

FSC 642 DNA Technical Assistance Program
2 credit hours
Fall 2018

COURSE SYLLABUS

Course Instructor:

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Course Description:

The goal of the DNA Technical Assistance Program (DNA TAP) is to prepare select students for placement in host forensic laboratories for validation studies. Although the TAP placement of all students enrolled in this course cannot be guaranteed, the course administrators will work diligently with each student to ensure that they are placed as Technical Assistants or in another DNA Internship. During this course, the student will undergo preparatory lectures and hands-on instrument training. In addition, participants will undergo troubleshooting activities as well as validation plans in preparation to choose placement assignments. The general instruction scheme is to introduce all students to extraction, quantitation, amplification and capillary electrophoresis applications. Additionally, students will participate in introductory laboratory activities. This course is unlike any other course offered at the MUFSC and because of this, introductory information will be presented at an accelerated pace with schedule adjustments occurring at short notice. Participating students are expected to anticipate the unexpected and work with instructors to achieve the goals of the course.

Office Hours

There are no set office hours contact the instructor using the information above to schedule time.

Recommended Textbooks

The following titles are not required texts for this course but rather recommended for additional information pertaining to the covered material. Lectures and laboratory demonstrations will be accompanied by provided handouts.

Title	An Introduction to Forensic Genetics
Author(s)	William Goodwin, Adrian Linacre, Sibte Hadi
Publisher	John Wiley & Sons, Limited
Edition	First Edition
ISBN	978-0-470-01025-9

Title	Fundamentals of Forensic DNA Typing
Author(s)	John M. Butler
Publisher	Elsevier

Edition	Second Edition
ISBN	978-0-12-374999-4

Prerequisite

None

Course Objectives:

1. To accelerate the understanding and familiarity of forensic DNA technologies through intensive lectures and demonstrations that may include:
 - DNA extraction methods (*Organic, DNA IQ, Qiagen and Robotic*)
 - DNA quantification methods (*AB7500 and Real-time PCR*)
 - DNA PCR-based amplification methods (*STR and YSTR*)
 - Capillary Electrophoresis Technologies (*AB 310, 3100, 3130xl, and 3500xl*)
 - Data analysis methods (*GeneMapper ID and GeneMapper ID-X*)
 - Validation procedures
 - Quality control and quality assurance
2. To gain practical skills through demonstrations of the above technologies. Because the laboratory activities will most likely be required to perform necessary validation studies in host laboratories, students will be prepared to train in the spring semester for various validation projects.

Class Time and Location

The primary schedule for this course is 4:00 - 6:00 PM on Thursdays in the West Wing Classroom I in the Forensic Science Center (MUFSC) as well as the Laboratory in the Annex Building.

Date	Topics and Activities
August 23	An Introduction to Forensic DNA Analysis, FBI QAS Overview, and Validation
August 30	Nucleic Acid Extraction
September 6	Laboratory Demonstration: Pipetting
September 13	Laboratory Demonstration: Qiagen EZ1 Investigator Extraction
September 20	Real-Time PCR Quantitation
September 27	Laboratory Demonstration: Applied Biosystems Quantifiler Trio Real-Time PCR Quantitation
October 4	Laboratory Demonstration: Quantitation results interpretation Examination preparation
October 11	Examination 1 (Intro through Quantitation, including QAS and Validation)
October 18	PCR Amplification
October 25	Laboratory Demonstration: Concentrations, Dilutions and Promega Fusion Amplification
November 1	Capillary Electrophoresis
November 8	Laboratory Demonstration: Applied Biosystems 3130 Genetic Analyzer Run Setup and Instrument Maintenance
November 15	Capillary Electrophoresis Artifact Identification and GeneMapper ID Software Setup; GeneMapper ID/ID-X Software Algorithms
November 22	Thanksgiving (no class)
November 29	Laboratory Demonstration: GeneMapper ID-X Data Analysis
December 6	Review
December 13	Examination 2 (Amplification through Data Analysis, including QAS and Validation)

A. Attendance & Absence Procedures

Attendance is MANDATORY. Students enrolled in the Forensic Science Program are expected to attend all classes, laboratories, seminars, internship sessions, and presentations offered by guest speakers.

