



List of New Course(s) Introduced

Department : Forensic Science

Programme Name : B.Sc.

Academic Year : 2021-22

List of New Course(s) Introduced

Sr. No.	Course Code	Name of the Course
1.	FSUATT1	Introduction to Forensic Science
2.	FSUALT1	Practical's Based on Crime Scene
3.	FSUATT2	Crime And Society
4.	FSUALT2	Practical's Based on Crime and Society
5.	FSUATG1	Elementary Forensic Science
6.	FSUALG1	Practical's Based on Crime Scene Investigation
7.	FSUATA1	Introduction To Criminalistic
8.	FSUATL1	Handwriting Identification and Recognition
9.	FSUBTT1	Criminal Law
10.	FSUBLT1	Practical's Based on Preparing Schedules
11.	FSUBTT2	Forensic Psychology
12.	FSUBLT2	Practical's Based on Forensic Psychology
13.	FSUBTG1	Applied Forensic Science
14.	FSUBLG1	Practical's Based on Applied Forensic Science
15.	FSUBTA2	Forensic Radiology
16.	FSUBTL1	Introduction to Biometry


विभागाध्यक्ष
HEAD
कोरोलिया साइल विभाग
Department of Forensic Science
गुरु घासीदास विश्व-विद्यालय,
Guru Ghasidas Vishwavidyalaya
बिलासपुर (छ.ग.)
BILASPUR (C.G.)



Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2020-21

School : School of Studies of Interdisciplinary Education And Research

Department : Forensic Science

Date and Time : March 23, 2022 - 07:00 PM

Venue : On Google Meet Platform

The scheduled meeting of member of Board of Studies (BoS) of Department of Forensic Science, School of Studies of Interdisciplinary Education & Research, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the syllabus of 3 year UG Program as per CBCS scheme and syllabi.

The following members were present in the meeting:

1. Prof. Mitashree Mitra (External Expert Member BoS, Dept. of. Forensic Science , Pt. Ravi Shankar Shula University Raipur)
2. Dr. Sudhir Yadav (HOD, Dept. of Forensic Science-cum Chairman, BOS)
3. Dr. Ajay Amit (Invited Member BoS, Dept. of Forensic Science)
4. Dr. Chanchal Kumar (Invited Member BoS, Dept. of Forensic Science)
5. Miss. Blessi N. Uikey (Invited Member BoS, Dept. of Forensic Science)

Following points were discussed during the meeting

- ❖ It was unanimously resolved that for the skill development of the students, a paper on internship/Apprentice/Training/Industrial training and/or Visit program (2 credits) for 3-4 weeks be included in B.Sc. IVth and M.Sc. IInd semester. Students will do this after the end of respective examination i.e., during summer vacation of the university from the academic session 2021-22
- ❖ To approve minor change in the syllabus of Undergraduate course of Forensic Science, Paper SEC of semester 3rd (LS/FSC/SEC/301-L & LS/FSC/SEC/301-P) and IVth (LS/FSC/SEC/402-L LS/FSC/SEC/402-P) of B.Sc. Homs. N Forensic Science.
- ❖ To discuss and approve the draft of the syllabus and Examination scheme of M.Sc. Forensic Science in accordance to CBXS from the academic session 2021-22.
- ❖ To approve Pre-Ph.D. course work syllabus and scheme of examination of department of Forensic Science for the implementation from the academic session 2021-22



- ❖ To discuss learning outcome-based curriculum frame work

The committee discussed and approved the scheme and syllabi. The following courses were revised in the of B.Sc. Course in first year (1st and 2nd year):

- ❖ FSUATT1 Introduction to Forensic Science
- ❖ FSUALT1 Practical's Based on Crime Scene
- ❖ FSUATT2 Crime and Society
- ❖ FSUALT2 Practical's Based on Crime and Society
- ❖ FSUATG1 Elementary Forensic Science
- ❖ FSUALG1 Practical's Based on Crime Scene Investigation
- ❖ FSUATA1 Introduction to Criminalistic
- ❖ FSUATL1 Handwriting Identification and Recognition
- ❖ FSUBTT1 Criminal Law
- ❖ FSUBLT1 Practical's Based on Preparing Schedules
- ❖ FSUBTT2 Forensic Psychology
- ❖ FSUBLT2 Practical's Based on Forensic Psychology
- ❖ FSUBTG1 Applied Forensic Science
- ❖ FSUBLG1 Practical's Based on Applied Forensic Science
- ❖ FSUBTA2 Forensic Radiology
- ❖ FSUBTL1 Introduction to Biometry

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Scheme and Syllabus

UG COURSE IN FORENSIC SCIENCE (THREE YEARS /SIX SEMESTERS)

Semester	Course Opted	Course Code	Name of the course	Credit	Hour /week
B.Sc I st Semester	Core-1	FSUATT1	Introduction to Forensic Science	3	3
	Core-1 Practical	FSUALT1	Practical's based on Crime Scene	2	4
	Core-2	FSUATT2	Crime and Society	3	3
	Core-2 Practical	FSUALT2	Practical's based on Crime and Society	2	4
	Generic Elective-1 (GE-1)	FSUATG1	Elementary Forensic Science	3	3
	Generic Elective - Practical	FSUALG1	Practical's based on Crime Scene Investigation	2	4
	AEC (Ability Enhancement Course) 01	FSUATA1	Introduction to criminalistics	2	2
	SEC (Skill Enhancement Course) 01	FSUATL1	Handwriting Identification and Recognition	2	2
Total Credits				19	
B.Sc II nd Semester	Core-3	FSUBTT1	Criminal Law	3	3
	Core-3 Practical	FSUBLT1	Practical's based on preparing schedules	2	4
	Core-4	FSUBTT2	Forensic Psychology	3	3
	Core-4 Practical	FSUBLT2	Practical's based on Forensic Psychology	2	4
	Generic Elective - 2 (GE-2)	FSUBTG1	Applied Forensic Science	3	3
	Generic Elective - Practical	FSUBLG1	Practical's based on Applied Forensic Science	2	4
	AEC (Ability Enhancement Course) 02	FSUBTA2	Forensic Radiology	2	2
	SEC (Skill Enhancement Course) 02	FSUBTL1	Introduction to Biometry	2	2

Suggested Readings

1. B.B. Nanda and R. K. Tiwari, Crime and Society, Century, Select Publishers, New Delhi, Delhi (2002).
2. M.K. Bhasin and S. Nath, Crime and Society, Delhi, Delhi (2002).
3. S.H. James and J. Nordby, Investigative Techniques, 2nd Edition, CRC Press, Boca Raton, Florida (2001).
4. W.G. Eckert and K.K. Wright, Forensic Psychology, CRC Press, Boca Raton, Florida (2001).
5. R. Saferstein, Criminalistics, 2nd Edition, Prentice Hall, New Jersey (2001).
6. W.J. Tilstone, M.L. Hastrup, Forensic Investigation, CRC Press, Boca Raton, Florida (2001).

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Three-year UG Course in Forensic Science
Semester – IFSUATTI
Core-1

Introduction to Forensic Science

Credits: 3

Learning Objectives: After studying this paper the students will know:

- The significance of forensic science to human society.
- The fundamental principles and functions of forensic science.
- The divisions in a forensic science laboratory.
- The working of the forensic establishments in India and abroad.

Unit 1: History and Development of Forensic Science in India

History and development of forensic science. Functions of forensic science. Nature and scope of Forensic science. Definitions and concepts in forensic science. Scope of forensic science. Need of forensic science. Basic principles of forensic science. Frye case and Daubert standard.

Unit 2: Tools and Techniques in Forensic Science

Branches of forensic science. Forensic science in international perspectives, including set up of INTERPOL and FBI, RAW and CBI. Duties of forensic scientists. Ethics in forensic science. Code of conduct for forensic scientists. Qualifications of forensic scientists. Data depiction. Report writing. Expert testimony.

Unit 3: Organizational set up of Forensic Science Laboratories in India

Hierarchical set up of Central Forensic Science Laboratories, State Forensic Science Laboratories, Government Examiners of Questioned Documents, Fingerprint Bureaus, National Crime Records Bureau, Police & Detective Training Schools, Bureau of Police Research & Development, Directorate of Forensic Science and Mobile Crime Laboratories.

