



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2016/2017		
MASTER'S DEGREE (MSC)	MOLECULAR AND HEALTH BIOLOGY		
SUBJECT	APPLIED CELLULAR BIOTECHNOLOGIES FOR FORENSIC STUDIES		
TYPE OF EDUCATIONAL ACTIVITY	C		
AMBIT	20879-Attività formative affini o integrative		
CODE	10038		
SCIENTIFIC SECTOR(S)	BIO/06		
HEAD PROFESSOR(S)	CARRA ELENA	Ricercatore	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	98		
COURSE ACTIVITY (Hrs)	52		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	CARRA ELENA Tuesday 12:00 14:00 Studio del Docente, Dipartimento STEBICEF viale delle Scienze Ed. 16, piano primo, oppure anche su piattaforma Microsoft Teams previo contatto ed accordo con il docente all'indirizzo @unipa.it; il ricevimento potrà essere svolto in altro giorno e/o orario previo accordo con il docente.		

DOCENTE: Prof.ssa ELENA CARRA

PREREQUISITES	Knowledge required by the admission tests
LEARNING OUTCOMES	<p>Knowledge of the basic interpretation for autosomal STR typing by forensic DNA test for human identification purposes.</p> <p>Comprehension of the biological, legal and statistical terminology related to this discipline.</p> <p>Ability to interpret a paternity test in a correct and rigorous way, in case of autosomal STR typing or STR markers on the X and Y chromosomes.</p> <p>Ability to describe a DNA profile from the electropherogram of DNA typing results from single source or mixed samples.</p> <p>Ability to show the acquired knowledge of DNA forensic identification by performing "in itinere" exercises, aimed to the auto-evaluation of the personal level of learning and to the identification of failings, if any.</p>
ASSESSMENT METHODS	<p>Oral exam. A topic of the student's care plus a minimum of two questions and the exam is aimed to evaluate the level of self-reliance and in-depth examination shown by student. The learner will be able to describe and interconnect the different aspect of DNA Forensic Identification for criminal investigation according to Italian criminal justice system. The student must to use correct approach for a paternity test, to interpret the electropherogram of DNA typing results from single source for human identification purpose, to interpret DNA typing results from mixed samples with two or multiple contributors, and to know the basic issues with analysis of low amounts of DNA. The learner will be able to know the Italian Law 40/2004 on assisted reproduction technology (ART) and the Judgment n.151 of Constitutional Court of 2009.</p> <p>Will be asked basic remarks on the UNI CEI EN ISO / IEC 9001 - 17025 related to forensic DNA.</p> <p>The threshold of sufficiency will be reached when the student shows knowledge and comprehension of the topics at least in their outline. The more the student will successfully interact with the examiner through various lines of arguments and his/her exposition ability, and the more his/her knowledge and application abilities (recognition of paternity test, ability to interpret DNA typing results and DNA profiles for mixed samples, ability to describe the correct statistical approach for DNA typing results), get into details, the more the evaluation will be positive.</p>
EDUCATIONAL OBJECTIVES	To know autosomal STR typing by forensic DNA test. To develop a global perspective to know what DNA profiling or DNA typing means when forensic technique are used to identify individuals or trace found on crime scene. To know the guidelines for forensic DNA testing Laboratories.
TEACHING METHODS	Oral lessons; Tutorials;
SUGGESTED BIBLIOGRAPHY	<p>Introduzione alla Genetica Forense -Adriano Tagliabracci- Springer Biomed</p> <p>Indagini genetico-forensi di paternita' e identificazione personale. Linee Guida metodologico-Accertative Criteriologico-Valutative- TAGLIABRACCI - DOMENICI - PASCALI – PESARESI- Piccin</p> <p>Materiale didattico a cura del docente.</p>

SYLLABUS

Hrs	Frontal teaching
2	Introduction to forensic science and DNA forensics. The general organization of Italian Justice system. Case Report.
8	The interpretation of DNA typing results for human identification purpose: Case Report. Biological evidence evaluation . Methods in Forensic Molecular Genetics. The autosomal STR and the STR markers on X and Y Chromosome.
2	The evolution of quality standard for forensic DNA analysis: UNI CEI EN ISO / IEC 9001 - 17025
2	Sexual abuse and forensic Investigation: biological evidence evaluation, autosomal STR typing and Y-STR forensic DNA testing system
8	DNA Paternity Testing. The deficient case: motherless or alleged father not available. Probability and likelihood: the Bayesian approach. The Probability of Paternity Case report and exercise.
2	The electropherogram of DNA typing: RFU value, allele designation, locus designation, allelic ladder, virtual bin, stutter, analytical artifacts (e.g. spikes), peak height values, Thresholds, Thresholds to allelic peaks.
2	Amplification of low-level DNA samples: stochastic effects (i.e. allelic dropout or dropin), stochastic thresholds based on empirical data, amplification systems (e.g. Kits)
2	Mixtures, complex DNA profiles and interpretation. New ISFG DNA Commission guidelines to interpret mixtures
2	Statistical approaches for LTDNA mixtures interpretation: state of the art
2	Case Report: Touch DNA and LTDNA mixtures
8	Introduction on assisted reproduction technology (ART): Italian Law 40/2004; WHO ART guidelines from 2004 to 2015 at comparison; the Judgment n.151 of Constitutional Court of 2009

Hrs	Workshops
12	Biological evidence evaluation; characteristic of blood and physiological fluids (i.e. semen, saliva, urine, and other); Blood identification: presumptive tests and confirmatory tests; evidence collection, sample collection for DNA analysis of forensic evidence.