COURSE STRUCTURE

FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits	Page No.
MFS 101	Criminology, Criminal Law, Police Administration	2	1	-	3	
MFS 102	Crime Scene Investigation (CSI)	2	1	-	3	
MFS 103	Forensic Physics	2	1	-	3	
MFS 104	Cyber Forensics & Computer Applications	2	1	-	3	
MFS 105	General Forensic Science	2	1	-	3	
MFS 141	Communication Skills - I	1	-	-	1	
MFS 143	Behavioural Science - I	1	-	-	1	
MFS 144 MFS 145 MFS 146 MFS 147 MFS 148	Foreign Language - I French German Spanish Japanese Chinese	2	-	-	2	
MFS 120	Practicals on Forensic Physics & CSI	2	-	4	4	
MFS 121	Practicals on General Forensic Science	2	-	4	4	
	TOTAL				**27**	

SECOND SEMESTER

MFS 201	Forensic Photography	2	1	-	3	
MFS 202	Elements of Forensic Medicine, Odontology & Psychiatry	2	1	-	3	
MFS 203	Principles of Human Genetics	2	1	-	3	
MFS 204	Forensic Linguistics & Phonetics	2	1	-	3	
MFS 205	Forensic Aspects in Sports	2	1	-	3	
MFS 241	Communication Skills - II	1	-	-	1	
MFS 243	Behavioural Science - II	1	-	-	1	
MFS 244 MFS 245 MFS 246 MFS 247 MFS 248	Foreign Language - II French German Spanish Japanese Chinese	2	-	-	2	
MFS 220	Practical on Forensic Medicine & Odontology	2	-	4	4	
MFS 221	Practical on Forensic Photography	2	-	4	4	
	TOTAL				**27**	

SUMMER ASSIGNMENT 4 TO 5 WEEKS

THIRD SEMESTER

MFS 301	Instrumental Analysis	3	1	-	4	
MFS 302	Statistics & Research Methodology	3	1	-	4	
MFS 341	Communication Skills - III	1	-	-	1	
MFS 343	Behavioural Science - III	1	-	-	1	
MFS 344 MFS 345 MFS 346 MFS 347 MFS 348	Foreign Language – III French German Spanish Japanese Chinese	2	-	-	2	
MFS 360	Summer Assignment (Evaluation)	-	-	-	2	
MFS 350	Internship (2 Weeks) - I	-	-	-	2	

Electives: Select any one Specialization from the following:						
Specialization in Forensic Biology and Serology						
MFS 303	Cell Biology, Anatomy, Physiology & Biochemistry	3	1	-	4	
MFS 304	Forensic Biology	3	1	-	4	
MFS 305	Forensic Serology & DNA Profiling	3	1	-	4	
MFS 306	Forensic Anthropology	3	1	-	4	
MFS 320	Practicals – I: Forensic Biology & Serology	2	-	6	5	
Specialization in Forensic Chemistry & Toxicology						
MFS 307	Forensic Chemistry	3	1	-	4	
MFS 308	Forensic Pharmacology, Toxicology & Pharmacognosy	3	1	-	4	
MFS 309	Forensic Toxicology – I	3	1	-	4	
MFS 310	Forensic Toxicology – II	3	1	-	4	
MFS 321	Practicals – I: Forensic Chemistry & Toxicology	2	-	6	5	
Specialization in Questioned Documents & Fingerprints						
MFS 311	Questioned Documents Examination - I	3	1	-	4	
MFS 312	Questioned Documents Examination - II	3	1	-	4	
MFS 313	Forensic Dactyloscopy	3	1	-	4	
MFS 314	Impression Evidence on Crime Scene	3	1	-	4	
MFS 322	Practicals – I: Questioned Documents & Fingerprints	2	-	6	5	
Specialization in Forensic Ballistics & Explosives						
MFS 315	Fundamentals of Forensic Ballistics	3	1	-	4	
MFS 316	Internal, External & Terminal Ballistics	3	1	-	4	
MFS 317	Basic Concept of Explosives	3	1	-	4	
MFS 318	Development, Classification & Analysis of Explosives	3	1	-	4	
MFS 323	Practicals – I: Forensic Ballistics & Explosives	2	-	6	5	
	TOTAL				**37**	

FOURTH SEMESTER

MFS 441	Communication Skills - IV	1	-	-	1	
MFS 443	Behavioural Science - IV	1	-	-	1	
MFS 444 MFS 445 MFS 446 MFS 447 MFS 448	Foreign Language - IV French German Spanish Japanese Chinese	2	-	-	2	
MFS 450	Internship (2 Weeks) - II	-	-	-	2	
MFS 455	Dissertation	-	-	-	12	
Electives: Select any one Specialization from the following:						
Specialization in Forensic Biology and Serology						
MFS 401	Advanced Forensic Biology	4	1	-	5	
MFS 402	Advanced Forensic Anthropology	4	1	-	5	
MFS 403	Advanced Forensic Serology & DNA Profiling	4	1	-	5	
MFS 420	Practicals – II: Forensic Biology & Serology	1	-	6	4	
Specialization in Forensic Chemistry & Toxicology						
MFS 404	Advanced Forensic Chemistry	4	1	-	5	
MFS 405	Advanced Forensic Pharmacology & Pharmacognosy	4	1	-	5	
MFS 406	Advanced Forensic Toxicology - I	4	1	-	5	
MFS 421	Practicals – II: Forensic Chemistry & Toxicology	1	-	6	4	
Specialization in Questioned Documents & Fingerprints						
MFS 407	Advanced Questioned Documents Examination – III	4	1	-	5	

MFS 408	Advanced Questioned Documents Examination - IV	4	1	-	5	
MFS 409	Advanced Fingerprint Development & Fingerprint Evidence in Court of Law & Advancement in Forensic Dactyloscopy	4	1	-	5	
MFS 422	Practicals – II: Questioned Documents & Fingerprints	1	-	6	4	
Specialization in Forensic Ballistics & Explosives						
MFS 410	Advanced Forensic Ballistics	4	1	-	5	
MFS 411	Wound Ballistics & Evaluation of Firearm Injuries	4	1	-	5	
MFS 412	Kinetics, Manufacturing & Analysis of Explosives	4	1	-	5	
MFS 423	Practicals – II: Forensic Ballistics & Explosives	1	-	6	4	
	TOTAL				**37**	

Curriculum & Scheme of Examination

CRIMINOLOGY, CRIMINAL LAW, POLICE ADMINISTRATION

Course Code: MFS 101 **Credit Units: 03**

Course Objective:

The objective of this course is to introduce to the student the concepts of crime and criminal behavior and factor of crime and criminological theory, criminal Justice system in India structural and functional process. Police Administration of India development and history and responsibilities and powers.

Course Contents:

Module I: Introduction to Criminology
Criminology –Definition Nature and Scope. Criminal Action and Criminal Behavior,
School of Criminology-Classical School and Positive School, Introduction of Victimology. Causes of crime. Social, Economic, Psychological, Political, Culture, and Geographical and their prevention. Juvenile Delinquency. Role of the Correctional Institutions

Module II: Crime Typologies and Theories of Criminology
White collar crime, Organized crime, Terrorism, Theory of Criminology-Differential Association Theory, Self Concept and Containment theory, Labelling theory, Barrier Theory. Sexual Offences- Prostitution and Abortion, Rape, Sexual Abuse of Child.

Module III: Criminal Law
Criminal Law-Definition Scope and development, sections of I.P.C, Cr.PC, and Law of Evidences, Criminal Justice System in India-structural and functional process.

Module IV: Nature and Type of Offences Structural and Prosecution
Offences: Criminal Offences, Nature and types, Prosecution: Structure and Authority, Framing of Charges, Collection of Evidence and witnesses, Courts: Structure and types- criminal courts, Juvenile Courts, Family Courts, 'Lok Adalat' and Human Right Courts

Module V: History of development of Police Administration
History of development of Police Administration, Police duties, Responsibilities and Powers, Organization and Structure of Police in India including Organization of a Police Station. Beat Constable and its role in crime prevention and detection work. Maintenance of Crime Records and Statistics, Discipline and control in Police.

Module VI: Police Investigation and Police Functionary System
Police and Maintenance of Law and order, Corruption and abuse of authority in Police, Police Investigation, police Act, Police-Community Relationship, and Accountability of Police to Law, People and Society, Custodial Death, Police and Human Right.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Ahmad Siddique: Criminology Problems & perspectives.
- Rama Ahuja: Social Problems in India.
- Batuk Lal: Law of Evidence
- Rao, S. Venugopal: Police Administration.
- Nath, Trilok: Indian Police.
- Mishra. S.C. : Police Administration in India
- Government of India, Ministry of Home Affairs: Reports of National Police Commission
- Sutherland and Cassey: Criminology

CRIME SCENE INVESTIGATION (CSI)

Course Code: MFS 102 **Credit Units: 03**

Course Objective:

This course would introduce the students to Forensic Science and its role in the investigative system. The students would be appraised about the crime scene management using which they would gain excellent knowledge regarding the handling of different physical evidences found at the crime scene, their properties and the various investigative techniques used in processing the crime scene.

Course Contents:

Module I: Crime Scene Management
Definition and causation of crime, Types of crime scene, Crime scene survey, protection of crime scene, searching of physical evidences, Recording, documentation and presentation in the court, processing and reconstruction of the crime scene

Module II: Physical Evidences
Definition, types (testimonial and real evidence), admissibility of scientific evidence and importance of physical evidences, Collection, preservation, packing and forwarding of different types of evidences to the laboratories.

