



DEPARTMENT OF FORENSIC SCIENCE

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About the Department

Forensic science has acquired worldwide acceptance and recognition as the most reliable investigating technique in crime detection. The demand for forensic scientists is growing day by day not only due to the spiraling crime rate that is gripping the urban areas but also due to the fact that the criminals are increasingly using more innovative and high tech methods in their activities. The traditional methods of investigations have become quite ineffective in these circumstances. The technically sophisticated methods developed by the forensic science are the most effective tools for investigations in such cases. In spite of the fact that such techniques are available, severe shortage of trained professionals in this area has become a major problem in crime investigations.

Keeping these aspects in view, Gujarat University under the visionary leadership of the Vice-chancellor Dr.Parimal H. Trivedi started a post graduate course in forensic science in collaboration with DFS, Gandhinagar which was



inaugurated on the 21st of August 2006. Gujarat University is the first one In the western region to offer such a highly professional and specialized course The post graduate course in forensic science, which was started in a room of Chemistry Department, has grown into a fully fledged department within a span of 5 years, with almost all high tech facilities required for the programme and the course has become the most sought after course of Gujarat University.

Courses offered by the department

1. Ph.D
2. M.Sc (Forensic Science)
3. Certificate courses
 - Criminology and forensic science
 - Questioned document and Handwriting Examination
 - Fingerprint and Impression Examination
 - Forensic Medicine and Toxicology
 - Forensic Accounting and Financial Frauds
 - Private Investigator/ Detective

Facilities

Department of Forensic Science is having well equipped laboratories having even a highly sophisticated Video Spectral Comparator (VSC-6000) and Polygraph (Lie-detector).



POLYGRAPH (LIE DETECTOR)



VSC-6000

The other instrumental facilities are UV-Vis Spectrometer, Comparison Microscope (for bullet comparison), Fourier transform infrared spectroscopy, Gas chromatography, ESDA for indented writing examination all sophisticated microscopes and crime scene investigation kits for the evidence collection and investigation to provide real time investigation experience to the students as used by renowned investigating agencies in India.

The department is having good library facilities with more than 1000 books on different disciplines of forensic science and law.



Achievements

Within this short period of time the department has achieved remarkable landmarks in the field of forensic science education in Gujarat. Among the four batches passed out 2008 to 2011 (comprising 20 each), **27** students successfully qualified University Grand commission National Eligibility Test for Lectureship in Forensic Science. “The course has become very popular throughout the country due to the large number of students clearing the NET examination in their first attempt”. Special coaching is given to students on holidays and Sundays for this purpose. **7** students have also qualified Junior Research fellowship(JRF) along with lectureship, who are now pursuing their Ph. D in the department. A total of **8 Ph. D** students are working in the department. Department has also organized a National Seminar on Emerging Trends in Forensic Science during 27 & 28th April 2008.

Riddhi Bhatt, a M. Sc. Forensic Science student won the prestigious **GOLDEN PEACOCK AWARD** in 2010-2011.

Project Work and Research activities

Department is actively involved in research in topics from the thrust areas of forensic science. Many small research projects along with full fledged research as doctoral programme (Ph.D) is carried out in the department.

Following are the areas of research work being carried out in the department, by the Ph.D. students and M.Sc. students.

Detection of pesticides by Calix [4] arene customized gold Nanoparticles in water, soil and plant materials, Rapid detection of Explosives by Curcumin nanoparticles as a green tool, Forensic analysis of images captured by different mobile phones, Forensic analysis of Network security technology and LAN, Examination and data collection of different types of ball point ink using TLC and FT-IR, Study of various insurance frauds and their investigating in detective parameters, Forensic examination of genuine signatures for natural variation and forged signatures for differences, Examination of artificially aged paper in forged documents, Age determination of ball point and gel pen inks using U.V.-Visible spectroscopy, Forensic documentation- Fax copy examination, Methods development for enhancing Latent Fingerprint, New Method for the comparison of fingerprints by graphical representation, Examination of Paw print of leopards using Pugmark casts obtained in Sukkarbaug Zoo, Junagadh, Examination of Herbivore teeth for identification and age determination, Study of wild cervidae and bovidae hair for wild life crime investigations, Characterization of keratin protein of feathers using FTIR-ATR, Study of feline hair for wild life crime investigation, Studies on Lion, Panther and Tiger nails using a morphometric method

Age determination by the study of Epiphyseal fusion of Iliac crest in Gujarat Natives, Determination of stature from head length of people of Gujarati Origin, Determination of stature by long bones in Gujarati population by using radiographs, Determination of stature from foot length of people of Gujarati origin, Stature determination from hand length of Gujarat Origin, Determination of cephalic index in Gujarat population