Unit 4: Police Science

Definition and scope, Organizational set up of Police at State, Range and District level. State armed forces and home guards. Role of Police in crime investigations. State criminal investigation departments, FIR, Police dogs. Services of crime laboratories. Basic services and optional services.

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Suggested Readings

1. B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi (2001).
2. M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002).
3. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
4. W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997).
5. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).
6. W.J. Tilstone, M.L. Hastrup and C. Hald, Fisher's Techniques of Crime Scene Investigation, CRC Press, Boca Raton (2013).

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Three-year UG Course in Forensic Science

Semester- IFSUALT1

Core -1 (Practical)

Practicals based on Crime Scene Investigation

Credits:3

1. To study the history of crime cases from forensic science perspective.
2. To cite examples of crime cases in which apprehensions arose because of Daubert standards.
3. To review the sections of forensic science at INTERPOL and compare with those in Central Forensic Science Laboratories in India. Include suggestions for improvements if any.
4. To study the annual reports of National Crime Records Bureau and depict the data on different type of crime cases by way of smart art/templates.
5. To write report on different type of crime cases.
6. To review how the Central Fingerprint Bureau, NewDelhi, coordinates the working of State Fingerprint Bureaus.
7. To examine the hierarchical setup of different forensic science establishments and suggest improvements.
8. To examine the list of projects undertaken by the Bureau of Police Research and Development and suggest the thrust areas of research in Police Science.
9. To compare and contrast the role of a Police Academy and a Police Training School.
10. To compare the code of conduct prescribed by different establishments for forensic scientists.

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Three-year UG Course in Forensic Science
Semester - I **FSUATT2**
Core-2
Crime and Society

Credits: 3

Learning Objectives: After studying this paper the students will know:

- The importance of criminology.*
- The causes of criminal behavior.*
- The significance of criminal profiling to mitigate crime.*
- The consequences of crime in society.*
- The elements of criminal justice system.*

Unit 1: Basics of Criminology

Criminology: Definition, aims, nature and scope, Concept of Crime, Brief Introduction of Theories of criminal behavior such as classical, positivist, sociological etc.; Criminal profiling, Understanding *Corpus delicti* and *Modus operandi*.

Unit 2: Crime

Crime: Elements, nature, causations and consequences of crime, Classification of crime and criminals, Deviant behavior, public disorders, domestic violence and workplace violence, Psychological Disorders and Criminality.

Unit 3: Recent Advancements in Crimes

Brief Introduction towards: Victimology, Juvenile delinquency, Hate crimes, Organized crimes, Situational crime, Economic crime, Sexual Offences, Crime due to intoxication, Cybercrimes and White-collar crimes, Modern Approaches towards Investigative strategy and Role of Media in the solution of crime.

Unit 4: Criminal Justice System

Broad Components of criminal justice system, Policing styles and principles, Police's power of investigation, filing of criminal charges, Community policing, Policing a heterogeneous society, Correctional measures and rehabilitation of offenders, Human rights and criminal justice system in India.

23/03/2022

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Suggested Readings:

1. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
2. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey(2004).
3. J.L. Jackson and E. Barkley, Offender Profiling: Theory, Research and Practice, Wiley, Chichester(1997).
4. R. Gupta, Sexual Harassment at Workplace, LexisNexis, Gurgaon(2014).
5. Paranjape, N.V. Criminology and Penology, Central Law Publication, Allahabad.
6. William Bailey, The Encyclopedia of Police Science, Second Edition Garland publishing, INC, London.
7. Suderland, E. Hand Donald R. Cressy, The Principals of Criminology, The Times of India Press, Bombay, 1968
8. Ahuja, Ram Criminology, Rawat Publication, Jaipur
9. Wayne Petherick, Brent Turvey, Claire Ferguson, Forensic Criminology, Academic Press Donald, J. (1992), The Police Photographer's Guide, Photo Test Books, Arlington Heights.

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Three-year UG Course in Forensic Science

Semester- IFSUALT2

Core-2 (Practical)

Practical based on Crime and Society

Credit:2

1. To review past criminal cases and elucidate which theory best explains the criminal behavior of the accused.
2. To review crime cases where criminal profiling assisted the police to apprehend the accused.
3. To cite examples of crime cases in which the media acted as a pressure group.
4. To evaluate the post-trauma stress amongst victims of racial discrimination.
5. To correlate deviant behavior of the accused with criminality (take a specific example).
6. To evaluate Victimology in a heinous crime.
7. To examine a case of juvenile delinquency and suggest remedial measures.
8. To evaluate how rising standards of living affect crime rate.
9. To review the recommendations on modernization of police stations and evaluate how far these have been carried out in different police stations.
10. To visit a 'Model Police Station' and examine the amenities vis-à-vis conventional police stations.
11. To examine steps being taken for rehabilitation of former convicts and suggest improvements.
12. To prepare a report on interrogation cells and suggest improvements.

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Three-year UG Course in Forensic Science
Semester – II -FSUBTT1
Core - 3
Criminal Law

Credits: 3

Learning Objectives: After studying this paper the students will know:

- Elements of Criminal Procedure Code related to forensic science.*
- Acts and provisions of the Constitution of India related to forensic science.*
- Acts governing socio-economic crimes.*
- Acts governing environmental crimes.*

Unit 1: Law to Combat Crime

Introduction towards Indian Penal Code, Criminal Procedure Code and Indian Evidence Act, Relevant sections of IPC pertaining to offences against persons, property, Cr.PC, IEA and their Amendments.

Unit 2: Crime and Criminology

Classification of cases, Types of offences, Essential elements of criminal law, Constitution and hierarchy of criminal courts, Legal procedure pertaining to expert witness testimony, Expert witness.

Unit 3: Constitution of India

Preamble, Fundamental Rights, Directive Principles of State Policy– Articles 14, 15, 20, 21, 22, 51A, summary trial-Section 260 (2) and Judgments in abridged forms-Section 355.

Unit 4: Acts Pertaining to Socio-economic and Environmental Crimes

Detail description of Narcotic, Drugs and Psychotropic Substances (NDPS) Act, Essential Commodity Act, Drugs and Cosmetics Act, Explosive Substances Act, Arms Act, Dowry Prohibition Act, Prevention of Food Adulteration Act, Prevention of Corruption Act, Wildlife Protection Act, I.T. Act 2000, Environment Protection Act, Untouchability Offences Act.

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Suggested Readings:

- 1.D.A. Bronstein, Law for the Expert Witness, CRC Press, Boca Raton (1999).
- 2.Vipa P. Sarthi, Law of Evidence, 6th Edition, Eastern Book Co., Lucknow (2006).
- 3.A.S. Pillia, Criminal Law, 6th Edition, N.M. Tripathi Pvt Ltd., Mumbai (1983).
- 4.R.C. Nigam, Law of Crimes in India, Volume I, Asia Publishing House, New Delhi (1965).
- 5.(Chief Justice) M. Monir, Law of Evidence, 6th Edition, Universal Law Publishing Co. Pvt. Ltd., New Delhi (2002).
6. Bayer Acts of Indian Penal Code, Criminal Procedure Code and Indian Evidence Act.
7. Turrey B; Criminal Profiling - An Introduction to Behavioral Evidence Analysis, Acad. Press Lond
8. Paranjape, N.V. Criminology and Penology, Central Law Publication, Allahabad.
9. William Bailey, The Encyclopedia of Police Science, Second Edition Garland publishing, INC, London.
10. Suderland, E. Hand Donald R. Cressy; The Principals of Criminology, The Times of India Press, Bombay, 1968
11. Reid, Sue Titus, Crime and Criminology, The Dryden Press, Illions
12. Ahuja, Ram Criminology, Rawat Publication, Jaipur
13. Suderland, E.H.; White Collar Crime, The Dryden Press, Newyork
14. Wayne Petherick, Brent Turvey, Claire Ferguson, Forensic Criminology, Academic Press
15. Donald, J. (1992), The Police Photographer's Guide, Photo Test Books, Arlington Heights,

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Three-year UG Course in Forensic Science
Semester – II FSUBLT1
Core - 3 Practical
Practical based on preparing schedules