Module III: Blood splatter analysis
Blood stain pattern analysis, Blood physics, dynamics of blood spattering, Hemodynamics and Blood as a medium, Impact spatter blood stains, Motion and directionality, Point of convergence and point of origin, Characteristic blood patterns. Preservation of blood evidence, procedures and precautions thereof.

Module IV: Investigation and interrogation
Law related to interrogation, interviewing of the criminals; methods used by the police in getting information from the criminal; the ethical issues related to the same.

Module V: Investigative Techniques
Criminal profiling, portrait parley, polygraphy, narcoanalysis, brain fingerprinting.

Module VI: Examination in the court
Expert Testimony: The role of the expert-witness; acceptance of evidence in the court; mental disorder and acceptance of evidence in court; child witness in the court. Direct examination and cross – examination of prosecution lawyer and defence lawyer.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Bodziak, W., Footwear Impression Evidence (2nd Edn.) CRC Press, Boca Raton, Florida, 2000.
- DeForest, P., Gaensslen, R., and Lee, H., Forensic Science - An Introduction to Criminilastics, McGraw Hill, New York, 1983.
- Fisher, B., Techniques of Crime Scene Investigation (6^{th} Edn.) CRC Press, Boca Raton, Florida, 2000.
- James, S., and Eskerc, W., Interpretation of Blood Stain Evidence at Crime Scenes, (2^{nd} Edn) CRC Press, Boca Raton, Florida, 1999.
- James, S.H., and Nordby, J.J., (Eds), Forensic Science; An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003.

FORENSIC PHYSICS

Course Code: MFS 103 **Credit Units: 03**

Course Objective:

On completion of this course, the students would be able to study the characteristics and properties of different evidences like glass, soil, paint, tool marks, hair and fiber which are normally encountered at the scene of crime. They would also be able to study the various methods by which these substances can be examined in the laboratory.

Course Contents:

Module I: Glass

Types of glass and their composition, Forensic examination of glass fractures under different conditions, determination of direction of impact: cone – fracture, rib marks, hackle marks, backward fragmentation, colour and fluorescence, physical matching, density comparison, physical measurements, refractive index by refractometer, elemental analysis, interpretation of glass evidence.

Module II: Soil

Formation and types of soil, composition and colour of soil, particle size distribution, turbidity test, microscopic examination, density gradient analysis, ignition loss, elemental analysis, interpretation of soil evidence, Discussion on important case studies of glass & soil.

Module III: Paint

Types of paint and their composition, macroscopic and microscopic studies, pigment distribution, micro-chemical analysis- solubility test, pyrolysis chromatographic techniques, TLC, colorimetry, IR spectroscopy and X-ray diffraction, elemental analysis, interpretation of paint evidence.

Module IV: Tool marks

Types of tool marks: compression marks, striated marks, combination of compression and striated marks, repeated marks, class characteristics and individual characteristics, tracing and lifting of marks, Photographic examination of tool marks and cut marks on clothes and walls etc.

Module V: Restoration of erased / obliterated marks*:*

Method of making-cast, punch, engrave; methods of obliteration, method of restoration- etching (etchings for different metals), magnetic, electrolytic etc., recording of restored marks – restoration of marks on wood, leather, polymer etc.

Module VI: Fiber

Types of fibres – forensic aspects of fibre examination – fluorescent, optical properties, refractive index, birefringence, dye analysis etc identification and comparison of man-made and natural fibre.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- B. Caddy, Forensic Examination of glass and paints analysis and interpretation, ISBN 078405749 2001.
- Bengold and Nelson Morgan, Speech and Audio Signal Processing, John Wiley and Sons, USA, 1999.
- Bengold and Nelson Morgan,, Speech and Audio signal processing, John Wiley and sons, USA, 1999.
- C.E. O 'Hara and J.W. Osterburg, An Introduction to Criminalistic, Indiana University Press, Blomington, 1972.
- Denis Shaw, Physics in the Prevention and Detection of Crime, Contem Phys. Vol.17, 1976.
- F.W. Sears, M.W Zemansky, and H.D. Young, University Physics, Sixth Ed., Narosa, 1995.
- Jenkins and White, Fundamentals of Optics, Mc Graw Hill, Fourth Ed, 1976.
- Nickolls, L.C., Scientific Investigation of Crime, Bulterwest, London, 1956.
- Philip Rose, Forensic Speaker Identification, Taylor and Francis Forensic Science Series, London 2001.
- R. Saferstein, Forensic Science Handbook, Vols. I, II, (Ed), Prentice Hall, Eaglewood Cliffs, NJ; 1988.
- Raymond C Murray and John C.F Tendrew, Forensic Geology, Prentice Hall, New Jersey, 1991.
- Working Procedure Manual: Physics BPR&D Publication, 2000.
- Tewari, R. K., Sastry, P.K and Ravi Kumar, K. V. Computer Crime & Computer Forensics select publisher, New Delhi. (2003)

- V. D. Dudeja: Cyber crimes & Law Vol. 2; Common wealth Pub. (2002)
- Willard Merritt, Dean & settle; Instrumental Methods of Analysis, CBS Publishers & Distributors, 7th Edn. New Delhi, (1986)

CYBER FORENSICS AND COMPUTER APPLICATIONS

Course Code: MFS 104 **Credit Units: 03**

Course Objective:

On completion of this course the students would be able to understand the fundamentals of computer, the various storage devices, the concepts of Operating Systems and to use Windows System. After acquiring this basic knowledge, the students will gain a good knowledge regarding the various ways in which Cyber crimes are committed, their investigation and the tools that are used for the analysis.

Course Contents:

Module I: Computer Fundamentals - I
Computer characteristics and classifications
Concept of Computer Hardware
Concept of Computer Software

Module II: Computer Fundamentals - II
Fundamentals of programming languages
Concept of Algorithm and Flow Chart
Networking and Internet Concepts

Module III: Data Storage Fundamentals
Data Storage Devices
Storage Fundamentals (Sector, Cluster, FAT, etc)
File System Concepts
Data Storage and Recovery
Basics of Operating System Software

Module IV: Pattern Recognition & Biometrics
Pattern Recognition & Biometrics – Face, Iris & retinal imaging, Speech recognition, finger for palm print, gait pattern, signatures, Pattern comparison, Computer simulation, Image processing – Image capturing, Image restoration & enhancement. Image editing, Compression Technique – Proactive Forensic science.

Module V: Cyber Crimes
Cyber Crimes – definition, IT laws – Introduction, internet, hacking, virus, obscenity, pornography, programme manipulation, software piracy, intellectual property and computer security etc, Encryption and Decryption methods.

Module VI: Search and seizures of evidence
Investigation of cyber crimes and tools for analysis

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- James, S.H. and Nordby, J.J. Eds., Forensic Science An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003.
- Leshin, C.B., Internet Investigation in Criminalistics, Prentice Hall, New Jersey, 1997.
- Tessarolo, A.A. and Marignani, A., Forenisc Science and the Internet. The Canadian Society of Forensic Science Journal, Vol. 29, 1996.
- Bernad Jahne: Digital Image processing, Springer Verlag (1993)

GENERAL FORENSIC SCIENCE

Course Code: MFS 105 **Credit Units: 03**

Course Objective:

This course would introduce the students to Forensic Science and its role in the investigative system. The students would be appraised about the functions and principles of Forensic Science, its historical development and the different types of evidences encountered in the field of Forensic Science. They would also acquire knowledge regarding functions and services provided by the Forensic Laboratories and the important areas of specialization.

Course Contents:

Module I: Introduction to Forensic Science
Introduction, History, and development of Forensic Science, Basic principles and significance, Utilization of Forensic Science at the crime scene and in the court, Role, qualities and importance of an Investigating Officer and a Forensic Scientist at the scene of crime.

Module II: Quality Management (ISO/IEC 17025)
Organizational structure of Forensic Science Laboratories, Various sections and functions of Forensic Science Laboratory. General requirements for the competence of testing and calibration laboratories – Introduction, Scope, Management requirements: Organization, Quality System, Document Control, Review of requests, Tenders and contracts, Subcontracting of tests and calibration, Purchasing services and supplies, Service to the clients, Complaints, Corrective and preventive actions, Control of records, Internal Audits.

Module III: Toxicology
Definition, dosage, administration of poisons, Classification of poisons, action of poisons & factors modifying its action The role of drug recognition expert, Drugs of Abuse, Signs and symptoms of addiction, Interpreting drug findings, Role of toxicologists, Significance of toxicological findings, Functions and roles of toxicologists in a forensic science lab; Techniques used in toxicology.

Module IV: Forensic Biology & Serology
Definition & Scope of Forensic Biology & Serology, Nature & Type of Biological evidences (Both animal & plant origin), various body fluids, their composition & Forensic Importance: Blood, Semen, Saliva, Urine, milk etc. Types of blood groups, Introduction to DNA profiling.

Module V: Forensic Ballistics
Introduction to Firearm and its parts, ammunition, types of ammunition, various components of ammunitions, firing mechanism, introduction to the branches of ballistics, forensic identification of firearms.

