

*Institute for Excellence in Higher Education (IEHE),
Bhopal*

Department of Forensic Science & Chemistry

Syllabus 2018-2019

B.Sc Forensic Science Honour Chemistry Subsidiary

Institute for Excellence in Higher Education (IEHE), Bhopal

Board of Studies Forensic Science
Abstract of Syllabus

Date & Time of Meeting

Session 2018-2019

B.Sc Forensic science (Honours) subsidiary (chemistry)

Semester: I, II

S. No	Semester	Paper	Paper Title (Theory)	Paper Title (Practical)
1	I	Honours I	Forensic Dermatology & Questioned Document	Forensic Dermatology & Questioned Document
2	I	Honours II (subsidiary)	Introduction of Forensic Science	Crime Scene Management
3	II	Honours I	Criminalistic	Criminalistic
4	II	Honours II (subsidiary)	Forensic chemistry, Forensic Toxicology and Technological Methods	Forensic chemistry, Forensic toxicology



Institute for Excellence in Higher Education (IEHE), Bhopal

Board of Studies Forensic Science
Abstract of Syllabus

Date & Time of Meeting

Session 2018-2019

B.Sc Chemistry (Honours) Forensic science (subsidiary)

Semester: I, II

S.No	Semester	Paper	Paper Title (Theory)	Paper Title (Practical)
1	I	Subsidiary I	Introduction to forensic science	Crime scene Management
2	II	Subsidiary I	Forensic chemistry, Forensic Toxicology and Technological methods	Forensic Chemistry, Forensic Toxicology

SYLLABUS

Unit 1: Basics of Fingerprinting

Introduction and history, with special reference to India.

Biological basis of fingerprints. Formation of ridges. Fundamental principles of fingerprinting. Types of fingerprints. Fingerprint patterns. Fingerprint characters/minutiae. Plain and rolled fingerprints.

Classification and cataloguing of fingerprint record. Automated Fingerprint Identification System. Significance of poroscopy and edgeoscopy.

Unit 2: Development of Fingerprints

Latent prints. Constituents of sweat residue.

Latent fingerprints' detection by physical and chemical techniques.

Mechanism of detection of fingerprints by different developing reagents.

Application of light sources in fingerprint detection.

Preservation of developed fingerprints.

Digital imaging for fingerprint enhancement.

Unit 3: Other Impressions

Importance of footprints. Casting of foot prints, Electrostatic lifting of latent foot prints. Palm prints. Lip prints - Nature, location, collection and examination of lip prints. Ear prints and their significance. Palm prints and their historical importance.

Unit-4: Nature and Scope of Questioned Documents

Definition of questioned documents. Types of questioned documents. Preliminary examination of documents. Basic tools needed for forensic documents' examination – ultraviolet, visible, infrared and fluorescence spectroscopy, photomicrography, microphotography, visible spectral comparator, electrostatic detection apparatus. Determining the age and relative age of documents.

Unit- 5: Comparison of Documents

Comparison of handwriting. Development of individuality in handwriting. Natural variations and fundamental divergences in handwritings. Class and individual characteristics. Merits and demerits of exemplar and non-exemplar samples during comparison of handwriting. Standards for comparison of handwriting. Comparison of paper, ink, printed documents, typed documents, Xeroxed documents

Dr. Devashree Bose. — F 2000/

Dr. Rajendra Varma —

Dr. Nidhi Shrivastava — sat

Dr. Vinay Mishra. — Sagar.

Dr. Nakjot Kaur — Sagar.

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Kit

Kit / Docu / UV lamp.

PRACTICAL

1. To record plain and rolled fingerprints.
2. To carry out ten-digit classification of fingerprints.
3. To identify different fingerprint patterns.
4. To identify core and delta.
5. To carry out ridge tracing and ridge counting.
6. To investigate physical methods of fingerprint detection.
7. To investigate chemical methods of fingerprint detection.
8. To use different light sources for enhancing developed fingerprints.
9. To prepare cast of foot prints.

Suggested Readings:

1. J.E. Cowger, Friction Ridge Skin, CRC Press, Boca Raton (1983).
2. D.A. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis, CRC Press, Boca Raton (2000).
3. C. Champod, C. Lennard, P. Margot an M. Stoilovic, Fingerprints and other Ridge Skin Impressions, CRC Press, Boca Raton (2004).
4. Lee and Gaensleen's, Advances in Fingerprint Technology, 3rd Edition, R.S. Ramotowski (Ed.), CRC Press, Boca Raton (2013).

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SYLLABUS

Unit- I- Introduction to Forensic Science

Definition & historical development of forensic science in India as well as abroad, role of basic science in forensic science, need of forensic science, function of forensic science, basic principle of forensic science, **ethics in forensic science**, Forensic Scientist and the functions of a Forensic Scientist.

Unit- II- Branch and scope in Forensic Science

Branches of forensic science, **Application of forensic science in different sectors** i.e. Governmental, Private and NGO's, Forensic science in international perspectives Code of conduct for forensic scientists

Unit- III Organizational set up of Forensic Science Laboratories –

Introduction of forensic science laboratories, set up of Central Forensic Science Laboratories, state of forensic science laboratories, Mobile unit, examiners of questioned document, Fingerprint Bureaus, police academies, other services.