Heavy metal transformation via industrial effluent, Detection and analysis of toxic metals from roadside plants, Detection of heavy metals and adulterants in tea sample collected from different regions of Gujarat, Persistent organochlorine pesticide residue in Sabarmati river, A study of polychlorinated Biphenyls in drinking water of Gujarat, India, Determination of adulteration in Milk, Adulteration and contamination of Ayurvedic Herbal medicines, Determination of adulteration in milk by chemical methods from standard and sub-standard dairies and local retail milk vendors of Ahmedabad, Adulteration in Spices, Ghee and Honey, Detection of adulteration of ground nut oil and mustard oil,

Comparative study of plasma and erythrocyte cholinesterase level as a marker for organophosphorous poisoning, Analysis of Pyrethroids in mosquito mat and spray by different analytical technique, Enhancing the role of chemical analysis in detecting cases of suspected poisoning deaths, Detection of Benzodiazepines in urine by U.V.-visible scanning, Study of variation in life cycle of blow fly due to Baygon, Trends of suicidal poisoning and abuse of insecticides,

Changes in the level of Enzymes & Electrolytes and their co-relation with Time since Death, Determination of postmortem interval using cardiac protein Troponin, Examination of age of dried blood stain by U.V.- Visible spectroscopy

Study of diatoms and their role in drowning cases, Study of Diatoms of Sarkej Roza lake for medicolegal investigations, Diatoms of Kankaria Lake and the role of Diatoms in medicolegal Investigations, Study of Diatoms of Dev Sarovar and their role in drowning cases, Effects of aging on biochemical and serological characteristics of human seminal stains, Determination of sequence differentiation by physical mapping with RFLP method, New FT-IR spectroscopic method for the assay of Semen, Caliber of fragmented bullets, Forensic analysis of fire and arson debris



COURSES OFFERED

Gujarat University offers courses at Degree and certificate level.

(1) M.Sc Forensic Science

(2) Certificate courses

- > Criminology and Forensic Science
- > Questioned documents and handwriting Examination
- > Fingerprint and Impression examination
- > Forensic Medicine and Toxicology
- > Forensic Photography
- > Forensic Accounting and Financial Fraud Examination
- > Private Investigator/ Detective

About the Department


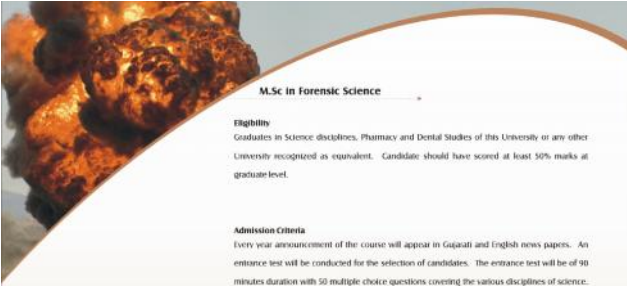
The department of forensic science was established 4 years back in 2006 which was the first centre in Gujarat for forensic science education and also the first centre offering M. Sc. Forensic Science in western part of the our country. Within this short period of time the department has set several land marks in the field of forensic science education in Gujarat.

The programme is unique in the sense that the theoretical and practical aspects of course is covered by an excellent team of academicians and experts comprising of renowned faculty of university at the level of directors, head of the departments, senior professors and retired experienced experts from forensic science laboratory of Gujarat. They have been able to share their rich experience and finer points in crime investigation which have been very well received by the students.

About the Courses

Forensic science is primarily concerned with the application of scientific principles for the investigation of crime. It is a science for the acquisition and analysis of scientific data for application to the study and resolution of crime, investigation, civil and regulatory issues, and criminal identification. With the help of latest technology, forensic scientists convert the clues collected from a crime scene into evidence admissible in a court of law. The evidences might include traces of blood, saliva, other body fluids, hair, fingerprints, footwear and tyre impressions, explosives, specimens of tissue for poisons, blood and urine for alcohol etc. Their expertise lies in the determination of facts using these evidences. It is the use or application of science in courts or in legal proceedings.