Module VI: Questioned Document & Fingerprints
Introduction to Forensic document examination, handwriting identification, identification of fraudulent and altered documents. Fingerprint, general classification, ridge characteristics and comparison.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Bodziak, W., Footwear Impression Evidence (2nd Edn.) CRC Press, Boca Raton, Florida, 2000.
- DeForest, P., Gaensslen, R., and Lee, H., Forensic Science; An Introduction to Criminalitics, McGraw Hill, New York, 1983.
- Fisher, B., Techniques of Crime Scene Investigation (6th Edn.) CRC Press, Boca Raton, Florida, 2000.
- James, S. H. And Nordby, J. J. (Eds), Forensic Science - An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003.
- James, S., and Eskerc, W., Interpretation of Blood Stain Evidence at Crime Scenes, (2nd Edn) CRC Press, Boca Raton, Florida, 1999.
- Saferstein, Richard, Criminalistics, An Introduction to Forensic Science, 6th Ed. Prentice-Hall, New Jersey, 1998.
- Sharma, B. R., Forensic Science in Criminal Investigation and Trials (3rd Edn) Universal Law Publishing Co. Ltd. New Delhi, 2001.
- Cummins, H. and Midlo, C.: Fingerprints, Palms and Soles.

- Bridges, B.C.: Practical Fingerprinting
- Holt, S.B.: Genetics of Dermal Ridges

COMMUNICATION SKILLS – I

Course Code: MFS 141 **Credit Units: 01**

Course Objective:

The Course is designed to give an overview of the four broad categories of English Communication thereby enhance the learners' communicative competence.

Course Contents:

Module I: Listening Skills
Effective Listening: Principles and Barriers
Listening Comprehension on International Standards

Module II: Speaking Skills
Pronunciation and Accent
Reading excerpts from news dailies & magazines
Narrating Incident; Story telling.
Extempore & Role Plays

Module III: Reading Skills
Vocabulary: Synonyms, antonyms, diminutives, homonyms, homophones
Idioms & phrases
Foreign words in English

Module IV: Writing Skills
Writing Paragraphs
Précis Writing
Letter writing
Coherence and structure
Essay writing

Module V: Activities
News reading
Picture reading
Movie magic
Announcements

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Working in English, Jones, Cambridge
- Business Communication, Raman –Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge

BEHAVIOURAL SCIENCE - I
(SELF-DEVELOPMENT AND INTERPERSONAL SKILLS)

Course Code: MFS 143 **Credit Units: 01**

Course Objective:

This course aims at imparting an understanding of:
Self and the process of self exploration
Learning strategies for development of a healthy self esteem
Importance of attitudes and their effect on work behaviour
Effective management of emotions and building interpersonal competence.

Course Contents:

Module I: Understanding Self
Formation of self concept
Dimension of Self
Components of self
Self Competency

Module II: Self-Esteem: Sense of Worth
Meaning and Nature of Self Esteem
Characteristics of High and Low Self Esteem
Importance & need of Self Esteem
Self Esteem at work
Steps to enhance Self Esteem

Module III: Emotional Intelligence: Brain Power
Introduction to EI
Difference between IQ, EQ and SQ
Relevance of EI at workplace
Self assessment, analysis and action plan

Module IV: Managing Emotions and Building Interpersonal Competence
Need and importance of Emotions
Healthy and Unhealthy expression of emotions
Anger: Conceptualization and Cycle
Developing emotional and interpersonal competence
Self assessment, analysis and action plan

Module V: Leading Through Positive Attitude
Understanding Attitudes
Formation of Attitudes
Types of Attitudes
Effects of Attitude on
Behaviour
Perception
Motivation
Stress
Adjustment
Time Management
Effective Performance
Building Positive Attitude

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:

- Towers, Marc: Self Esteem, 1st Edition 1997, American Media

- Pedler Mike, Burgoyne John, Boydell Tom, A Manager's Guide to Self-Development: Second edition, McGraw-Hill Book Company.
- Covey, R. Stephen: Seven habits of Highly Effective People, 1992 Edition, Simon & Schuster Ltd.
- Khera Shiv: You Can Win, 1st Edition, 1999, Macmillan
- Gegax Tom, Winning in the Game of Life: 1st Edition, Harmony Books
- Chatterjee Debashish, Leading Consciously: 1998 1st Edition, Viva Books Pvt. Ltd.
- Dr. Dinkmeyer Don, Dr. Losoncy Lewis, The Skills of Encouragement: St. Lucie Press.
- Singh, Dalip, 2002, Emotional Intelligence at work; First Edition, Sage Publications.
- Goleman, Daniel: Emotional Intelligence, 1995 Edition, Bantam Books
- Goleman, Daniel: Working with E.I., 1998 Edition, Bantam Books.

FRENCH - I

Course Code: MFS 144 **Credit Units: 02**

Course Objective:

To familiarize the students with the French language

- with the phonetic system
- with the syntax
- with the manners
- with the cultural aspects

Course Contents:

Module A: pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1, 2
Only grammar of Unité 3: objectif 3, 4 and 5

Contenu lexical:

Unité 1: Découvrir la langue française : (oral et écrit)

1. se présenter, présenter quelqu'un, faire la connaissance des autres, formules de politesse, rencontres
2. dire/interroger si on comprend
3. Nommer les choses

Unité 2: Faire connaissance

1. donner/demander des informations sur une personne, premiers contacts, exprimer ses goûts et ses préférences
2. Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

Unité 3: Organiser son temps

1. dire la date et l'heure

Contenu grammatical:

1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel
4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation : Inversion, est-ce que, qui, que, quoi, qu'est-ce que, où, quand, comment, quel(s), quelle(s)
   Interro-négatif : réponses : oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futur proche

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN - I

Course Code: MFS 145 Credit Units: 02

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Introduction
Self introduction: heissen, kommen, wohnwn, lernen, arbeiten, trinken, etc.
All personal pronouns in relation to the verbs taught so far.
Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),
Hallo, wie geht's?: Danke gut!, sehr gut!, prima!, ausgezeichnet!,
Es geht!, nicht so gut!, so la la!, miserabel!

Module II: Interviewspiel
To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

Module III: Phonetics
Sound system of the language with special stress on Dipthongs

Module IV: Countries, nationalities and their languages
To make the students acquainted with the most widely used country names, their nationalitie and the language spoken in that country.

Module V: Articles
The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

Module VI: Professions
To acquaint the students with professions in both the genders with the help of the verb "sein".

Module VII: Pronouns
Simple possessive pronouns, the use of my, your, etc.
The family members, family Tree with the help of the verb "to have"

Module VIII: Colours
All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

Module IX: Numbers and calculations – verb "kosten"
The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.
"Wie viel kostet das?"

Module X: Revision list of Question pronouns
W – Questions like who, what, where, when, which, how, how many, how much, etc.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch

- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant - 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – I

Course Code: MFS 146 **Credit Units: 02**

Course Objective:

To enable students acquire the relevance of the Spanish language in today's global context, how to greet each other. How to present / introduce each other using basic verbs and vocabulary

Course Contents:

Module I
A brief history of Spain, Latin America, the language, the culture…and the relevance of Spanish language in today's global context.
Introduction to alphabets

Module II
Introduction to '*Saludos*' (How to greet each other. How to present / introduce each other).
Goodbyes (despedidas)
The verb *llamarse* and practice of it.

Module III
Concept of Gender and Number
Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors, Revision of numbers and introduction to ordinal numbers.

Module IV
Introduction to *SER* and *ESTAR* (both of which mean To Be).Revision of '*Saludos*' and '*Llamarse*'. Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of *Ser* and *Estar*.

Module V
Time, demonstrative pronoun (Este/esta, Aquel/aquella etc)

Module VI
Introduction to some key AR /ER/IR ending regular verbs.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

JAPANESE - I

Course Code: MFS 147 **Credit Units: 02**

Course Objective:

To enable the students to learn the basic rules of grammar and Japanese language to be used in daily life that will later help them to strengthen their language.

Course Contents:

Module I: Salutations
Self introduction, Asking and answering to small general questions

Module II: Cardinal Numbers
Numerals, Expression of time and period, Days, months

Module III: Tenses
Present Tense, Future tense

Module IV: Prepositions
Particles, possession, forming questions

Module V: Demonstratives
Interrogatives, pronoun and adjectives

Module VI: Description
Common phrases, Adjectives to describe a person

Module VII: Schedule
Time Table, everyday routine etc.

Module VIII: Outings
Going to see a movie, party, friend's house etc.

Learning Outcome

- Students can speak the basic language describing above mentioned topics

Methods of Private study /Self help

- Handouts, audio-aids, and self-do assignments and role-plays will support classroom teaching

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – I

Course Code: MFS 148 Credit Units: 02

Course Objective:

There are many dialects spoken in China, but the language which will help you through wherever you go is Mandarin, or Putonghua, as it is called in Chinese. The most widely spoken forms of Chinese are Mandarin, Cantonese, Gan, Hakka, Min, Wu and Xiang. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Show pictures, dialogue and retell.
Getting to know each other.
Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called "Hanyu Pinyin" in Mandarin Chinese.)
Practicing of Tones as it is a tonal language.
Changes in 3rd tone and Neutral Tone.

Module II
Greetings
Let me Introduce
The modal particle "ne".
Use of Please 'qing" – sit, have tea …….. etc.
A brief self introduction – Ni hao ma? Zaijian!
Use of "bu" negative.

Module III
Attributives showing possession
How is your Health? Thank you
Where are you from?
A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.
Are you busy with your work?
May I know your name?

Module IV
Use of "How many" – People in your family?
Use of "zhe" and "na".
Use of interrogative particle "shenme", "shui", "ma" and "nar".
How to make interrogative sentences ending with "ma".
Structural particle "de".
Use of "Nin" when and where to use and with whom. Use of guixing.
Use of verb "zuo" and how to make sentences with it.