Credit: 2

1. To prepare a schedule of five cognizable and five non-cognizable offences.
2. To study the powers and limitations of the Court of Judicial Magistrate of First Class.
3. To prepare a schedule of the offences this may be tried under Section 260(2) of Criminal Procedure Code.
4. To study a crime case in which an accused was punished on charge of murder under Section 302.
5. To study a crime case in which an accused was punished on charge of rape under Section 375.
6. To cite example of a case in which the opinion of an expert was called for under Section 45 of the Indian Evidence Act.
7. To cite a case wherein a person was detained under Article 22(5) of the Indian Constitution. Express your views whether the rights of the person as enlisted in this Article were taken care of.
8. To cite a case under Article 14 of the Constitution of India wherein the Right to Equality before Law was allegedly violated.
9. To list the restrictions imposed on Right to Freedom of Worship under the Constitution of India.
10. To prepare a schedule of persons convicted under Narcotics, Drugs and Psychotropic Act statistically analyze the age group to which they belonged.
11. To study a case in which Drugs and Cosmetic Act was invoked.
12. To study a case in which Explosive Substances Act was invoked.
13. To study a case in which Arms Act was invoked.
14. In light of Section 304B of the Indian Penal Code, cite a case involving dowry death.
15. To study a case where in the Untouchability Offences Act was invoked on the basis of Article 15 of the Constitution of India.

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Three-year UG Course in Forensic Science
Semester - II FSUBTT2
Core- 4

Credits: 3

Forensic Psychology

Learning Objectives: After studying this paper the students will know –

- The overview of forensic psychology and its applications.*
- The legal aspects of forensic psychology.*
- The significance of criminal profiling.*
- The importance of psychological assessment in gauging criminal behavior.*

Unit 1: Basics of Forensic Psychology

Definition and fundamental concepts, Forensic psychiatry, Psychology and law. Ethical issues in forensic psychology. Mental disorders and forensic psychology. Psychology of evidence – eyewitness testimony, confession evidence. Criminal profiling. Psychology in the courtroom, with special reference to Section 84 IPC (McNaughton's Rule), Durham Rule of Insanity.

Unit 2: Psychological Disorders

Classification of psychiatric disorders- Common Psychiatric Disorders- Schizophrenia, Bipolar Disorders, Anxiety Disorders, Phobia, Personality Disorder, Attention Deficit Hyperactive Disorder, Psychology of Serial murderers, terrorism. Use of Media and Intelligence for Commission of Crime. Gender Justice and Crime.

Unit 3: Juvenile delinquency

Theories of offending (social cognition, moral reasoning), Child abuse (physical, sexual, emotional), Juvenile Sex Offenders, legal controversies. Laws Related to Forensic Psychology & Competency to Stand Trial, Criminal and Civil Responsibilities.

Unit 4: Deception Detection Tools

(Interviews, non-verbal detection, statement analysis) Voice stress analyzer, Hypnosis, Polygraphy – operational and question formulation techniques, ethical and legal aspects, the guilty knowledge test. Narco analysis and Brain Fingerprinting – principle and theory, ethical and legal issues.

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Suggested Readings

1. A.A. Moenssens, J. Starrs, C.E. Henderson and F.E. Inbau, Scientific Evidence in Civil and Criminal Cases, 4th Edition, The Foundation Press, Inc., New York (1995).
2. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).
3. J.C. DeLadurantey and D.R. Sullivan, Criminal Investigation Standards, Harper & Row, New York (1980).
4. J. Niehaus, Investigative Forensic Hypnosis, CRC Press, Boca Raton (1999).
5. E. Elaad in Encyclopedia of Forensic Science, Volume 2, J.A. Siegel, P.J. Saukko and G.C. Knupfer (Eds.), Academic Press, London (2000).

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Three-year UG Course
Semester – II FSUBLT2
Core-4 Practical
Practical based on Forensic Psychology

Credits:2

1. To cite a crime case where legal procedure pertaining to psychic behavior had to be invoked.
2. To prepare a report on relationship between mental disorders and forensic psychology.
3. To review a crime case involving serial murders. Comment on the psychological traits of the accused.
4. To cite a crime case involving a juvenile and argue for and against lowering the age for categorizing an individual as juvenile.
5. To study a criminal case in which hypnosis was used as a means to detect deception.
6. To prepare a case report on Minnesota multiphasic personality inventory test.
7. To prepare a case report on Bhatia's battery of performance test of intelligence.
8. To cite a criminal case in which narcoanalysis was used as a means to detect deception.

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Department : Forensic Science

Programme Name : M.Sc.

Academic Year : 2021-22

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Sr. No.	Course Code	Name of the Course
1.	FSPATT1	Forensic Science & Criminology
2.	FSPATT2	Crime Scene Management
3.	FSPATT3	Instrumental Analysis in Forensic Science
4.	FSPATT4	Forensic Biology and Serology
5.	FSPALT1	Practical's Based on Crime Scene Management
6.	FSPALT2	Practical's Based on Forensic Biology and Serology
7.	FSPAST1	Seminar
8.	Fspbtt1	Questioned Document and Fingerprint
9.	Fspbtt2	Forensic Genetics and DNA Profiling
10.	FSPBTT3	Forensic Chemistry and Toxicology
11.	Fspbtt4	Research Methodology and Ethics
12.	FSPBTD1	Forensic Psychiatry
13.	FSPBTD2	Wildlife Forensic and Forensic Entomology
14.	FSPBLT1	Practicals Based on Forensic Genetics and DNA Profiling
15.	FSPBLT2	Practicals Based on Forensic Chemistry and Toxicology
16.	FSPBLD1	Practicals Based on Forensic Psychiatry
17.	FSPBLD2	Practicals Based on Wildlife Forensic and Forensic Entomology
18.	FSPBST1	Seminar


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Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2020-21

School : School of Studies of Interdisciplinary Education And Research

Department : Forensic Science

Date and Time : March 23, 2022 - 07:00 PM

Venue : On Google Meet Platform

The scheduled meeting of member of Board of Studies (BoS) of Department of Forensic Science, School of Studies of Interdisciplinary Education & Research, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the syllabus of 3 year UG Program as per CBCS scheme and syllabi.

The following members were present in the meeting:

1. Prof. Mitashree Mitra (External Expert Member BoS, Dept. of. Forensic Science , Pt. Ravi Shankar Shula University Raipur)
2. Dr. Sudhir Yadav (HOD, Dept. of Forensic Science-cum Chairman, BOS)
3. Dr. Ajay Amit (Invited Member BoS, Dept. of Forensic Science)
4. Dr. Chanchal Kumar (Invited Member BoS, Dept. of Forensic Science)
5. Miss. Blessi N. Uikey (Invited Member BoS, Dept. of Forensic Science)

Following points were discussed during the meeting

- ❖ It was unanimously resolved that for the skill development of the students, a paper on internship/Apprentice/Training/Industrial training and/or Visit program (2 credits) for 3-4 weeks be included in B.Sc. IVth and M.Sc. IInd semester. Students will do this after the end of respective examination i.e., during summer vacation of the university from the academic session 2021-22
- ❖ To approve minor change in the syllabus of Undergraduate course of Forensic Science, Paper SEC of semester 3rd (LS/FSC/SEC/301-L & LS/FSC/SEC/301-P) and IVth (LS/FSC/SEC/402-L LS/FSC/SEC/402-P) of B.Sc. Homs. N Forensic Science.
- ❖ To discuss and approve the draft of the syllabus and Examination scheme of M.Sc. Forensic Science in accordance to CBXS from the academic session 2021-22.
- ❖ To approve Pre-Ph.D. course work syllabus and scheme of examination of department of Forensic Science for the implementation from the academic session 2021-22
- ❖ To discuss learning outcome-based curriculum frame work

The committee discussed and approved the scheme and syllabi. The following courses were revised in the of M.Sc. Course in first year (1st and 2nd year):