Opportunities for forensic scientists exist in government organizations such as FSI, CSI, the Intelligence Bureau (IB), the Central Bureau of Investigation (CBI), the CID, the Central Police Organization (CPO), the crime cells of state police forces as well as in large private detective agencies. They can also work as teachers in institutes that conduct courses in this subject. The students can also set up their own forensic laboratories. The prospects for forensic scientists are increasing in the private sector too. Corporate houses are likely to hire forensic experts in a big way in future owing to the growing incidence of white-collar crimes, frauds and scams. The courses in Forensic Science are designed to cater the needs of research, technology development and applications in the fields of Forensic Science and criminology. Since the requirement of experts in criminology and forensic science will continue to rise, career prospects are also bright with law enforcement agencies, police, legal system and in the investigative service of the government and also with private agencies.

M.Sc in Forensic Science

Eligibility

Graduates in Science disciplines, Pharmacy and Dental Studies of this University or any other University recognized as equivalent. Candidate should have scored at least 50% marks at graduate level.

Admission Criteria

Every year announcement of the course will appear in Gujarati and English news papers. An entrance test will be conducted for the selection of candidates. The entrance test will be of 90 minutes duration with 50 multiple choice questions covering the various disciplines of science. The merit list will have 40% weightage for test marks +60% of B.Sc. Marks.

Intake Capacity

25 students will be admitted every year. Out of 25 seats, 17 seats are reserved for Gujarat University students and 8 seats are for students other than the Gujarat University with maximum 5 seats for NRI/Special payment seats meeting the eligibility criteria. If there are no candidates for NRI/Special payment seat, these 5 seats will be opened for general category. Reservation of seats for candidates belonging to SC/ST/SBC/PH etc. as per rules of the Gujarat University.

Fee structure

The course will be fully self financed. Fee structure is as follows:
 General Seats (20) Rs. 15,000/- per semester per student
 NRI/ Special Payment Seats (5) Rs. 50,000/- per semester per student
 Examination fees of Rs. 500/- per semester will be collected along with the examination form. The convocation fee will be charged as per university rules. (Fees once paid shall not be refunded under any circumstances.)

Course structure

The medium of teaching will be English. The two-year post graduate course consists of four semesters. In the first, second and third semester there will be 4 theory papers in each semester of 100 marks. First, second and third semesters will have two practicals in each semester. The total marks in first, second and third semester will be 600 each. The fourth semester will have only project work and carries 400 marks. Grand total of marks will be 2400.



Scheme of Examination

Semester examinations will be held in the month of December and June every year. The following will be the scheme of examination.

First Semester

Theory Papers	Course Credits	External Marks	Internal Marks
FS101 Forensics, crime investigative techniques and crime scene management	4	70	30
FS102 Instrumental methods - physical	4	70	30
FS103 Instrumental methods - biological and chemical	4	70	30
FS104 Forensic ballistics and photography	4	70	30
Practicals			
FS105 PR Instrumental methods - physical, chemical and biological	4	70	30
FS106 PR Forensic ballistics, photography and crime scene management	4	70	30
TOTAL	24	420	180

Second Semester

Theory Papers	Course Credits	External Marks	Internal Marks
FS107 Fingerprint	4	70	30
FS108 Questioned documents	4	70	30
FS109 Forensic chemistry and explosives	4	70	30
FS110 Forensic toxicology and pharmacology	4	70	30
Practicals			
FS111 PR Questioned documents, finger prints	4	70	30
FS112 PR Forensic chemistry and toxicology	4	70	30
TOTAL	24	420	180

Third Semester

Theory Papers	Course Credits	External Marks	Internal Marks
FS201 Forensic physics	4	70	30
FS202 Forensic biology, serology and DNA profiling	4	70	30
FS 203 Forensic Medicine and Anthropology	4	70	30
FS 204 Recent advances, quality management and evidence evaluation	4	70	30
Practicals			
FS 205 PR Forensic physics	4	70	30
FS 206 PR Forensic biology, serology and DNA profiling, Forensic medicine and anthropology	4	70	30
TOTAL	24	420	180

Fourth Semester

	Course Credits	Marks
FS301 PT Attachment FSU/ CFSU/CBI/GEQD	8	200
Disertation	16	400
Total	24	600

GRAND TOTAL (I-II-III-IV SEMESTERS)
COURSE CREDITS = 96, TOTAL MARKS = 2400



Evaluation
The distribution of marks for theory papers shall be as follows:
External- 70% Internal- 30%
External marks for theory papers will be awarded based on examination conducted by University at the end of each semester and the internal marks will be based on the two tests conducted by the subject teacher in charge. Of the 100 marks of each practicum 75 marks will be for the experiment, viva-voce, attendance and for record and 50 marks for seminar, quiz and assignments. For the project 70% of mark will be based on viva-voce at the end of the project and 30% mark will be based on the assessment by project guide. AITK system shall be followed where the students will be allowed to keep the terms till the 4th semester. i.e. students can carry forward their AITK till the 4th semester.