Module V
Family structure and Relations.
Use of "you" – "mei you".
Measure words
Days and Weekdays.
Numbers.
Maps, different languages and Countries.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I" Lesson 1-10

PRACTICALS ON FORENSIC PHYSICS AND CSI

Course Code: MFS 120 **Credit Units: 04**

Course Contents:

1. Sketching of the Crime scene (Indoor and Outdoor)
2. Photography of the scene of crime
3. Collection, packaging and forwarding of different Physical evidences
4. Blood splatter analysis
5. Examination of physical properties of Fibers
6. Examination of physical properties of Glass.
7. Examination of physical properties of Soil and debris
8. Examination of physical properties of Paints
9. Examination of physical properties of Sealing Wax
10. Comparison of bangles, threads, cloth, etc.
11. Examination of tool marks
12. Resuscitations and restoration of tool marks, erased numbers tec.

Examination Scheme:

Practical Exam:	35
Attendance and report submission of visit:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

The students will go for one week visit to Court/ Forensic Science Laboratory/ Mortuary. A report will be submitted by the students to the faculties which will be evaluated.

PRACTICALS ON GENERAL FORENSIC SCIENCE

Course Code: MFS 121 **Credit Units: 04**

Course Contents:

1. Analysis of some irritant and corrosive poisons
2. Study of various parts of the firearms: - barrel, action, stock, caliber, choke etc.
3. ABO, Rh, MN, Kell grouping of fresh blood
4. Preliminary tests for blood and other body fluids
5. Photography of documents and fingerprints (Transmitted light/Oblique light/U.V. Light Photogrphy).
6. Taking of fingerprints on fingerprint chart.
7. Development of latent Finger Prints.

Examination Scheme:

Practical Exam:	35
Attendance and report submission of visit:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

The students will go for one week visit to Court/ Forensic Science Laboratory/ Mortuary. A report will be submitted by the students to the faculties which will be evaluated.

FORENSIC PHOTOGRAPHY

Course Code: MFS 201 **Credit Units: 03**

Course Objective:

On completion of this course, the students would be able to understand the parts of a camera, forensic importance of Forensic photography and different types of photography used in the investigation of crime.

Course Contents:

Module I: Introduction
Introduction to forensic photography; Required equipments for photography – Camera, lens, shutter, depth of field, film; Importance of Forensic photography in a crime scene investigation.

Module II: Types of photography
History and Development of Photography. Basic principles and techniques of Black & White and colour photography, Photography in indoor and outdoors scene of crime; aerial photography. Significance of Photography in Forensic Science.

Module III: Photo prints
Developing techniques and methods of photography, Different kinds of developers and fixers, modern developments in photography, linkage of cameras and film negatives.

Module IV: Photography and crime scene
Surveillance photography – Cameras and accessions for surveillance photography moving surveillance on foot, 2-person foot surveillance moving, surveillance with vehicles, fixed surveillance, Use of photography in reconstructing the scene of crime and its presentation in the court of law.

Module V: Guidance documentation
Image magnification, U. V. and I. R. illumination, Art factual evidences (Bloodstain, fingerprint, imprints, and micro evidence.

Module VI: High tech photography for crime scene
Digital photography, how digital camera works and basics of digital imaging. videography/high speed videography, High-speed photography, legal aspects of visual evidence.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Redsicker, D. R., The Practical methodology of Forensic Photography, CRC Press, London, 1994.
- Henry Horeustein; Colour Photography -A working Manual, Little Brown Co. Boston (1995)
- B.H.E. Jacobson, Ray GG Attridge; The Manual of Photography, Focal Press, London (1988)
- Jahne B; Digital Image Processing, Heidelberg Springer (1996)
- H.L. Blitzer and J. Jacobia; Forensic Digital Imaging and Photography, Academic Press (2002)
- David R. Redsicker; The Practical Methodology of Forensic Photography- 2nd Ed. CRC Press LLC (2001)
- R.E. Jacobson, S.F. Ray, G.G. Attridge, N.R. Oxford; The Manual of Photography- Photographic and Digital Imaging, 9th Ed., Focal Press (2000)

ELEMENTS OF FORENSIC MEDICINE, ODONTOLOGY AND PSYCHIATRY

Course Code: MFS 202 **Credit Units: 03**

Course Objective:

The course is designed to expose students to the theoretical aspects of forensic medicine, odontology and psychiatry. At the end of the course students will have acquired a theoretical knowledge pertaining to thease fileds and its relevance to the practice in the field of forensic sciences. Since these fields are inter related, the forensic examination of exhibits with a case history of injury, death & poisoning will be relevant as to the corroboration of evidences in the court of law. The students will also learn about the relation between mental illnesses & crimes

Course Contents:

Module I: Forensic medicine - I
Definition of forensic medicine, Cause, manner and characteristics of death. Deaths due to natural diseases Post mortem changes, Time since death, Autopsy,.

Module II: Forensic medicine - II
Basic injury mechanisms, Mechanical injuries (due to sharp, blunt weapons/objects & projectiles) and their medicolegal significance.

Module III: Forensic medicine - III
Deaths due to Asphyxia, Deaths due to fire, electrocution and poisoning..Various Sexual offences
Criminal abortion, sudden infant death syndrome, Infanticide & child homicide.

Module IV: Forensic Odontology - I
Definition and Scope of Forensic Odontology, Types of dentition, Basic structure of human teeth, types of teeth & their morphology, and determination of age from teeth using various methods, dental anomalies and their role in Personal Identification.

Module V: Forensic Odontology - II
Bite marks: Types & forensic importance .Collection and preservation of samples, analysis of Bite marks, presentation of bite mark evidences in court of law.
Role of Forensic Odontology in mass disaster victim identification. .Comparison of Antemortem and postmortem dental records.Dental Charting.

Module VI: Forensic Psychiatry
Definition and scope of Forensic Psychiatry .Introduction to different mental illnesses; neurosis (depression, mood dosorder, Psychosis(Delusion, delirium, schizophrenia),Impulsive control stress disorder, Anti social personality disorder, psychopathy, Post traumatic stress disorder and post partum stress disorder. Association between mental disorder and crime. Mc Naughten rule, diminshed responsibility, testamentary capacity.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Modi's Medical Jurisprudence and Toxicology,23rd Edition, by K. Mathiharan & Amrit K. Patnaik, Third reprint, 2009, LexisNexis, Butterworth, New Delhi
- Essentials of forensic medicine, Dr. K. S. Narayan Reddy.
- Forensic Medicine and toxicology, JB Mukherjee, Vol I & II.
- Forensic Dentistry, Paul. G. Stimson & Curtis. A. Mertz, CRC
- Forensic Odontology, Pramod .K. Dayal
- Oxford text book of Psychiatry, Oxford University Press (OUP) Author(s): Michael G. Gelder, Juan J. Lopez-Ibor, and Nancy Andreasen
- Keith Simpson's , Forensic Medicine
- Parikh's Medical Jurisprudence and Toxicology
- Gleister's Medical Jurispridence and Toxicology, Churchill Livingstone Dental Anatomy Atlas, Whitaker

PRINCIPLES OF HUMAN GENETICS

Course Code: MFS 203 Credit Units: 03

Course Objective:

The students will learn about the laws of genetics, organization of chromosomes, cell division, various types of mutations and various genetic disorders

Course Contents:

Module I: Mendelism
Mendels work, laws of heredity, Test cross, Incomplete dominance and simple problems

Module II: Chromosomes
Discovery, morphology and structural Organization - centromere, secondary construction, telomere, chromonema, euchromatin and heterochromatin, chemical composition and karyotype. Ultrastructure: Single-stranded hypotheses, folded-fibre and nucleosome models. Special types of chromosomes; Salivary gland and Lampbrush chromosomes. Structure of DNA and RNA

Module III: Interaction of Genes
Supplementary factors, Complementary genes, Multiple factors, Epistasis, Multiple Allelism: Blood groups in human beings.

Module IV: Cell Division
Cell cycle, mitosis and meiosis. Coupling and repulsion hypothesis, Linkage in maize and Drosophila, Mechanism of crossing over and its importance, Chromosome mapping – Linkage map in maize.

Module V: Mutations
Types: spontaneous's and induced, Mutagens: Physical and chemical, Mutation at the molecular level. Mutations in plants, animals, and microbes for economic benefit of man.

Module VI: Human Genetics
Karyotype in man, Inherited disorders - Allosomal (Klinefelter syndrome and Turner's syndrome), Autosomal (Down's syndrome and Cri-Du-Chat syndrome).

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Essentials of Human Genetics by S.M. Bhatnagar etal (1999) IV edition. Orient Longman.
- Human Genetics: Concepts and Applications by Lewis R (2001) McGraw Hill; Boston.
- Basic Human Genetics by E.J. Manage and A.P. Manage (1997 India Reprint) Rastogi Publications, Meerut.
- Mendelian inheritance in Man: Catalogs of Autosomal recessive, and x-linked phenotypes.[12teditions – 1998] by Mc Kusick, V.A. Johns Hopkins university press, Baltimore.
- Principles and Practive of Medical Genetics, by Emery, A.E.H and D.L. Rimoin (Eds_ (1990-2nd edition) Churchill Livingstone, Edinburgh.
- Molecular Basis of Inherited Diseases, (6th Edition-1989) by Scriver, C.R. A.L. Beudit, W.S. Styabnd D. Valle (Eds0 McGraw Hill, New York.
- Human Genetics by S.D. Gangane (2nd edition-Reprint 2001), B.L Churchill Livingstone Pvt. Ltd., New Delhi.
- Genetics in Medicine by M.W. Thompson et al, 5th Edition, W.B. Sounders Company, London
- Genetic basis of common diseases by R. A. King et al, Oxford University Press.
- Mendelian inheritance in Man by Mc. Kusick V.A. (1998), 12th Edition, John Hopsins University Press, Baltilmore.