- ❖ FSPATT1 Forensic Science & Criminology



- ❖ FSPATT2 Crime Scene Management
- ❖ FSPATT3 Instrumental Analysis in Forensic Science
- ❖ FSPATT4 Forensic Biology and Serology
- ❖ FSPALT1 Practical's Based on Crime Scene Management
- ❖ FSPALT2 Practical's Based on Forensic Biology and Serology
- ❖ FSPAST1 Seminar
- ❖ FSPBTT1 Questioned Document and Fingerprint
- ❖ FSPBTT2 Forensic Genetics and DNA Profiling
- ❖ FSPBTT3 Forensic Chemistry and Toxicology
- ❖ FSPBTT4 Research Methodology and Ethics
- ❖ FSPBTD1 Forensic Psychiatry
- ❖ FSPBTD2 Wildlife Forensic and Forensic Entomology
- ❖ FSPBLT1 Practicals Based on Forensic Genetics and DNA Profiling
- ❖ FSPBLT2 Practicals Based on Forensic Chemistry and Toxicology
- ❖ FSPBLD1 Practicals Based on Forensic Psychiatry
- ❖ FSPBLD2 Practicals Based on Wildlife Forensic and Forensic Entomology
- ❖ FSPBST1 Seminar

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Scheme and Syllabus

PG COURSE IN FORENSIC SCIENCE
(TWO YEARS / FOUR SEMESTERS)

		M.Sc. 1 st semester		Hours/ week	Credit
M.Sc. 1 st semester	Core -1	FSPATT1	Forensic Science & Criminology	3	3
	Core -2	FSPATT2	Crime Scene management	3	3
	Core -3	FSPATT3	Instrumental analysis in Forensic sciences	3	3
	Core -4	FSPATT4	Forensic Biology and Serology	3	3
	Lab -1	FSPALT1	Practical's Based on Crime Scene management	6	3
	Lab -2	FSPALT2	Practical's Based on Forensic Biology and Serology	6	3
		FSPAST1	Seminar	2	2
Total credits					20
M.Sc. 2 nd semester	Core -5	FSPBTT1	Questioned Documents and Fingerprints	3	3
	Core -6	FSPBTT2	Forensic Genetics and DNA Profiling	3	3
	Core -7	FSPBTT3	Forensic Chemistry and Toxicology	3	3
	Core -8	FSPBTT4	Research Methodology and Ethics	3	3
	Elective- 1*	FSPBTD1	Forensic Psychiatry	3	3
	Elective- 2*	FSPBTD2	Wildlife Forensics AND Forensic Entomology		
	Lab -3	FSPBLT1	Practical's Based on Forensic Genetics and DNA Profiling	6	3
	Lab -4	FSPBLT2	Practical's Based on Forensic Chemistry and Toxicology	6	3
	Lab -5	FSPBLD1	Practical's Based on Forensic Psychiatry	6	3
	Lab -6	FSPBLD2	Practical's Based on Wildlife Forensics and Forensic Entomology		
		FSPBST1	Seminar	2	2
			Summer / Field/Industrial Training	--	2
Total Credits					26+2
M.Sc. 3 rd semester	Core -9	FSPCTT1	Computer Forensics and Digital investigations	3	3
	Core -10	FSPCTT2	Forensic Ballistics and Physics	3	3
	Core -11	FSPCTT3	Forensic Medicine	3	3
	Core -12	FSPCTT4	Forensic Anthropology	3	3
	Elective - 3**	FSPCTD1	Forensic Genomics, Proteomics and Bioinformatics	2	2
	Elective - 4**	FSPCTD2	Forensic Microbiology and Immunology	2	2

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M.Sc. Forensic Science

Semester- I FSPATTI

Forensic Science and Criminology

(Core-1)

Maximum Marks:100

Allotted credits: 03

UNIT I: Introduction to Forensic Science

Definition, Scope, History and Development, Nature need and Functions of Forensic science, Basic Principles of Forensic Science, Modus Operandi, Corpus Delicti, Organizational structure of Forensic Science Laboratories at State and Central level, FPB, NICFS, CDTS (Central Detective Training School), NCRB, Ethics in Forensic Science, Duties of Forensic Scientist, Laboratory management system and Importance of accreditation in forensic science laboratories.

UNIT II

Law- General idea to IPC offences against person, offences against property, IEA (Sec 32, 45, 46, 47, 57, 58, 60, 65, 65B, 73, 135, 136, 137, 159), CrPC – Introduction, definitions, FIR, NCR, FIR and its evidentiary value, Complaint, bailable and Non-bailable offenses, powers of courts, Summons, warrant, relevant sections (CrPC Sec 154, 155, 174, 175, 291, 292, 293), and its relevant sections related to Forensic Science, Procedure for Investigation, Bail, Pre Trial Proceedings, Trial, Parole, Remand, Rights of accused and Victim.

UNIT III

Criminology: Definition & scope, crime & Criminal, Introduction to classification of Offences, theories of Crime causation Brief introduction to schools of Criminology; White Collor crime, Organized Crimes, Economic crimes, Cybercrimes, Crime against children and women.

UNIT IV

Police Science: Police Organizations at State and Central Level, Introduction to CBI, BPR&D. Interpol its Role and functions. Introduction to Punishment, theories and types.

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Course outcome:

By the end of this course, students will be able to understand the concept of forensic organization, IPC, CrPC section, classification of crimes and police organization:

Learning Outcomes:

1. The students will learn about Principles and fundamentals of Forensic science and various Forensic organisational setup in India
2. They will learn various legal aspects, different offences and relevant sections of law.
3. They will learn about the criminological theories, Police Organisational Setup and its function in India.
4. They will able to learn different types of crime like cybercrime, crime against women etc.

Recommended Book

1. Sharma, B.R.: Forensic Science in Criminal Investigation and Trials, Central Law Agency, Allahabad, 1974.
2. Lundquest & Curry: Forensic Science, Vol.IV, 1963, Charls C. Thomas, Illinois, USA.
3. Saferstein : Forensic Science Handbook, VolI, II & III, Prentice Hall Inc. USA.
4. Saferstein: Criminalistics, 1976, Prentice Hall Inc. USA.
5. Kirk: Criminal Investigation, 1953, Interscience Publisher Inc. New York.
6. Lee & Gaensselen: Advances in Forensic Science (Vol.2) Instrumental Analysis.
7. Kleiner, Munay(2002):Handbook ofPolygraph testing. AcademicPress.
8. Hess, A.K.and Weiner,J.B.(1999)HandbookofForensicPsychology2ndEd.Johnwiley& sons.
9. BruceA. Arrigo (2000) Introduction to Forensic Psychology Academic Press, London
10. N. Gilbert; Criminal Investigation; Third edition, Macmillan Publishing Company, 1993.

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M. Sc in Forensic Science

Semester -I FSPATT2

Crime Scene Management

Core-2

Maximum Marks: 100

Allotted Credits: 03

Unit I:

Introduction to Crime scene investigation Definition and Types of Crime scene, Principles of Forensic science, Experts team Composition, Role of First responding officer, Physical Evidences. Introduction, Definition, Types and their collection, Preservation, packaging, transporting and forwarding, various techniques used for handling, Physical and trace evidences, Crime scene tool kits and equipment's etc. Ethics in Crime Scene Investigation.

Unit II


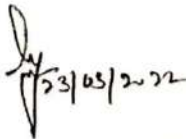
Digital evidence: Introduction, Definition types and their collection, preservation, packaging, transporting, storage and forwarding, Methodological approach to processing the crime scene. Processing a crime scene, Searching the scene-Types of Searches, Zone Search: Ever Widening, Circle Strip Search, and Grid Search, Indoor searches and outdoor searches.

Unit III

Crime Scene Documentation, Crime Scene Photography, Videography, sketching and mapping. Chain of custody, interpreting a crime scene, Reconstruction of a crime scene.

Unit IV

Crime scene management of crime scene investigation in the cases of fire and Arson, Explosions, Burglary and Theft, Hit & run, Sexual offences, Death investigation. Use of Forensic light sources for detection of biological evidences at scene of crime scene, Presumptive test for identifying narcotic drugs, blood, semen, explosive and Gunshot residue sets. Computer graphics, Electronic Detectors ND Magnetic locators.

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M.Sc. in Forensic Science

Semester –I FSPALT1

Practicals based on Crime Scene Management

(Lab-1)

Maximum Marks: 100

Allotted credits: 03

1. Evaluation of Crime scene and photographs
2. Searching of physical evidence at crime scene.
3. Collection of evidence with individual characteristics: (1) Fingerprints (2) Tire tracks and foot impressions
4. Analysis of pattern –Blood stain pattern, Fire pattern
5. Lifting of prints and impressions by caste and replicas.
6. Sole prints comparison and their lifting from the scene of crime.
7. Collection, packing and preservation of biological evidences
8. Reconstruction of crime scene
9. Preparation of report of the examination.