Examination passing standard and award of the class as per the Gujarat University rules.

Pattern of Question Paper
- There will be four units of equal weightage in each theory paper. Each theory paper will have three sections. Section 1 will have 10 objective type questions, each carrying 1 mark. Section 2 will have 8 questions out of which 6 have to be answered each carrying 5 marks. Section 3 will have two descriptive questions each with internal choice each carrying 15 marks.

CERTIFICATE COURSES


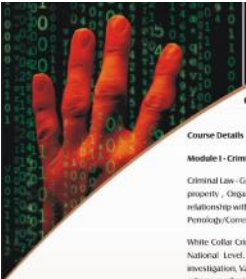
Eligibility
Graduate from any discipline of this university or any other university recognized as equivalent.

Duration
6 Months

Intake capacity
40 seats

Fees Structure
Rs 15,000/- per student.

Course structure
The medium of teaching will be English. The six months certificate course consists of two modules. Each module comprises of two theory papers. Total marks in Module I and Module II will be 400 (100marks each paper).

CERTIFICATE COURSE IN CRIMINOLOGY AND FORENSIC SCIENCE

Course Details

Module I- Criminology and Penology
Criminal Law- General Exceptions, & Explanations under the Indian Penal Code, offences against Human body and property, Organisation set-up of Criminal Courts in India, Definitions, scope and objective of Criminology, Its relationship with Sociology, Psychology, Anthropology, Forensic Science, Penology, Law Theories of Criminology, Penology/Correction, Punishment: Definitions theories, functions and types, Victimology.
White Collar Crimes, Scientific Investigation and penal justice system, Police Organisation at District, State and National Level, Qualities of successful investigator, First Information Report, Pros and cons of scientific investigation, various kinds of scientific investigation, Scientific investigation and human rights, Admissibility and relevance of scientific investigation in criminal cases, Types of evidences admissions and confessions and expert evidences.

Module II: Forensic Science
Forensic Science: Definition and scope, Meaning and historical development of Forensic science and its role in crime detection, Organisation of Forensic Science Laboratories.
Crime scene management, Fingerprints, Documents, Forensic Ballistics
Investigation in Cognizable offences: Burglary, Murder, Hit and run cases, Elementary idea of examinations and analysis of blood, Semen, Soil, glass, paint, ink, hair, Foot prints: Types, lifting of smudged footprints, tracing of surface footprints and walking picture, Forensic psychology: Narco-analysis, Lie-detection, Brain finger printing & forensic hypnosis, Death: ii Modes iii Signs iii Changes after death, Different types of wounds and their characteristics, Concept of normal and abnormal behaviour, ii Mental Mechanism and criminal behaviour iii Mental Disorders and Mental deficiency in relation to criminal behaviour, iii Psychopathic personality, Poisons and narcotic drugs

QUESTION DOCUMENTS AND HANDWRITING EXAMINATION

Module I
Introduction to Question Documents, handwriting identification, disguised writing and anonymous letters, examination of signature characteristics of genuine and forged signature examination of alterations, erasures, overwriting, addition and obliterations, decipherment of secret, indented and charred documents, examination of sealed impressions and other mechanical impressions, photography of questioned documents.

Module II
Examination of black and white, colour Xeroxed copies, carbon copies, fax messages, various types of forgeries and their detection, various types of printing security documents, currency notes, credit cards, passport, visa, stamp papers and postal stamps, identification of type writings, Graphology, Examination of computer printouts, identification of dot-matrix, ink-jet and laser printers, electronic typewriter, forensic stylitics, forensic linguistics, opinion writing and reason for opinion.

FINGERPRINT & IMPRESSION EXAMINATION

Module I
History and development of fingerprint, formation of ridges, pattern types, pattern areas, ridge tracing, ridge counting, taking of fingerprints and palm prints from living and dead person, post mortem fingerprinting, Preserving and lifting of fingerprints, photographs of fingerprints forgeries of fingerprints, comparison of fingerprints, periscope, edgescopes, AFS, Classification of fingerprint for comparison purpose, Henry system of classification, single digit classification, extension of Henry system, search of fingerprints.

Module II
Chance fingerprints, latent and visible fingerprints, plastic fingerprints, composition of sweat, development of latent fingerprints, conventional methods of developments of fingerprints, digital imaging and enhancement, Foot prints, tool marks, Tire marks/ Prints and skid marks, Lip print, Bite marks examination.