FORENSIC LINGUISTICS AND PHONETICS

Course Code: MFS 204 **Credit Units: 03**

Course Objective:

The students will learn about Voice identification, recognition and speaker identification. The students will also learn how tapes can be authenticated.

Course Contents:

Module I: Forensic Linguistics
Definition of Forensic Linguistics – Theories – analytical methods of linguistics – place of forensic linguistics in the applied linguistics – area of research in the forensic linguistics.

Module II: Phonology and Forensic Linguistics
Phonetics and phonology – voice identification – Author identification – Dialect identification –linguistics proficiency – Forensic phonetics – Speaker identification – Transcription.

Module III: Morphology and Forensic Linguistics
Words used for conveying Meaning – symbols – place of Morphology in Forensic linguistics – Morphological analysis of Forensic Materials – identification.

Module IV: Language use in Forensic linguistics
Language use in Threatening letters – anonymous letters – Suicide notes – language of SMS – Email threatening – identification – Discourse structure.

Module V: Forensic Linguistics and Psycholinguistics
The relationship found between Forensic linguistics and Psycholinguistics – human cognitive system on language processing – use of psychological factors on forensic linguistics.

Module VI: Speaker Identification and Tape Authentication
Voice production theory – vocal anatomy, Speech signal processing and pattern recognition – basic factors of sound in speech, acoustic characteristics of speech signal, Fourier analysis, frequency and time domain representation of speech signal, analogue to digital signal and conversion, Fast Fourier transform, quantization, digitization and speech enhancement, analysis of audio-video signal for authenticity, Introduction to the techniques of pattern recognition and comparison

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Bengold and Nelson Morgan,, Speech and Audio signal processing, John Wiley and sons, USA, 1999.
- Philip Rose, Forensic Speaker Identification, Taylor & Francis Forensic Science series, London 2001
- R. Saferstein, Forensic Science Handbook, Vols. I, II, (Ed), Prentice Hall, Eaglewood Cliffs, NJ; 1988

FORENSIC ASPECTS IN SPORTS

Course Code: MFS 205 **Credit Units: 03**

Course Objective:

The students will learn about the various types of dope used in sports, its identification methods from body fluids and other forensic issues related to sports personnel**.**

Course Contents:

Module I: Dope and its History

Module II: Methods of Doping

Module III: Nature and types of Dope

Module IV: Detection and identification of doping materials
Detection from Saliva, Urine, Blood, and other Body Fluids and hair and its harmful effects

Module V: Determination of sex of Athletes/sports personnel

Module VI: Presentation of evidence

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- B. Madea, W. Greener, F. Mussoff, R. Derrmerger (1998): Medico-legal Aspects of Doping. Journal of Clinical Frensic Medicine. 5,1-7.
- International Olympic committee, IDC, Olympic Movement Antidoping Code IOC, Laussane (Switzerland), 1999
- H. Sachs and P. Kintz (2003) Consensus of the society of hair testing for doping agents, forensic Science International, 107:3.
- E.J. Cone (1996) Mechnnism of Drug incorporation into Hair Theraprutic Drug Monitering, 18: 438-443.
- Brent C. Mangus, Michael G. Miller (2005) Pharmacology Application In Athletic Training
- Charles E. Yesalis, Virginia S. Cowart (1998) The Steroids Game
- Alessandra Santana da Silva (1999) Doping: Aspectos Penais
- Ivan Waddington (2000) Sport, Health and Drugs: A Critical Sociological Perspective

COMMUNICATION SKILLS - II

Course Code: MFS 241 **Credit Units: 01**

Course Objective:

To enrich the understanding of English language and communication, structure, style, usage, and vocabulary for global business purposes.

Course Contents:

Module I: Fundamentals of Communication
Role and purpose of communication: *7 C's of communication*
Barriers to effective communication
Enhancing listening
Forms of Communication: one-to-one, informal and formal

Module II: Verbal Communication (Written)
Business Letter
Social correspondence
Writing resume and Job applications

Module III: Speaking skills
Conversational English
Guidelines to give an effective presentation
Activities to include:
Presentations by students
Just a minute

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Business Communication, Raman – Prakash, Oxford
- Textbook of Business Communication, Ramaswami S, Macmillan
- Speaking Personally, Porter-Ladousse, Cambridge

BEHAVIOURAL SCIENCE - II
(BEHAVIOURAL COMMUNICATION AND RELATIONSHIP MANAGEMENT)

Course Code: MFS 243 **Credit Units: 01**

Course Objective:

This course aims at imparting an understanding of:
Process of Behavioural communication
Aspects of interpersonal communication and relationship
Management of individual differences as important dimension of IPR

Course Contents:

Module I: Behavioural Communication
Scope of Behavioural Communication
Process – Personal, Impersonal and Interpersonal Communication
Guidelines for developing Human Communication skills
Relevance of Behavioural Communication in relationship management

Module II: Managing Individual Differences in Relationships
Principles
Types of issues
Approaches
Understanding and importance of self disclosure
Guidelines for effective communication during conflicts

Module III: Communication Climate: Foundation of Interpersonal Relationships
Elements of satisfying relationships
Conforming and Disconfirming Communication
Culturally Relevant Communication
Guideline for Creating and Sustaining Healthy Climate

Module IV: Interpersonal Communication
Imperatives for Interpersonal Communication
Models – Linear, Interaction and Transaction
Patterns – Complementary, Symmetrical and Parallel
Types – Self and Other Oriented
Steps to improve Interpersonal Communication

Module V: Interpersonal Relationship Development
Relationship circle – Peer/ Colleague, Superior and Subordinate
Initiating and establishing IPR
Escalating, maintaining and terminating IPR
Direct and indirect strategies of terminating relationship
Model of ending relationship

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Simons, Christine, Naylor, Belinda: Effective Communication for Managers, 1997 1st Edition Cassell
- Harvard Business School, Effective Communication: United States of America
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.

FRENCH - II

Course Code: MFS 244 **Credit Units: 02**

Course Objective:

- To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French.
- To make them learn the basic rules of French Grammar.

Course Contents:

Module A: pp.38 – 47: Unité 3: Objectif 3, 4, 5. 6

Module B: pp. 47 to 75 Unité 4, 5

Contenu lexical:

Unité 3: Organiser son temps

1. donner/demander des informations sur un emploi du temps, un horaire SNCF – Imaginer un dialogue
2. rédiger un message/ une lettre pour …
   i) prendre un rendez-vous/ accepter et confirmer/ annuler
   ii) inviter/accepter/refuser
3. Faire un programme d'activités
   imaginer une conversation téléphonique/un dialogue
   Propositions- interroger, répondre

Unité 4: Découvrir son environnement

1. situer un lieu
2. s'orienter, s'informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie

Unité 5: s'informer

1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s'informer

Contenu grammatical:

1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l'aide de :
   i. « de » ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative - construction à l'infinitif
4. Impératif/exprimer l'obligation/l'interdiction à l'aide de « il faut…. »/ «il ne faut pas… »
5. passé composé
6. Questions directes/indirectes

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN – II

Course Code: MFS 245 Credit Units: 02

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Grammar to consolidate the language base learnt in Semester I

Course Contents:

Module I: Everything about Time and Time periods
Time and times of the day.
Weekdays, months, seasons.
Adverbs of time and time related prepositions

Module II: Irregular verbs
Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

Module III: Separable verbs
To comprehend the change in meaning that the verbs undergo when used as such
Treatment of such verbs with separable prefixes

Module IV: Reading and comprehension
Reading and deciphering railway schedules/school time table
Usage of separable verbs in the above context

Module V: Accusative case
Accusative case with the relevant articles
Introduction to 2 different kinds of sentences – Nominative and Accusative

Module VI: Accusative personal pronouns
Nominative and accusative in comparison
Emphasizing on the universal applicability of the pronouns to both persons and objects

Module VII: Accusative prepositions
Accusative propositions with their use
Both theoretical and figurative use

Module VIII: Dialogues
Dialogue reading: 'In the market place'
'At the Hotel'

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – II

Course Code: MFS 246 **Credit Units: 02**

Course Objective:

To enable students acquire more vocabulary, grammar, Verbal Phrases to understand simple texts and start describing any person or object in Simple Present Tense.

Course Contents:

Module I
Revision of earlier modules.

Module II
Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

Module III
More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs *(bueno/malo, muy, mucho, bastante, poco).*
Simple texts based on grammar and vocabulary done in earlier modules.

Module IV
Possessive pronouns

Module V
Writing/speaking essays like my friend, my house, my school/institution, myself….descriptions of people, objects etc, computer/internet related vocabulary

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

JAPANESE - II

Course Code: MFS 247 **Credit Units: 02**

Course Objective:

To enable the students to converse in the language with the help of basic particles and be able to define the situations and people using different adjectives.

Course Contents:

Module I: Verbs
Transitive verbs, intransitive verbs

Module II: More prepositions
More particles, articles and likes and dislikes.

Module III: Terms used for instructions
No parking, no smoking etc.

Module IV: Adverbs
Different adverbial expression.

Module V: Invitations and celebrations
Giving and receiving presents,
Inviting somebody for lunch, dinner, movie and how to accept and refuse in different ways

Module VI: Comprehension's
Short essay on Family, Friend etc.

Module VII: Conversations
Situational conversations like asking the way, At a post office, family

Module VIII: Illness
Going to the doctor, hospital etc.

Learning Outcome

- Students can speak the language describing above-mentioned topics.