Student Absence Form: www.marshall.edu/forensics <Student Only> <Forms> or on the last page of this syllabus. Completion of an Instructor-signed Student Absence Form is facilitated by the Student and sent on to the Program Coordinator for all absences. This may occur BEFORE the absence (recommended) or on the first day of class upon return. Whether the absence is EXCUSED or UNEXCUSED will dictate whether the student will be granted make-ups and whether they will receive point or grade reductions. Completed Absence Forms will be placed in the student's formal file. A Completed Absence Form is one bearing signatures of the student, instructor(s), and program coordinator. If the student is not able to attend class for any reason, a phone call or e-mail to the Instructor is required BEFORE class time as this is a standard employer practice.

Excused Absences: The Program Coordinator and Instructor must be notified of absences. Formal documentation is required for Excused Absences which may involve physician statements excusing the student from class, obituaries, or professional travel documentation. With an Excused Absence, the student may be asked to take an exam BEFORE the scheduled date. No exams, labs, or other formal exercises will be made up without an Excused Absence. Examples of Excused Absences include

- Personal Medical Emergency – Formal documentation is required from a licensed physician or appropriate healthcare provider
- Death in the Immediate Family – Documentation required
- Forensic Professional Travel – Documentation required. Marshall University Forensic Science Program, Marshall University, the West Virginia Policy Board for Higher Education are not liable for accidents or injuries incurred during trips within or out of the state.

Unexcused Absences: Any unexcused absence in which a student misses a lab or exam or other graded activity will result in the deduction of one letter grade from the student's final grade or a reduction of points as specified in the Course Syllabus. Any quizzes missed during an unexcused absence will result in a zero.

Medical Withdrawal: <http://www.marshall.edu/wpmu/student-affairs/files/2011/08/Medical-Withdrawal-Policy.pdf>.

Final Grade Appeal: Any student who believes the final course grade is wrong may appeal the grade. See (<http://www.marshall.edu/graduate/graduate-student-appeals/>). The appeal is limited to three areas:

a) The final grade assigned for a course is based on an obvious error (e.g. a clear error such as error in computing a grade or failure to grade one of the answers on an exam). b) Standards different from those established in written department, or Graduate College policies, if specific policies exist, were used in assigning the grade. c) The instructor departed from his or her previously articulated, written standards, without notifying graduate students, in determining the grade. There are several steps in the appeal process. These are designed to allow the student, faculty, and program director to correct the error or come to a mutual compromise before it goes to the Graduate College/College of Science Dean's Office for final review.

B. Examinations and Quizzes

Two (2) examinations will be given in this course. Also, up to ten (10) quizzes will be given for this course. Only under **truly exceptional circumstances** will a student be permitted to take an examination at a time other than during the scheduled examination period. Exceptional circumstances include: death or serious illness in the immediate family, childbirth, illness requiring hospitalization and illness serious enough to warrant a written dispensation from a physician. Minor illnesses are **NOT** exceptional circumstances. A written doctor's excuse stating the nature of the illness will be required. If arrangements have not been made beforehand, the student **MUST** contact the course director within 24 hours after the scheduled exam period to discuss rescheduling the exam.

C. Grades

Student performance is evaluated by scores achieved on two (2) 100 point, equally weighted block exams, and up to ten (10) 5 point quizzes. The exam and quiz format may include multiple-choice, statement completion, short and long answer essay question. Carefully check your answers to make sure all questions have been answered. Once you leave the exam rooms, you will not be allowed to make any changes to your answer sheet.

It is recommended that a meeting with the Course Director occur prior to **dropping a course**. The last day to drop an individual course is Friday, October 28. The last day to completely withdraw from fall semester is Friday, December 9.

