mark impressions |
| Describe variations in tool surface characteristics that are used to identify individual tools |
| Match tool marks with the instrument used to create same |
| Describe how tool mark evidence is collected, preserved and documented |
| Describe rifling on a gun barrel and explain how it marks a bullet |
| Explain barrel size and caliber |
| Describe how bullets are test fired and matched |
| Discuss the role of ballistics recovery and examination at a crime scene |
| Determine the position of the shooter based on bullet trajectory |

**Academic Honesty**

The Barnegat Township School District places a strong emphasis on students’ integrity, and the district will not tolerate instances of academic dishonesty.  Plagiarism is the practice of copying words, sentences, images, or ideas for use in written or oral assessments without giving proper credit to the source. Cheating is defined as the giving or receiving of illegal help on anything that has been determined by the teacher to be an individual effort.  Both are considered serious offenses and are subject to consequences described in the Student Handbook and Board Policy #5701.

**Classroom Rules**

1. All school rules apply in my classroom.
2. Be prepared and on time.
3. Respect others.
4. Follow directions.
5. Keep the phones away, I’ll let you know when you can use them!
6. Focus and take care of what needs to be taken care of!

**Consequences**

Student discipline will follow these progressive steps:

1st offense: verbal warning

2nd offense: contact home

3rd offense: referral to office

**Class Participation Rubric**

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| **Meets or Exceeds**  **Expectations**  **100 - 93** | The student:   * ensures that the class is a community of respect; * consistently arrives prepared for class; * voluntarily participates on a consistent basis; * consistently remains focused and on task; * initiates and sustains discussion; * evaluates and responds to peer points; * consistently demonstrates leadership in collaborative activities. |
| **Approaches Expectations**  **92 - 85** | * recognizes the class as a community of respect; * usually arrives prepared for class; * willingly participates on a regular basis; * remains focused and on-task on a regular basis; * contributes to discussion on a regular basis; * listens to and responds to peer points; * contributes to collaborative activities on a consistent basis. |
| **Does Not Meet Expectations**  **84 - 70** | * fails to recognize the class as a community of respect; * frequently arrives unprepared for class; * rarely participates, even when called upon; * lacks focus and rarely remains on task; * rarely engages in discussion; * reacts to peer points rather than responds; * rarely engages in collaborative activities. |

FAQ’s

**What will I learn in Forensic Science?**

This course will cover topics such as entomology, anthropology, toxicology, serology and blood splatter, DNA, fingerprinting, ballistics, trace evidence and impressions, and the criminal mind.

**What should I bring to class?**

3-ringed Binder, pocket folder, notebook/paper, and a pen or pencil to write with.

Textbooks will be stored and used in the classroom.

**How will I be graded?**

# 50% Major Assessments

30% Minor Assessments

20% Class Participation

\*\*Please note: the above areas are used as the basis for 80% of your grade for the course; the midterm and/or final exam will constitute the remaining 20% of your grade.\*\*

Major Assessments are summative in nature, therefore provide judgement on a student’s performance at the end of a required unit or activity. Major assessments may include the following:

* Tests
* Projects
* Essays or written reports
* Research papers
* Class presentations

Minor Assessments are formative in nature, therefore are ongoing and provide the teacher and student with feedback on the student’s progress in a particular area. Minor assessments may include the following:

* Quizzes
* In class worksheets or practice problems
* Do Nows or Exit Tickets
* Summary lab activity questions (handed in after a lab experiment)
* Short summary writings (3-4 sentences)
* Lab participation/completion
* Diagnostic tests
* Teacher observations

Homework

100% - Homework completed

75% - Homework attempted and at least 50% correct

50% - Homework attempted but less than 50% correct

0% - No attempt or not handed in

Class Participation grades will be assigned twice per marking period; once at the interim and once at the end of the marking period.

\*As per department policy, there is no extra credit.

**Can I hand in homework late?**

Yes, but for each day the assignment is late, the student will lose 25% off their maximum possible grade for the assignment.

IT IS THE STUDENT’S RESPONSIBILITY TO OBTAIN AND FINISH ALL MISSED ASSIGNMENTS. **IF YOU ARE ABSENT, SEE ME WHEN YOU RETURN**.

**Can I retake/re-do quizzes and tests?**

Yes, should a student wish to improve their test/quiz score they must meet with the teacher at a mutually convenient time for remediation. After remediation the student will be able to redo the questions they got wrong and receive 50% of the points back for each correct answer.

**What happens if I am late to class?**

Regular and prompt class attendance is an essential part of the educational experience. The Barnegat Township School District expects students to be responsible and exercise good judgment regarding attendance and absences.  Students accept full responsibility for ensuring that they complete any/all work missed due to absences. If you are late to class (unexcused) 3 times you will receive a detention and a CUT. *Three cuts and a student will receive credit withdrawal.*

**How can I get extra help?**

Occasionally, students will require additional help to master the content and skills in this course.  If you need additional help, there are a variety of options for you, including:

* Before/after school help sessions with your teacher
* Peer tutoring from NHS / NJHS students
* Free online tutoring with Brainfuse (available from the Barnegat Library website)

As your teacher, I am committed to your success.   If you need help, please ask!

I have read and understand the syllabus for Mr. Rivers’ Forensic Science course.

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Student Signature Print Name

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Parent/Guardian Signature Print Name