Unit- IV Elementary police science

Police science: definition and scope, investigator and his qualities, interview of witness, interrogation of suspect, Investigation: FIR, Case diary, Cognizable and non-cognizable offences and their investigation.

Unit V Scene of crime

Introduction and definition of scene of crime, classification of scene of crime, security of scene of crime, first responding officer at the scene of crime, duties of first responding officer, coordination between police personals and forensic scientists at crime scene, safety measures at crime scene, **legal considerations at crime scenes.**

References:

1. **Safer stein: Criminalistics – An Introduction to Forensic Science, Prentice hall Inc. USA 91995)**
2. **C.G.G. Aitken and D.A. Stoney; The use of statistics in Forensic Science, Ellis Harwood Limited, England (1991)**
3. **James, S.H. and Nord by, J.J.; Forensic Science; an Introduction to Scientific and Investigative Techniques, CRC Press, USA (2003)**
4. **O' Hara & Osterberg : An Introduction to Criminalistics.**
5. **Forest: Forensic Science, An Introduction.**
6. **Lee, Henry: Advances in Forensic Science.**
7. **Sharma J D: Vidhivigyan Avem Vish Vigya.**
8. **Sharma J D: Apradh ka Vigyanik Anveshan.**
9. **Sharma B R: Forensic Science in Criminal Investigation and trials.**



TITLE: CRIMINALISTICS PRACTICAL

Max. Marks: 100

1. Report writing ^{of Case by IO i.e} ~~scene of crime~~ F.I.R, ^{packing} Case Diary, Roznamacha
2. Collection, preservation & Labelling of physical evidence according to its nature like blood, saliva, soil, glass fracture piece etc.
3. Writing of forwarding ^{of the above mentioned} letter of physical evidence ^{to} for forensic examination in F.S.L

(a) of physical origin

(i) (ii) (iii)

(b) of biological origin

(c) of chemical origin

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SUBJECT: FORENSIC SCIENCE

PAPER: Honours-II(subsi)

TITLE: FORENSIC CHEMISTRY, FORENSIC TOXICOLOGY & TECHNOLOGICAL METHODS

Max. Marks: 100

SYLLABUS

Unit 1: Basics of Toxicology

Significance of toxicological findings. Techniques used in toxicology. Toxicological analysis and chemical intoxication tests.

Postmortem Toxicology. Human performance toxicology.

Dose-response relationship. Lethal dose 50 and effective dose 50.

Unit 2: Poisons

Classification of poisons. Physio-chemical characteristics and mode of action of poisons. Accidental, suicidal and homicidal poisonings.

Signs and symptoms of common poisoning and their antidotes. Collection and preservation of viscera, blood and urine for various poison cases.

Animal poisons. Snake venom. Mode of action. Carbon monoxide poisoning.

Vegetable poisons. Poisonous seeds, fruits, roots and mushrooms.

Beverages. Alcoholic and non-alcoholic illicit liquors. Analysis and identification of ethyl alcohol.

Unit 3: Petroleum and Petroleum Products

Distillation and fractionation of petroleum. Commercial uses of different petroleum fractions.

Analysis of petroleum products.

Analysis of traces of petroleum products in forensic exhibits.

Comparison of petroleum products. Adulteration of petroleum products.

Unit 4: Cases Involving Arson

Chemistry of fire. Conditions for fire. Fire scene patterns. Location of point of ignition. Recognition of type of fire. Searching the fire scene. Collection and preservation of arson evidence.

Analysis of fire debris. Analysis of ignitable liquid residue. Post-flashover burning.

Scientific investigation and evaluation of clue materials. Information from smoke staining.

Unit 5: Instrumentation

Sample preparation for chromatographic and spectroscopic evidence.

Chromatographic methods. Fundamental principles and forensic applications of thin layer chromatography, gas chromatography and liquid chromatography.

Spectroscopic methods. Fundamental principles and forensic applications of Ultraviolet-visible spectroscopy, infrared spectroscopy, atomic absorption spectroscopy, atomic emission spectroscopy and mass spectroscopy. X-ray spectrometry. Electrophoresis – fundamental principles and forensic applications.

Neutron activation analysis – fundamental principles and forensic applications.

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SUBJECT: FORENSIC SCIENCE

PAPER: HONOURS-II (Sub)

TITLE: FORENSIC CHEMISTRY & FORENSIC TOXICOLOGY

Max. Marks: 100

PRACTICAL

1. To identify biocides.
2. To identify metallic poisons.
3. To identify organic poisons.
4. To identify ethyl alcohol.
5. To identify methyl alcohol.
6. To carry out quantitative estimation of ethyl alcohol.
7. To prepare iodoform.
8. To identify drugs of abuse by spot tests.
9. To perform color tests for barbiturates.
10. To separate drugs of abuse by thin layer chromatography.

Suggested Readings

1. R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).
2. F.G. Hofmann, A Handbook on Drug and Alcohol Abuse, 2nd Edition, Oxford University Press, New York (1983).
3. S.B. Karch, The Pathology of Drug Abuse, CRC Press, Boca Raton (1996).
4. A. Poklis, Forensic toxicology in, Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (Ed.), CRC Press, Boca Raton (1997).
5. A.W. Jones, Enforcement of drink-driving laws by use of per se legal alcohol limits: Blood and/or breath concentration as evidence of impairment, Alcohol, Drug and Driving, 4, 99 (1988).
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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