Course outcome:

By the end of this course, students should be able to understand the various techniques of crime scene managements and evidence collection, preservation and transportation.

Learning Outcomes:

1. Understand the scientific principles of crime scene investigation and reconstruction, including evidence collection and preservation.
2. They will understand different crime scenarios and investigative techniques, analysis of evidence, and courtroom testimony.
3. From Practical aspect they will learn investigation of crime scene and various techniques and methods for evidence examination.


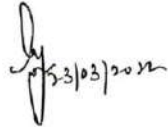
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Recommended Books

1. Saferstein, Criminalistics: An Introduction to Forensic Science Prentice Hall INC, USA
2. James S.H. and Nordby, J.J. : Forensic Science- An introduction to scientific and Investigative Techniques, CRC Press USA.
3. Eckert W.G. Introduction to Forensic Sciences, CRC, New York
4. Siegel, J. A., Saukko, P. J. And Knupfer, G.C., Encyclopedia of Forensic Sciences, Academic Publishers, London
5. Kirk, P.L. Fire Investigations, John Wiley and Sons
6. Kirk, P.L.; Criminal Investigation, Interscience Publisher Inc New York.
7. Anita. Y. Wonder; Bloodstain Pattern Elsevier, London
8. Barry, A.J. Fisher.; Techniques of Crime Scene Investigation, 6th Edition Ed, C.R.C Press NY (2003)
9. Mordby, J. Deed Reckoning; The Art of Forensic Detection, CRC Pre LLC (2000)
10. Eckett, W.G & James S.H; Interpretation of Bloodstains, Evidence of Crime Scene, Elsevier Pub. NY (1989)

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PG Course in Forensic Science

Semester -I FSPATT3

Instrumental analysis in Forensic Science

(Core-3)

Maximum Marks: 100

Allotted credits: 03

UNIT I: Spectroscopy

Concept of analytical forensic chemistry, qualitative and quantitative analysis. Basic concepts of Atomic spectra, Energy levels and Molecular spectra, Electromagnetic spectrum, Sources of radiation, Interaction of Energy and Matter, Introduction to spectroscopy, Basic Principle involve in various spectroscopic techniques, calibration methods, UV-Visible spectroscopy: Basic concepts, Principles and Forensic applications of UV-visible spectroscopy, Lambert-Beer law and its deviations, fluorescence spectroscopy, Luminometry, InfraRed (IR) and Raman spectroscopy, Fourier transform InfraRed (FTIR) spectrophotometer, Surface Plasma Resonance (SPR), Nuclear Magnetic Resonance spectroscopy

UNIT II: Chromatography

Chromatography: General introduction to chromatography, Basic concepts, principles, performance parameter and functions. Thin Layer chromatography (TLC), Affinity Chromatography, Gel Exclusion Chromatography, Ion Exchange chromatography, High Performance Liquid Chromatography (HPLC), Gas Chromatography (GC) and High-performance Thin layer Chromatography (HPTLC). Detector and its types.

UNIT III: Spectrophotometry

Spectrophotometry: General introduction, Basic concepts, Principles and Forensic application of Atomic Absorption Spectrophotometry (AAS), Atomic emission Spectrometry (AES), Inductive coupled plasma (ICP), X-ray diffraction (XRD), X-ray Photoelectron spectroscopy (XPS), Mass spectrometry, Differential Scanning Calorimeter (DSC), Differential Thermal Analyzer (DTA), Neutron Activation Analysis (NAA),

UNIT IV: Forensic DNA Technology and Microscopy

DNA sequencing methods, Capillary electrophoresis, Genetic Analyzer, Polymerase Chain Reaction, Real Time PCR, Microarray, Karyotyping and FISH, Basic principles of Microscopy, Comparison microscope, Stereoscopic microscope, Fluorescent Microscopy, Infrared Microscope, Scanning Electron Microscope (SEM) & Transmission Electron Microscope (TEM)

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Learning Outcomes:

1. The students will learn about basic concept of analytical chemistry and spectroscopic techniques and its application in forensic science.
2. They will learn how to separate and analyses the analytes from the crime scene samples.
3. They will learn advance spectrophotometric and microscopy techniques for analysis of the crime scene samples.
4. They will learn modern recombinant DNA technology and its application in forensic science

Recommended Books

1. Sharma, B.R. Scientific Criminal investigation, Universal Law Publishing Co.
2. Eckert W.G. Introduction to Forensic Sciences ,CRC, New York
3. Siegel, J.A., Saukko, P. J. And Knupfer, G.C., Encyclopedia of Forensic Sciences, Academic Publishers, London.
4. John C. Lindon, George E. Tranter & John L. Holmes; Encyclopedia of Spectroscopy & Spectrometry, Academic Press (2000)
5. Cottrell, C.T. Irish, D., Msters VM., and Steward, J.E. (1985) Introduction to ultraviolet and visible spectrophotometry, 2nd ed. Pye Unicam, Cambridge A Practical Guide to Modern NMR for Chemists, OUP, Oxford, 2000
6. Gunther, H., NMR Spectroscopy. Basic Principles, Concepts and Applications in Chemistry, 2nd Edn, Wiley, Chichester, 1995 Davis, R. and Frearson, M. (1987) Mass Spectrometry, Wiley, London Alan Gunn Essential forensic biology Jhon. Wiley
7. Barbara Wheeler Lori J. Wilson, P ractical Forensic Microscopy: A Laboratory Manual.
8. Bryan L. William & Keith Wilson; Principles & Techniques of Practical Biochemistry, Edward Arnold Pub. (1975)
9. Keith Wilson & John Walker; Practical Biochemistry- Principles & Techniques, 5th Ed., Cambridge University Press
10. George M. Malacinski; Essentials of Molecular Biology, 4th Ed. Jones and Bartlet Pub. (2003).
11. Gardnes & Snustd; Principles of Genetics 6th Ed., John Wiley & Sons
12. Working Procedure Manual Biology/ Serology, DFS Pub New Delhi, 2005



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M.Sc. Forensic Science

Semester -I FSPALT2

Practical's based on Forensic Biology and Serology

(Lab-02)

1. PBMC isolation and cell counting by hemocytometer.
2. ABO blood grouping.
3. Presumptive and Confirmatory test of semen.
4. Presumptive and Confirmatory test of blood.
5. Starch iodine test for Saliva.
6. Immunodiffusion techniques
7. Forensic Report writing.
8. Identification of developmental stage of housefly.
9. Age estimation of plant by analysis of annual ring.
10. Blood pattern analysis.

Course Outcome:

This course will provide students with an overview of basic of forensic biology and current development in the field of forensic serology.

Student Learning Outcomes:

By the end of this course, students should be able to:

1. Understand the types, nature and importance of biological evidences.
2. Understand biochemical property of biological evidence.
3. Understand basics and practical aspects of various serological and biological techniques applied in identification and preservation of biological evidences.
4. Understands the various aspects of wildlife forensic and entomology.

Recommended Books

1. Robertson, J. (1996): Forensic Examination of Hair. Taylor and Francis, USA.
2. Modi, J.K.: Medical Jurisprudence and Toxicology, N. M. Tripathi Pvt. Ltd.
3. Fraser, Roberts J.A. (1965): An introduction to Medical Genetics.
4. Chatterjee, C.C. (1975): Human Physiology.