Methods of Private study /Self help

- Handouts, audio-aids, and self-do assignments.
- Use of library, visiting and watching movies in Japan and culture center every Friday at 6pm.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – II

Course Code: MFS 248 Credit Units: 02

Course Objective:

Chinese is a tonal language where each syllable in isolation has its definite tone (flat, falling, rising and rising/falling), and same syllables with different tones mean different things. When you say, "ma" with a third tone, it mean horse and "ma" with the first tone is Mother. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Practice reading aloud
Observe Picture and answer the question.
Tone practice.
Practice using the language both by speaking and by taking notes.
Introduction of basic sentence patterns.
Measure words.
Glad to meet you.

Module II
Where do you live?
Learning different colors.
Tones of "bu"
Buying things and how muchit costs?
Dialogue on change of Money.
More sentence patterns on Days and Weekdays.
How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end ….. etc.
Morning, Afternoon, Evening, Night.

Module III
Use of words of location like-li, wais hang, xia
Furniture – table, chair, bed, bookshelf,.. etc.
Description of room, house or hostel room.. eg what is placed where and how many things are there in it?
Review Lessons – Preview Lessons.
Expression 'yao", "xiang" and "yaoshi" (if).
Days of week, months in a year etc.
I am learning Chinese. Is Chinese difficult?

Module IV
Counting from 1-1000
Use of "chang-chang".
Making an Inquiry – What time is it now? Where is the Post Office?
Days of the week. Months in a year.
Use of Preposition – "zai", "gen".
Use of interrogative pronoun – "duoshao" and "ji".
"Whose"??? Sweater etc is it?
Different Games and going out for exercise in the morning.

Module V
The verb "qu"
Going to the library issuing a book from the library
Going to the cinema hall, buying tickets
Going to the post office, buying stamps
Going to the market to buy things.. etc
Going to the buy clothes …. Etc.
Hobby. I also like swimming.
Comprehension and answer questions based on it.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I" Lesson 11-20

PRACTICAL ON FORENSIC MEDICINE AND ODONTOLOGY

Course Code: MFS 220 **Credit Units: 04**

Course Contents:

1. Identification of individual from teeth based on the morphological features.
2. Dental charting.
3. Estimation of age from the teeth.
4. Comparison and Identification of Individuals from bite marks
5. Autopsy observation through visits and recording the files

Examination Scheme:

Practical Exam:	35
Attendance and report submission of visit:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

The students will go for one week visit to Court/ Forensic Science Laboratory/ Mortuary. A report will be submitted by the students to the faculties which will be evaluated.

PRACTICAL ON FORENSIC PHOTOGRAPHY

Course Code: MFS 221 **Credit Units: 04**

Course Contents:

1. Camera, its various parts & their importance

2. Taking Photographs
   - Photography of Outdoor Crime Scene
   - Indoor photography including the laboratory

3. Developing and fixing of films
   - Black & White
   - Color

4. Enlargement & Printing

5. Presentation of Evidence through Photograph and charts

6. Digital photography.

Examination Scheme:

Practical Exam:	35
Attendance and report submission of visit:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

INSTRUMENTAL ANALYSIS

Course Code: MFS 301 **Credit Units: 04**

Course Objective:

On completion of this course the students will have a thorough knowledge of the various instruments used in the analysis of different substances encountered during a criminal investigation They would be able to understand the various types of instrumentation, their Forensic application, their methods of sample analysis and the different types of detectors used for detecting the various substances.

Course Contents:

Module I: Microscopy
Basic principles, Simple and Compound microscope, Comparison microscope, Phase contrast Microscope, Stereoscopic microscope, Polarizing microscope, Fluorescent Microscopy, Infra red Microscopy, Scanning Electron Microscope (SEM) & Transmission Electron Microscope (TEM)

Module II: Immuno-chemical Technique
General principles, Production of antibodies, Precipitin reaction, Gel immuno-diffusion, Immuno-electrophoresis, complement fixation, Radio Immuno Assay (RIA), ELISA, Fluorescence immuno assay.

Module III: Chromatographic Techniques
General principles, Paper chromatography, column chromatography, TLC, Adsorption chromatography, Partition chromatography, Gas chromatography, Gas- liquid chromatography, Ion-exchange chromatography, Exclusion (permeation)
chromatography, Affinity chromatography, HPLC, HPTLC, Capillary Chromatography

Module IV: Electrophoretic Technique
General principles, Factors affecting electrophoresis, Low voltage thin sheet electrophoresis, High voltage electrophoresis, Sodium dodecylsulphate (SDS) polyacrylamide gel electrophoresis, Isoelectric focusing (IEF), Isoelectrophoresis, Preparative electrophoresis, Horizontal and Vertical Electrophoresis

Module V: Spectrophotometery
Ultra violet and visible spectrophotometry: Types of sources and stability, wavelength selection, filters-cells and sampling devices, detectors, resolution, qualitative and quantitative methods for detection, Fluorescence and phosphorescence spectrophotometry, Atomic absorption spectrometry, Atomic emission spectrometer, X-ray spectroscopy, Infrared spectrophotometry, Mass spectrophotometer

Module VI: Radiochemical techniques
Basic principles and theory, introduction about nuclear reactions and radiations, Neutron sources, Neutron Activation Analysis (NAA)

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Lindsay S; High Performance Liquid Chromatography, Wiley & Sons NY (1992)
- Baker DR.; Capillary- Electrophoresis, NY (1995)
- Handbook of TLC, 2nd Ed, Marcel Dekker; NY (1995)
- Jarris, KE, A.L. Gray etal, Handbook of Inductively Coupled Plasma Mass Spectrometry, Glasgow Blockie, (1992)
- Maclaffrty F.W. & F. Turecek; Interpretation of Mass spectra, 4th Ed., Mill Valley, CA Univ Science Books, (1993)
- Chapmen J R; Practical Organic Mass Spectrometry- A Guide for Chemical and Biochemical Analysis, Wiley & Sons , NY (1993)
- H.H Willard etal; Instrumental Methods of Analysis CBS Pub. and Distributors, Delhi (1986)
- Bryan L. William & Keith Wilson; Principles & Techniques of Practical Biochemistry, Edward Arnold Pub. (1975)
- Keith Wilson & John Walker; Practical Biochemistry- Principles & Techniques, 5th Ed., Cambridge University Press (2000)
- David. L. Nelson & Michael M, Cox Lenninges; Principles of Biochemistry, 4th Ed., Freeman Pub. (2005).

- Leremy M. Beig, John L. Tymoczko, Lubert Stryes; Biochemistry5th Ed., Freeman Pub. (2003)
- Genes VIII, Lewin International Edition, Pearson Prentice Hall,(2004)
- Watson Gillman, Witkowski, Zolles; Recombinant DNA, 2nd Ed., Scientific American Books, (1998)
- George M. Malacinski; Essentials of Molecular Biology, 4th Ed. Jones and Bartlet Pub. (2003).
- Daniel L. Nartl & Elizabeth W. Jones; Genetics- Principles and Analysis, 4th Ed., Jones & Bartlet Pub (1998)
- Gardnes & Snustd; Principles of Genetics 6th Ed., John Wiley & Sons (1981)
- D.M.Weir; Hand Book of Experimental Immunology, 2nd Ed., Blackwell Pub. (1973)
- Ivan M.Roett; Essential Immunology, 6th Ed., Blackwell Pub (1988).

STATISTICS AND RESEARCH METHODOLOGY

Course Code: MFS 302 **Credit Units: 04**

Course Objective:

On completion of this course the students will be able to understand the procedures in research, the different types of procedures to make the experiments viable. They get a good knowledge of the various types of analysis and how to use statistics in analyzing and interpreting the obtained data.

Course Contents:

Module I: Introduction
Statistics – its definition and uses. Experimental methods, factorial experiments on field experiment.

Module II: Sampling
Principles, methods, types of sampling, rationale for using a particular sampling procedure..

Module III: Methods of Research
Survey, experimental, Ex-post facto, case study methods, and content analysis.

Module IV: Tools of Data Collection
Observation, interview schedule, questionnaire, semantic differential.

Module V: Statistics
Introduction, Descriptive Statistics: Frequency distribution, class intervals, graphical presentation: bar diagram, histogram, pie chart; Measures of Central Tendency; measures of dispersion, Methods of correlation: Definition of correlation, Methods of correlation, skewness and Kurtosis variance, Types of correlation (Pearson r& Rho); Tests of significance.

Module IV: Statistics
Parametric and nonparametric statistics; level of significance, the various nonparametric tests with one sample, two samples and k-samples, Kruskall-Wallis ANOVA.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Broota, K.D., Experimental designs in psychological research, Wiley eastern, New York, 1992.
- Guilford, Statistics in Psychology and Education, McGraw hill, New York, 1986.
- Katz and Kahn, Research in Behavioural Sciences, Methuen, USA, 1979.
- Kerlinger, F., Foundations of Behavioural Research, Surjeet Publications, Delhi, 1983.
- Rajamanickam, M., Statistical Methods in Psychological and Educational Research, Concept Publishing Co. New Delhi, India, 1983.
- Smith, Jonathan, A. (Ed.), Qualitative Psychology: A Practical Guide to Research Methods, Sage Publications, 2003.
- Woodworth and Schlosberg, Experimental Psychology, Methuen and co. ltd, London, 1971.

COMMUNICATION SKILLS - III

Course Code: MFS 341 **Credit Units: 01**

Course Objective:

To initiate the learners with the basic mechanics of writing skills and facilitate them with the core skills required for communication in the professional world.

Course Contents:

Module I: Mechanics and Semantics of Sentences
Writing effective sentences
Style and Structure

Module II: Developing writing skills
Inter - office communication: Business Letter; E mails; Netiquette
Intra – office communication: Memos, Notices, Circulars, Minutes
Report Writing

Module III: Business Presentations
Planning, design and layout of presentation
Information Packaging
Audience analysis
Audio visual aids
Speaking with confidence
Case Studies

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.