The exam grading* will be as follows:

- A = 90 – 100%
- B = 80 – 89%
- C = 70 – 79%
- D = 60 – 69%
- F = < 59%

**Exam questions in which less than 35% of the class receives full credit will be considered for omission from the final score at the instructor's discretion. If removed, the points per exam and total points will be adjusted appropriately.*

The quiz grading** will be as follows:

- A = 90 – 100%
- B = 80 – 89%
- C = 70 – 79%
- D = 60 – 69%
- F = < 59%

***Each quiz will include a single bonus question worth 0.5 points (10% of the total score). Bonus question points do not count against the student score.*

Note: The lowest quiz score will be dropped from the final total number of points available.

D. Class Policies

University policies can be viewed at <http://www.marshall.edu/academic-affairs/policies/>

Academic Dishonesty

Academic dishonesty will not be tolerated. Policy AA-12 defines academic dishonesty and describes the sanctions associated with it. Graduate Catalog (pgs. 48-57)

http://www.marshall.edu/catalog/files/Gr_2015-16_published.pdf

Affirmative Action

This course will follow Marshall University's policy on Affirmative Action, which can be found in the MU Undergraduate Catalog and MU Graduate Catalog (pg. 36) at

http://www.marshall.edu/catalog/graduate/F2014/Gr_2041-2015_published.pdf. Specifically, all students will be afforded equal opportunity without regard to race, color, sex, religion, age, disability, national origin, or sexual orientation.

Inclement Weather

Policy GA-9 (pg. 37-38 of the Graduate Catalog,

http://www.marshall.edu/catalog/graduate/F2014/Gr_2014-2015_published.pdf) describes the policy on weather-related and/or emergency closings and delays. As this is an afternoon class, we will not be affected by delays. To find out if the University is closed, please call Audix at 696-6245.

Students with Disabilities Policy

Students with disabilities are required to prepare a notice from either the Help Center, Myers Hall, or Sandra Clements, PH 117, before a special accommodation can be honored. The link describing this policy is <http://www.marshall.edu/disabled>.

University Computing Services Acceptable Use Policy

MUBOG Policy IT-1 explains this policy and students are responsible for knowing the University Computing Services' Acceptable Use Policy available at

<http://www.marshall.edu/board/files/policies/MUBOG%20IT-%201%20Info%20Tech%20Acceptable%20Use.pdf>

Plagiarism – Review the following link regarding plagiarism:

<http://www.marshall.edu/library/plagiarism/plagiarism.asp>

COURSE OBJECTIVES

Upon completion of this section of FSC 642, the student should be able to:

1. Describe the DNA testing process.
2. Have a general understanding of the necessary validation testing procedures.
3. Have a general understanding of the quality control measures needed.

<See Absence Form on following page.>

Forensic Science Student Absence Form
Phone (304) 691-8931, Fax (304) 691-8929, forensics@marshall.edu

Please provide the information requested on this form and submit directly to the Academic Program Coordinator staton1@marshall.edu or fax 304-691-8929 with appropriate documentation. Only original documents or verified faxed copies are allowed. Where possible, approvals should be obtained prior to the expected absence.

Name:	MU ID Number:
Day of Absence:	

Please list the classes for which you are seeking an Excused Absence.

|-----REQUEST BEING MADE -----|

Course Name/Number	Date & Time	Instructor or Supervisor Name & Signature	LAB MAKE- UP	CAMTASIA	EXAM MAKE- UP	OTHER	NOTIFICATION ONLY

On the lines provided below, describe the reason for each absence.

Please note: *Routine medical appointments are not excused absences. Excused absences are approved only for the dates confirmed in your documentation and must be submitted at the time of application.*

Confidential requests can be made directly to the Program Coordinator in person.

Reason for Absence:

☐ Personal Medical Emergency

☐ Death in Family

☐ Forensic Professional Travel

☐ Other

Explanation: _____

I hereby certify that the information provided in support of this request is accurate and I authorize Marshall University Forensic Science Program to verify its contents. Submission of altered or other false documentation is a violation of the Student Code of Rights and Responsibilities and is subject to University Judicial processes.

Signature: _____ Date: _____

Program Coordinator Decision: (Circle One)

Excused Absence Unexcused Absence _____ signature & date

Students need to be assigned to labs

TechRelay Course Recording and Submission

MUFSC Security System Operation

Parking Policy for After Hours Courses

Ethics Topics

Safety Topics