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5. Boorman, K. E: Blood Group Serology, Churchill, and Lincoln, P. J. (1988)
6. Race, R.R. and Sangar, R. Blood Groups in Man. Blackwell Scientific, Oxford.
7. Saferstein, R. (1982): Science Handbook, Vol. I, II and III, Prentice Hall,
8. Barris, H. and Hopkinson, D. A. (1976): Handbook of Enzyme, Electrophoresis, Elsevier, North, Holland, New York.
9. Gilblet, E. (1969): Marker's in Human Blood, Davis, Pennsylvania.
10. Culliford, B. E. (1971), the examination and Typing of Blood Stains, US Dept. of Justice, Washington.
11. Chowdhuri, S. (1971): Forensic Biology, BPR&D, Govt. of India.
12. Dunsford, I. and Bowley, C. (1967): Blood Grouping Techniques, Oliver & Boyd, London.
13. Eckert, W. G. & James, S. H. (1989): Interpretation of Blood Stain, Evidence, Elsevier, New York.
14. Coyle, H. M., Forensic Botany, CRC Press Working procedure manual: Biology/Serology; DFS, New Delhi.
15. Mary Alice Walker, Entomology and Palynology (Solving Crimes with Science: Forensics) Mason Crest Publisher.
16. Essential Forensic Biology, Alan Gunn, Wiley

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M.Sc. Forensic Science
Semester -I FSPAST1

Seminar

Maximum Marks: 50

Allotted credits: 02

Seminar based on Recent trends in Research related to topics taught in current Semester.

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M.Sc. Forensic Science
Semester II- FSPBTT1
Questioned Documents
(Corc-5)

Maximum Marks: 100

Allotted credits: 03

UNIT I

Nature and problems of Document examination, Classification of documents, Types of Forensic Documents; Collection of questioned Documents, Specimen and Requested handwriting, handling, preservation, marking and forwarding of documents to the laboratory; Writing instruments and their characteristics. Characteristic features in Handwriting: Principles of handwriting Identification, Comparison, Class and Individual Characteristic of Handwriting, Factors affecting hand writing.

UNIT II

Forgery, Types of Forgery, Examination of Forgery, Examination of Signature characteristics, Age determination of documents, Alterations in Documents, Examination of Paper & Ink, Examination of typed documents, Examination of Seal, rubber & other mechanical impressions, Handling and examination of charred documents, Examination of Forged currency notes. Basic tools needed for Forensic document examination, Photography of documents, Principle and Forensic significance of Video Spectral comparator (VSC), Electrostatic detection apparatus (ESDA). Disguised, Indented and secrete writings, Anonymous letters.

UNIT III

History and development of finger prints, Structure of ridged skin, Composition of Sweat Classification of finger Prints, pattern types, classification of Fingerprints (Primary to key classification), Ridge Counting, Ridge Tracing, and Minutiae Examination, Methods of taking fingerprint from living person: Rolled & Plain Searching of finger print evidence on crime scene.

UNIT IV

Chance Finger Prints: Conventional methods of development of latent finger prints, Development of Latent fingerprint: Physical, Chemical and Fuming method, Metal Deposition Techniques, Systematic approach to latent print processing, preserving and lifting of finger prints; Photography of Finger Prints, comparison of finger prints. Automatic Finger Print Identification system (AFIS), Expert evidence. Admissibility of Fingerprint, Admissibility of Fingerprint.

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Course outcome

This course will provide student with basic knowledge of questioned Document and Fingerprint as an Important Evidence in Forensic Science and Examination of these evidence for courtroom trial.

Student learning Outcome

By the End of This Course Students will able to learn:

1. The importance of examining questioned documents and Fingerprint examination in crime cases.
The importance of detecting frauds and forgeries by analyzing questioned documents.
2. They will Understand the Fundamentals of fingerprints analysis and comparison of Fingerprints for Identification Purpose
3. Natural variations and fundamental divergences in handwritings. Examination of counterfeit Indian currency notes, passports, visas and stamp papers, seal, rubber & other mechanical impressions.
4. They will learn different tools and techniques used development of latent fingerprint on Crime scene.

Recommended Books

1. Hilton; O. Scientific Examination of Questioned Documents, Elsevier, NY
2. Albert S. Osborn; Questioned Documents, 2nd Ed., Universal Law Pub., Delhi
3. Wilson R. Harrison; Suspect Documents Their Scientific Examination, Universal Law Pub. Delhi Indian
4. Hardless H.R; Disputed Documents, Handwriting and Thumbs-Print identification, profusely illustrated, Law Book, Allahabad
5. Morris Ron N. Forensic Handwriting Identification; Academic Press, London.
6. Roy A Huber, A.M. Headrick; Handwriting Identification-Facts and Fundamental, CRC Press
7. Laboratory working procedure manual, Documents DFS, New Delhi, 2005
8. J.E. Cowger, Friction Ridge Skin, CRC Press, Boca Raton (1983).

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9. D.A. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis, CRC Press, Boca Raton (2000).
10. C. Champod, C. Lennard, P. Margot and M. Stoilovic, Fingerprints and other Ridge Skin Impressions, CRC Press, Boca Raton (2004).
11. Lee and Gaenslen's, Advances in Fingerprint Technology, 3rd Edition, R.S. Ramotowski (Ed.), CRC Press, Boca Raton (2013).

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(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)
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Guru Ghasidas Vishwavidyalaya
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)
Koni, Bilaspur - 495009 (C.G.)



M.Sc. Forensic Science

Semester -II FSPBTT2

Forensic Genetics & DNA Profiling
(Core-6)

Maximum Marks: 100

Allotted credits: 03

UNIT-I: Molecular Biology of gene

DNA: An Introduction to Genetic Material, Structure of DNA, denaturation and renaturation of DNA, DNA binding proteins, factors affecting DNA stability, DNA Damage & repair, Chemical nature of DNA, Replication of DNA in prokaryotes and eukaryotes, genetic code, degeneracy and universality of genetic code, transcription and translation machinery.

UNIT-II: Human Forensic Genetics and Molecular Biology

Elements of human genetics: Introduction, heritability, human genetic variations, human chromosomes, Mendelian inheritances: Dominant inheritance, recessive inheritance, sex-linked inheritances, polymorphic traits; Heritable human diseases; Metabolic/molecular basis and detection of inherited disease, gene mapping; Genetic markers and their forensic significance. Molecular Biology Techniques: Basic principle of gene cloning and DNA analysis, cloning vectors-Plasmids and Bacteriophages, Genetic Manipulations, Gene cloning, Enzymes used in DNA manipulations- Nucleases, Ligases, polymerases, DNA modifying enzymes, Restriction Enzymes, DNA extraction from Plasmids, bacterial cells and animal cells, DNA sequencing, Gene Libraries construction, Colony Hybridization, Nick translation, Expression of Genes. Gene cloning and DNA analysis in Forensic Science.

UNIT-III: DNA fingerprinting

Biological evidence- Sources collection, characterization and storage; DNA extraction and Quantification; General principles of DNA extraction and quantification; Basic concept of sequence variation-VNTRs, STRs, Mini STRs, SNPs. Detection techniques-RFLP, PCR amplifications, Y- STR, Mitochondrial DNA Evaluation of results, frequency estimate calculations and interpretation, Allele frequency determination, Match probability – Database

UNIT-IV: DNA fingerprinting Methods and its application

STR Profiling: Structure of STR loci; The development of STR multiplexes; Detection of STR polymorphisms; Interpretation of result; Assessment of STR profiles: Stutter peaks. Sp. Pull-up; Degraded DNA; Statistical Assessment of STR profiles; estimating the frequencies of STR profiles. History of DNA profiling applications in disputed paternity cases, child swapping, missing person's

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विभागाध्यक्ष
FSPBTT2
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Learning Outcomes:

1. The students will learn about basic concept of analytical chemistry and spectroscopic techniques and its application in forensic science.
2. They will learn how to separate and analyses the analytes from the crime scene samples.
3. They will learn advance spectrophotometric and microscopy techniques for analysis of the crime scene samples.
4. They will learn modern recombinant DNA technology and its application in forensic science