BEHAVIOURAL SCIENCE - III
(LEADING THROUGH TEAMS)

Course Code: MFS 343 **Credit Units: 01**

Course Objective:

This course aims to enable students to:
Understand the concept and building of teams
Manage conflict and stress within team
Facilitate better team management and organizational effectiveness through universal human values.

Course Contents:

Module I: Teams: An Overview
Team Design Features: team vs. group
Effective Team Mission and Vision
Life Cycle of a Project Team
Rationale of a Team, Goal Analysis and Team Roles

Module II: Team & Sociometry
Patterns of Interaction in a Team
Sociometry: Method of studying attractions and repulsions in groups
Construction of sociogram for studying interpersonal relations in a Team

Module III: Team Building
Types and Development of Team Building
Stages of team growth
Team performance curve
Profiling your Team: Internal & External Dynamics
Team Strategies for organizational vision
Team communication

Module IV: Team Leadership & Conflict Management
Leadership styles in organizations
Self Authorized team leadership
Causes of team conflict
Conflict management strategies
Stress and Coping in teams

Module V: Global Teams and Universal Values
Management by values
Pragmatic spirituality in life and organization
Building global teams through universal human values
Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc.

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002,Harcourt College Publishers
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH - III

Course Code: MFS 344 **Credit Units: 02**

Course Objective:

To provide the students with the know-how

- To master the current social communication skills in oral and in written.
- To enrich the formulations, the linguistic tools and vary the sentence construction without repetition.

Course Contents:

Module B: pp. 76 – 88 Unité 6

Module C: pp. 89 to103 Unité 7

Contenu lexical:

Unité 6: se faire plaisir

1. acheter : exprimer ses choix, décrire un objet (forme, dimension, poids et matières) payer
2. parler de la nourriture, deux façons d'exprimer la quantité, commander un repas au restaurant
3. parler des différentes occasions de faire la fête

Unité 7: Cultiver ses relations

1. maîtriser les actes de la communication sociale courante (Salutations, présentations, invitations, remerciements)
2. annoncer un événement, exprimer un souhait, remercier, s'excuser par écrit.
3. caractériser une personne (aspect physique et caractère)

Contenu grammatical:

1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne…rien/personne/plus
4. Questions avec combien, quel…
5. expressions de la quantité
6. ne…plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec l'objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je sais que

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN - III

Course Code: MFS 345 **Credit Units: 02**

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Modal verbs
Modal verbs with conjugations and usage
Imparting the finer nuances of the language

Module II: Information about Germany (ongoing)
Information about Germany in the form of presentations or "Referat"– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

Module III: Dative case
Dative case, comparison with accusative case
Dative case with the relevant articles
Introduction to 3 different kinds of sentences – nominative, accusative and dative

Module IV: Dative personal pronouns
Nominative, accusative and dative pronouns in comparison

Module V: Dative prepositions
Dative preposition with their usage both theoretical and figurative use

Module VI: Dialogues
In the Restaurant,
At the Tourist Information Office,
A telephone conversation

Module VII: Directions
Names of the directions
Asking and telling the directions with the help of a roadmap

Module VIII: Conjunctions
To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – III

Course Code: MFS 346 **Credit Units: 02**

Course Objective:

To enable students acquire knowledge of the Set/definite expressions (idiomatic expressions) in Spanish language and to handle some Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules
Set expressions (idiomatic expressions) with the verb *Tener*, *Poner, Ir*….
Weather

Module II
Introduction to *Gustar*…and all its forms. Revision of *Gustar* and usage of it

Module III
Translation of Spanish-English; English-Spanish. Practice sentences.
How to ask for directions (using estar)
Introduction to IR + A + INFINITIVE FORM OF A VERB

Module IV
Simple conversation with help of texts and vocabulary
En el restaurante
En el instituto
En el aeropuerto

Module V
Reflexives

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras -Nivel Elemental

JAPANESE - III

Course Code: MFS 347 **Credit Units: 02**

Course Objective:

To enable the students to converse in the language with the help of basic verbs and to express themselves effectively and narrate their everyday short encounters. Students are also given projects on Japan and Japanese culture to widen their horizon further.
Note: The Japanese script is introduced in this semester.

Course Contents:

Module I: Verbs
Different forms of verbs: present continuos verbs etc

Module II
More Adverbs and adverbial expressions

Module III: Counters
Learning to count different shaped objects,

Module IV: Tenses
Past tense, Past continuous tense.

Module V: Comparison
Comparative and Superlative degree

Module VI: Wishes and desires
Expressing desire to buy, hold, possess. Usage in negative sentences as well.
Comparative degree, Superlative degree.

Module VII: Appointment
Over phone, formal and informal etc.

Learning Outcome

- Students can speak the language and can describe themselves and situations effectively
- They also gain great knowledge in terms of Japanese lifestyle and culture, which help them at the time of placements.

Methods of Private study /Self help

- Handouts, audio-aids, and self-do assignments.
- Use of library, visiting and watching movies in Japan and culture center every Friday at 6pm.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – III

Course Code: MFS 348 Credit Units: 02

Course Objective:

Foreign words are usually imported by translating the concept into Chinese, the emphasis is on the meaning rather than the sound. But the system runs into a problem because the underlying name of personal name is often obscure so they are almost always transcribed according to their pronciation alone. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Dialogue practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

Module II
Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between "hii" and "neng", "keyi".

Module III
Changing affirmative sentences to negative ones and vice versa
Human body parts.
Not feeling well words e.g. ; fever, cold, stomach ache, head ache.
Use of the modal particle "le"
Making a telephone call
Use of "jiu" and "cal" (Grammar portion)
Automobiles e.g. Bus, train, boat, car, bike etc.
Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

Module IV
The ordinal number "di"
"Mei" the demonstrative pronoun e.g. mei tian, mei nian etc.
use of to enter to exit
Structural particle "de" (Compliment of degree).
Going to the Park.
Description about class schedule during a week in school.
Grammar use of "li" and "cong".
Comprehension reading followed by questions.

Module V
Persuasion-Please don't smoke.
Please speak slowly
Praise – This pictorial is very beautiful
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast … etc.
Talking about studies and classmates
Use of "it doesn't matter"
Enquiring about a student, description about study method.
Grammar: Negation of a sentence with a verbal predicate.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I, Part-2" Lesson 21-30

SUMMER ASSIGNMENT

Course Code: MFS 360 **Credit Units: 02**

Course Objective:

Summer Assignments are being formulated with an objective to articulate the students through several sources on a particular topic for a given subject. The students will choose the topic before proceeding for the summer vacations the same work will be periodically monitored and assessed by the concerned faculties through one-to-one interaction or through e-mail, which they will submit and will be later on evaluated by the concerned faculties after the students report back to the institution. These assignments may be in the form of a small project or case study or analysis based on the secondary data available.

Examination Scheme:

Work done during the Holidays	30
Report Writing (Contents)	25
Report File	25
Viva Voce	20
Total	**100**

INTERNSHIP - I

Course Code: MFS 350 **Credit Units: 02**

Course Objective:

The Internship for students of forensic science will consist of the attachment to a FSL, CFSL, Court, Mortuary for two weeks. They would observe the forensic expert on his job as to how the investigations, are done, analysis are made and interpreted. The student is also to learn how to write the report in addition to learning the methodologies of presenting the evidence in the court.

Examination Scheme:

Work done during the Internship Period:	50
Internship Report	25
Viva Voce:	25
Total:	**100**

CELL BIOLOGY, ANATOMY, PHYSIOLOGY AND BIOCHEMISTRY

Course Code: MFS 303 **Credit Units: 04**

Course Objective:

The objective of this course is to impart complete and thorough knowledge to the students regarding the various aspects of forensic biology, the structure, functions, anatomy and physiology of different systems of the human body, the various methods of analysis and laboratory examination of different types of body fluids. The students would also be introduced to other branches of Forensic Biology like, Forensic Anthropology

Course Contents:

Module I: Cell Biology
Structure of cell and functions of different cell organelles, Differences between Prokaryotic and eukaryotic cell, different between plant cell and animal cell. Different types of Tissues and their functions.

Module II: Anatomy
Anatomy of Integumentary system, Digestive system, skeletal system, circulatory system, excretory system, endocrine system, reproductive system, respiratory system, nervous system.

Module III: Physiology
Physiology of Integumentary system, Digestive system, skeletal system, circulatory system, excretory system, endocrine system, reproductive system, respiratory system, nervous system.

Module IV: Biochemistry - I
Introduction to the Structure and Functions, biochemical properties of Carbohydrates, Proteins and Fats and test for their identification.

Module V: Biochemistry - II
Enzymes, Hormones and their functions.

Module VI: Biochemistry & Physiology of biological fluids
Composition and functions of biological fluids (Semen, saliva, urine, milk etc)

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Cell biology, I.E Celis, Academic press 2nd Edition.
- Greys Anatomy, R.L Dravce, K.L. Vogl & AVM Mitchel
- Medical Physiology, Gyton
- Text book of physiology, Chatterjee
- Medical biochemistry, Harper.
- S. Wrights, Applied Physiology
- D.A. Hoursay, Human Physiology

FORENSIC BIOLOGY

Course Code: MFS 304 **Credit Units: 04**

Course Objective:

The course is designed to expose students to the theoretical and practical aspects of forensic biology..At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of blood and body fluids.The students will be able to collect,pack and analyse different biological evidences.They will know how to document chain of custody,write laboratory reports pertaining to biological examination,conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

Module I: Botanical evidences
Different botanical evidences of forensic significance; Leaves, seeds, pollens etc

Module II: Diatoms
Diatoms: Classification, basic structure and morphology, Isolation of diatoms from various samples and forensic significance.