Recommended Books

1. Sharma, B.R. Scientific Criminal investigation, Universal Law Publishing Co.
2. Eckert W.G. Introduction to Forensic Sciences ,CRC, New York
3. Siegel, J.A., Saukko, P. J. And Knupfer, G.C., Encyclopedia of Forensic Sciences, Academic Publishers, London.
4. John C. Lindon, George E. Tranter & John L. Holmes; Encyclopedia of Spectroscopy & Spectrometry, Academic Press (2000)
5. Cottrell, C.T. Irish, D., Msters VM., and Steward, J.E. (1985) Introduction to ultraviolet and visible spectrophotometry, 2nd ed. Pye Unicam, Cambridge A Practical Guide to Modern NMR for Chemists, OUP, Oxford, 2000
6. Gunther, H., NMR Spectroscopy. Basic Principles, Concepts and Applications in Chemistry, 2nd Edn, Wiley, Chichester, 1995 Davis, R. and Frearson, M. (1987) Mass Spectrometry, Wiley, London Alan Gunn Essential forensic biology Jhon. Wiley
7. Barbara Wheeler Lori J. Wilson, Practical Forensic Microscopy: A Laboratory Manual.
8. Bryan L. William & Keith Wilson; Principles & Techniques of Practical Biochemistry, Harper & Row, New York (1975)
9. Keith Wilson & Keith Wilson; Principles & Techniques of Practical Biochemistry, Cambridge University Press (2004)
10. George M. Malacinski; Essentials of Molecular Biology, 4th Ed. Jones and Bartlet Pub. (2003)
11. W.G. Eckert and R.K. W. Higham; Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (Ed.) (2005)
12. Gardnes & Snustad; Principles of Genetics, 6th Ed. John Wiley & Sons (2005)
13. S.H. James and J. Norby; Forensic Science: An Introduction to Scientific Investigation and Laboratory Techniques, 2nd Edition, CRC Press, Boca Raton (2002)
14. M.K. Bhasin and S. Nath; Role of Forensic Science in the New Millennium, University of Delhi, Delhi, Publishers, New Delhi (2001).
15. B. B. Nanda and R. K. Tiwari; Forensic Science in India: A Vision for the Twenty First Century, Selected Readings

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M.Sc. Forensic Science

Semester - FSPBLT1

Practicals based on Forensic genetics and DNA
profiling
(Lab-3)

Maximum Marks: 100

Allotted credits: 03

1. Extraction and isolation of DNA from body fluid.
2. Extraction and isolation of mitochondrial DNA.
3. Study of DNA-protein interaction study using non-radioactive electrophoretic mobility assay (EMSA)
4. To perform the DNA denaturation and renaturation kinetics.
5. To perform DNA Fragmentation Assay
6. Gender identification using Amelogenin gene PCR amplification.
7. To perform DNA typing using PCR.
8. Detection of Single nucleotide polymorphism in STR alleles.

Learning Outcome

1. Students will be able to learn basic molecular biology techniques and its application.
2. They will learn about offspring inherit genetic traits from their parents, dominant, recessive and sex-linked genes and its mapping.
3. They will be able to learn DNA fingerprint techniques, DNA profile interpretation, evaluation and its application in forensic investigation.
4. In practical aspects they will be able to learn DNA isolation and DNA fingerprinting methods

Recommended Books:

1. Saferstein, Richard, Hand book of forensics cience, Vol.I, II, (Ed.) Prentice hall, Englewood cliffs, NJ;
2. William goodwin, Adrian linaere, Sibtehadi; An Introduction to Forensic Genetics Johnwiley&Son's Ltd, UK.
3. Coyle, H. (Ed.) Non-human DNA typing, International forensic science and investigation series, CRC Press, Bocaraton.

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4. Linacre, A. (Ed.) Forensic science in wildlife investigations, International forensic science and investigation Series, CRC Press, Boca Raton.
5. Bruce Budowle, Steven Schutzer, Roger Breeze and Paul S. Keim Microbial Forensics.
6. Niels Morling, Handbook of Forensic Genetics (Forensic Science and Medicine) Humana Press.
7. John M. Butler Forensic DNA Typing, Second Edition: Biology, Technology, and Genetics of STR Markers Elsevier Academic Press.


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M.Sc. Forensic Science
Semester -II FSPBTT3
Forensic Chemistry & Toxicology
(Core-7)

Maximum Marks: 100

Allotted credits: 03

UNIT I

Forensic chemistry Definition and scope, Introduction to Narcotic drugs, Depressants, stimulants, and Hallucinogens their Active components and method of analysis, Designer Drugs & Anabolic steroids, Analytical methods of analysis of IMFL, Country and Illicit liquor, Denatured spirits and their analysis.

UNIT II

Fire and Arson investigation- Methods of flammable oil residues detection from debris; Detection of adulteration in Petrol and Diesel, edible oils, Examination of chemicals used in trap cases, Analysis of metals in cheating cases, Explosives: Introduction, classification and various methods of analysis of Explosives.

UNIT III

Forensic Toxicology: Definition and scope, Poisons-Definition and Classification. Methods of isolation of poison from Viscera, Collection and Preservation of Viscera and other relevant materials, Analysis of ethyl alcohol and methyl alcohol in biological fluids.

UNIT IV

Extraction methods of poisons from viscera, blood and urine. Isolation and identification of Plant Poisons, opium and its derivatives, Benzodiazepine tranquilizers, Metallic Poison, Insecticides and Pesticides. Basic concepts of Poisonous Mushrooms, Poisonous fungi, Food Poisoning, Common vegetable abortifacients, Animal poison, Snake venom.

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M.Sc. Forensic Science
Semester -II FSPBLT2
Practicals based on Forensic Chemistry and
Toxicology
(Lab-4)

Maximum Marks: 100

Allotted credits: 03

1. Determination of methanol and ethanol in liquor sample.
2. Analysis of narcotic drugs by TLC
3. Determination of Ethanol and Methanol in alcoholic liquors
4. Examination of inorganic acid in partially burnt clothe
5. Detection of adulterant in vegetable oil
6. Identification of opium/ dhatura alkaloids by TLC
7. Identification of poisonous seeds- Ricinus, Croton and Argemone.
8. Analysis of viscera(simulated sample) for Organo Chloro and Organo Phosphorous pesticides

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Course Outcome: By the end of this course student will have basic knowledge forensic chemistry and toxicology. They will learn about various drugs and poisons along with their legal aspects.

Learning Outcomes:

1. Student will able know about basic knowledge of forensic chemistry and toxicology.
2. They will learn about various drugs and their abuse in the society.
3. They will also learn how to investigate an arson case.
4. They will know about various analytical method used for the analysis of petrol, diesel, edible oils and other fuels.
5. They will learn about various poisons, their classification, extraction methods, isolation and their identification.

Recommended Books:

1. Khan, JaVed I., Ho, Mat H. Analytical Methods in Forensic Chemistry. New York:Working Procedure Manua Chemistry/Toxicology/Explosives/Narcotics, DFS Pub. New Delhi
2. Kennedy, Thomas J., Christian, Jr., Donnell Basic Principles of Forensic Chemistry, Springer
3. Saferestein, Criminalistics: An Introduction to Forensic Science. Prentice Hall
4. Maudham.B.et.al; Vogel's Textbook of Quantitative Chemical. Analysis, Longman
5. John D. DeHaan ; Kirk's Fire Investigation, Prentice Hall Eaglewood Cliffs, N.J
6. Yinon J; Modern Methods & Application in Analysis of Explosives, John Wiley.
7. C.A. Watson; Official and standardized Methods of Analysis. Royal Society of Chemistry, UK.
8. Goutam, M. P. and Goutam S Analysis of Plant Poison, Selective & Scientific Books, New Delhi.
9. Feigl; Spot Test in Organic Analysis, Elsevier Pub., New Delhi.
10. Curry A.S; Analytical Methods in Human Toxicology, Part II, CRC Press Ohio
11. Clark, E.G.C.; Isolation and Identification of Drugs, Vol I&II, Academic Press, Sunshine I; Year book of Toxicology, CRC Press Series, USA
12. Michael J. Deverlanko et al: Hand Book of Toxicology CRC Press, USA.
13. Parikh C.K; Text Book of Medical Jurisprudence Forensic Medicines and Toxicology. CBS Pub. New Delhi.

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M.Sc. Forensic Science
Semester –II FSPBTT4
Research methodology and Ethics
(Corc-8)

Maximum Marks: 100

Allotted credits: 03

UNIT- I: Quality Managements

Elements of a Quality Management System: Quality, Total Quality, Quality assurance, Quality control Quality system. Quality Planning, Quality Audit: Internal and External Audit & MRM, History and development of ISO, Terminology of NABL. Benefits of ISO9000 series of standards. ISO9001 Requirements.

UNIT –II: Sampling

Sampling: sampling procedures (random and non-random), sampling statistics, Physical state, homogenization, size and hazards in sampling, Significance of statistics in forensic science. Basic concepts of frequency distribution, measure of central values - Mean, median and mode, measures of dispersion, Range, Mean deviation and standard deviation, Correlation and Regression analysis. Probability- Definition, Theory, Classical and types.


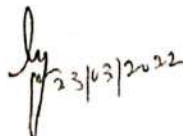
UNIT- III: Research Methods

Meaning of research Problem: Research, definition, Objectives of research. Types of research-From the view point of application, Objectives, Inquiry mode. Search for existing literature, hypothesis, Interpretation and report writing.

UNIT- IV: Research Ethics

Introduction to philosophy: definition, nature and scope, concept, branches. Ethics: definition, moral philosophy, nature of moral judgements and reactions Ethics with respect to science and research, Intellectual honesty and research integrity, Scientific misconducts: Falsification, Fabrication" and Plagiarism (FFP), Redundant publications: duplicate and overlapping publications, salami slicing, Selective reporting and misrepresentation of data.

Learning outcome:

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1. Students will learn about quality and accreditation of standards.
2. They will learn about basic methods of sampling and its statistical analysis.
3. They will learn about how to define research problem and implementation.
4. They will also learn scientific research honesty and ethics.

Recommended Books:

1. ISO/IEC/17025:2005, NABL NABL -113, NABL -113A, 131, guidelines of NABL.
2. International Standard on General requirements for the competence of testing and calibration laboratories, 1st Ed., 1999-12-15, ISO/IEC 17025:1999(E). C.G.G.
3. Kothari, C.R. Research Methodology Methods and Techniques. Wiley Eastern Limited, New Delhi.
4. Saferstein R. Forensic Science Handbook I, II, III.
5. William L. Duncan: Total Quality, Key Terms and Concepts.
6. Murray S. Cooper: Quality control in the Pharmaceutical Industry.
7. John T. Rabbitt, Peter A Bergh: The ISO 9000 Book.
8. Willard Merritt, Dean & Settle: Instrumental Methods of Analysis.
9. Jami St. Clair Crime Laboratory Management: Academic Press.
10. Thomas A the Laboratory Quality Assurance system: A manual of Quality Procedures and forms.
11. Ratliff. 2003 3rd ed. John Wiley & Sons.
12. Gary B Clark Systematic Quality Management. Practical Laboratory Management Series.

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M.Sc. Forensic Science

Semester -II FSPBTD1

Forensic Psychiatry

(Elective-1)

Maximum Marks: 100

Allotted credits: 03

Introduction to forensic Psychology, Historical Perspective- Indian and Global concern, Roles of Forensic psychology and forensic Psychologist, Introduction to crime, elements of crime, Modus Operandi, Classification of Crime, Types of Crime- Economic crime, organized crime, white collar crime, Crime against women, Juvenile delinquency etc.

UNIT II-

Theories of criminal offences -Theories of Criminal behavior- Biological, Physiological, Economical, Sociological, etc. Theories of punishment (Deterrent, Retributive and Reformative). Criminal profiling, Deductive and Inductive Profiling.

UNIT III -

Legal Aspect in Forensic Psychology, Mental Health Act 1987, Human Rights of mentally ill person, Competency to stand trial, insanity defence, relevant sections of IPC, Correctional measures- rehabilitation of mentally ill, correctional home.

UNIT IV-

Assessment and Evaluation- Clinical Interviews, Mental status Examination, Psychological test, personality test, Intelligence test, Aptitude test etc. Therapeutic approaches - type of therapies (cognitive behavioural therapy ,Psychodynamic, Humanistic etc)Tools used in Forensic Psychology- Polygraph , Narco-analysis, Brain mapping, Hypnosis, Psychological autopsy

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M.Sc. Forensic Science
Semester –II FSPBLD1
Practicals based on Forensic Psychiatry
(Lab-5)

Maximum Marks: 100

Allotted credits: 03

1. To cite a criminal case in which narco analysis was used as a means to detect deception.
2. To review a crime case involving serial murders. Comment on the psychological traits of the accused.
3. To study a criminal case in which hypnosis was used as a means to detect deception.
4. Assessment of intelligence through inventories.
5. Assessment of mental status through interviews.
6. Assessment of personality using EPI.
7. Assessment of personality using MMPI.
8. To prepare a report on relationship between mental disorders and forensic psychology.

Course Outcome: By the end of this course student will know about basics of forensic psychology and its application the court of law. They will also know about various tests performed for assessment and evaluation of mental status.

Learning Outcomes:

1. The students will able to learn about basics of crime, their element and classification.
2. They will know about various theories of criminal offences.
3. They will also know about legal aspects of forensic psychology.
4. They will learn about various tests performed for the evaluation and assessment of mental status of a criminal.

Suggested Readings

1. A.A. Moenssens, J. Starrs, C.E. Henderson and F.E. Inbau, Scientific Evidence in Civil and Criminal Cases, 4th Edition, The Foundation Press, Inc., New York (1995).
2. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).

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3. J.C. DeLadurantey and D.R. Sullivan, Criminal Investigation Standards, Harper & Row, New York (1980).
4. J. Niehaus, Investigative Forensic Hypnosis, CRC Press, Boca Raton (1999).
5. E. Elaad in Encyclopedia of Forensic Science, Volume 2, J.A. Siegel, P.J. Saukko and G.C. Knupfer (Eds.), Academic Press, London (2000).
6. Psychology-An Introduction, Thakkar P., Dr. Ambekar A.,
7. Introduction to Psychology, (1986) Morgan C.T., King R.A., Weisz J.R., Schopler J., McGraw-Hill Book Co.
8. Psychological Interventions of Mental Disorders', S. K. Shrivastava, Nayanika Singh, Shivani Kant, Edition 1st, 2013, Sarup Book Publishers, PVT. LTD.
9. 'Forensic Criminology', Petherick W. A., Turvey B. E., Ferguson C. E., [2010], Elsevier Inc.

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M.Sc. Forensic Science

Semester -II FSPBTD2

Wildlife Forensics and Forensic Entomology

(Elective-2)

Maximum Marks: 100

Allotted credits: 03

Unit I

Wildlife ecology, Definition of wildlife, free living, domestic, captive and feral animals, wildlife conservation and its importance, Zoographic regions and biomes of India, Uniqueness of Indian biodiversity, reason and causes of wildlife depletion, rare, threatened and endangered species of India.

Unit II

Introduction to Wildlife Crimes and its types, Investigation of a wildlife crime scene, Different methods of killing and poaching of wildlife animals, Techniques of Species identification, types of wildlife evidences, wildlife artefacts, tools and techniques of wildlife crime investigation.

Unit III

Illegal wildlife trade, Identification of pug marks of different animals, Wildlife Protection Act, 1972, Introduction to Wildlife conservation agencies-WWF, IUCN, CITES, WCCB, Wildlife conservation society, Defenders of Wildlife, Biglite Foundation, International fund for Animal welfare, National wildlife federation, Red Data Book, TRAFFIC.

Unit IV

Definition, nature and scope of Forensic entomology. Types of forensic insects, collection of entomological evidence, Insect succession, molecular methods for forensic entomology. Life cycle of Insects.

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M.Sc. Forensic Science

Semester -II FSPBLD2

Practicals based on Wildlife Forensics and Entomology

(Lab-6)

Maximum Marks: 100

Allotted credits: 03

- 1.To perform collection and preservation of entomological evidence
- 2.To study the lifecycle of different insect families.
- 3.To perform microscopic examination of hair of wildlife species.
- 4.To prepare the report of wildlife crime investigation.
- 5.To study the cases related to wildlife crimes in Indian scenario.

Course Outcome: By the end of this course students will have basic knowledge of wildlife and their application in the field of Forensic Science.

Learning Outcomes:

1. The students will learn about wildlife ecology, their conservation and their importance.
2. They will know about wildlife crimes and the investigation of wildlife crime scene.
3. They will learn about illegal trading and poaching of wild flora and fauna.
4. They will also have knowledge of various insects and their forensic application.

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M.Sc. Forensic Science

Semester -II FSPBST1

Seminar

Maximum Marks: 50

Allotted credits: 02

Seminar based on Recent trends in Research related to topics taught in current Semester.

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