Module III: Fibers
Different types of fibres: natural and synthetic fibres and their properties. Location, collection and packing of fibres Microscopic examination and Chemical analysis of fibres

Module IV: Hair -I
Structure of hair and its biochemical properties, Phases of hair growth, types of hair.

Module V: Hair-II
Differences between animal and human hair, Forensic examination of different types of hair

Module VI: Introduction to Forensic Entomology
Definition and scope of Forensic entomology, stages of metamorphosis of insects.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Pandey, B. P., Plant Anatomy; S. Chand, New Delhi, 1998.
- Biology Methods manual, Metropolitan Police Forensic Science Laboratory, London, 1978.
- Byrd, J. H. & Castner, J. L., Forensic Entomology, The Utility of Arthorpods in legal Investigation, CRC Press, USA, 2000.
- Catts, E.P & Haskell N.H., Entomology and death: A procedural guide, Joyce's Print Shop, 1990.
- Mauersberger, Herbert R., & Mathews, Textile Fibres – Their physical, Microscopic and chemical properties, John Wiley, New York, 1954.
- Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
- Smith; DGV; A manual of Forensic Entomology Ithaca New York Camstock Univ. Press, USA, (1986)
- Glaister's Book of Hairs Seta: Hair

FORENSIC SEROLOGY AND DNA PROFILING

Course Code: MFS 305 **Credit Units: 04**

Course Objective:

The course is designed to expose students to the theoretical and practical aspects of forensic serology and DNA profiling. At the end of the course students will have acquired with practical experience and comprehensive knowledge of techniques presently being used in the forensic examination of body fluids. The students will be able to collect, pack and analyse blood and other body fluids. They will know how to document chain of custody, write laboratory reports pertaining to serological examination, conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

Module I: Introduction to Forensic Serology - I
Definition and scope of forensic serology. Nature, composition and functions of blood, plasma, serum. Principles of blood group inheritance of ABO, Rh,MN., Kell ,Duffy Landsteiner laws in blood group inheritance

Module II: Introduction to Forensic Serology - II
Location, Collection, preservation and packing of Biological evidences as stains and fluids. Introduction to ABO, Rh, MN and ABO grouping from body fluids and tissues. Lectins – their forensic significance, Determination of secretor/ non secretor status.

Module III: Immunology - I
Introduction to Immunology & Immune system. Types, structure, physico-chemical properties and functions of Antigens, haptenes and adjuvants.

Module IV: Immunology - II
Antibodies, Complement System. Raising of anti sera.Sterilisation procedures.Antigen and antibody reactions.

Module V: Introduction to DNA Profiling - I
DNA structure and regions , Nuclear DNA and Mitochondrial DNA • DNA biochemistry, DNA as a powerful marker to study the genetic trait,Significance of DNA profiling in relation to genotype and molecular biology, Fundamental concepts and techniques applied in specific DNA tests, Scientific principles of forensic DNA typing.Forensic significance of DNA,

Module VI: Introduction to DNA profiling - II
DNA extraction/isolation from stains (blood, semen, saliva,), tissues, hair and nails. FTA cards for isolation of DNA.DNA typing systems – length polymorphisms, short tandem repeats and single nucleotide polymorphisms

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
- Biology Methods manual, Metropolitan Police Forensic Science Laboratory, London, 1978.
- Fisher, B., Techniques of Crime Scene Investigation (6th Edn.) CRC Press, Boca Raton, Florida, 2000.
- James, S. H. And Nordby, J. J. (Eds), Forensic Science - An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003.
- James, S., and Eskerc, W., Interpretation of Blood Stain Evidence at Crime Scenes, (2nd Edn) CRC Press, Boca Raton, Florida, 1999.
- Saferstein, Richard, Criminalistics, An Introduction to Forensic Science, 6th Ed. Prentice-Hall, New Jersey, 1998.
- Blood group typing by, Danford and bowly.
- Blood grouping on man R.R. Race and Sanger.
- Blood grouping techniques, Boorman, Dodd. B, Lincoln. PB
- T Ryping of blood stains, Callifird, Bryan
- Biochemical genetics, Harris
- Forensic DNA Profiling Protocols, Patric. J. Lincoln

- Principles of blood pattern analysis, James & Kish. P.E
- Text book of Microbiology, by Dr. Anantha Narayan.
- An introduction to Forensic DNA Analysis, Inman/ Rudin
- .DNA Forensic and Legal Application, Lawrence Kobilinsky, Thomas F. Liotti
- .Forensic DNA profiling protocols, Angella Carrecedo

FORENSIC ANTHROPOLOGY

Course Code: MFS 306 **Credit Units: 04**

Course Objective:

The course is designed to expose students to the theoretical and practical aspects of forensic anthropology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of skeletal remains. The students will be able to collect, pack and analyse different bone evidences. They will know how to document chain of custody, write laboratory reports pertaining to anthroplogicla examination, conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert

Course Contents:

Module I: Introduction to Forensic anthropology
Definition and scope of forensic anthropology, Genesis and development of anthropology, Bertillons system, Portrait Parle.

Module II: **Basics of osteology**
Fundamentals of osteology. Human skeletal system and Types of bones.

Module III: Age estimation
Estimation of age from skeletons

Module IV: Identification
Determination of Species origin from bones. Site and side determination. Identification of individuals from skeletal remains

Modules V: Estimation of Stature
Estimation of Stature from skeletal remains. Anatomical methods and mathematical methods,

Module VI: Sex Determination
Determination of sex from skeletal remains

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Human skeleton in Forensic medicine; Krogman & Iscan.
- Encyclopaedia of forensic sciences, Siegel
- Introduction to forensic science. Eckert.
- Essentials of forensic medicine, Dr. K.S. Narayan Reddy.
- Gray's Anatomy.
- Text book of Osteology, Poddar.
- Martin R. & Saller, K.(1957) Lehrbouch de Anthropologie, Gustav. Fischer Verlog.
- Stewart's Forensic Anthropology

PRACTICALS – I: FORENSIC BIOLOGY AND SEROLOGY

Course Code: MFS 320 **Credit Units: 05**

Course Objective:

The course is designed to expose students to the practical aspects of forensic biology, anthropology, serology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of biological, anthropological, & serological evidences. The students will be able to collect, pack and analyse biological, anthropological, & serological evidences. They will know how to document chain of custody, write laboratory reports pertaining to the examinations conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

1. Tests for identification of stains of blood & body fluids
2. Microscopic Examination for identification of Hair
3. Determination of species of origin from hair
4. Extraction /Isolation of Diatoms from water/soil, tissues &Identification
5. Identification of bones based on its morphology and anatomical planes
6. Sex Determination from Skull, Mandible, Pelvis & long bones
7. Blood splatter analysis.

Examination Scheme:

Practical Exam:	35
Attendance:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

FORENSIC CHEMISTRY

Course Code: MFS 307 **Credit Units: 04**

Course Objective:

On the successful completion of this course, the students will understand the methods to investigate a case of arson or explosion, the kind of evidences that needs to be collected in these, the laboratory examination of the evidences and the various equipments required for their examination. The students would also learn about the various drugs of abuse and examination of organic and inorganic substances in the laboratory.

Course Contents:

Module I: Introduction to Forensic Chemistry
Forensic Chemistry: Introduction, types of cases/exhibits, preliminary screening, presumptive test (colour and spot test), inorganic analysis, micro – chemical methods of analysis

Module II: Examination of Alcohol & Alcoholic Beverages
Examination procedures involving standard methods and instrumental techniques, analysis of beverages: alcoholic and non-alcoholic, country made liquor, illicit liquor and medicinal preparations containing alcohol and drugs as constituents.

Module III: Drugs of Abuse
Introduction, classification of drugs of abuse, narcotics drugs and psychotropic substances, designer drugs and their forensic examination

Module IV: Petroleum Products
Examination of petroleum products: distillation and fractionation, various fractions and their commercial uses, standard methods of analysis of petroleum products for adulteration.

Module V: Analysis of Organic and Inorganic Substances
Quantitative and qualitative forensic analysis of organic and inorganic Industrial products, chemical fertilizers, insecticide, metallic and non metallic products, consumer items.

Module VI: Arson
Arson: chemistry of fire, investigation and evaluation of clue material, analysis of arson exhibits by various methods: Management of Arson cases,

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- A Burger; Medicinal Chemistry, Vol. II, Wiley Interscience, New York; (1970)
- A.I Vogel; Textbook of Practical Organic Chemistry including Qualitative Organic Analysis; ELBS, Essex (1971)
- Boudreau, JE et al – Arson & Arson Investigation, Survey & Assessment National Institute of Law Enforcement, U.S Deppt of Justice, US Govt. Printing Press (1977)
- D.A. Skoog, D.M. West and F.J. Holler; Analytical Chemistry: An Introduction; Saunders College Publishing, Philadephia, USA, (1994)
- Dettean, J D; Kirk's Fire Investigation, 5th ed, Prentice Hall, Eaglewood Cliffs, N.J (2002)
- F. Waltch; Principles and Methods of Chemical Analysis, 2nd Ed.; Prentice Hall; (1966)
- I.L. Finar; Organic Chemistry Vol. II; Longmans, Essex; (2003)
- J. Bassett, et.al; Vogel's Textbook of Quantitative Inorganic Analysis, 4th ed: Longman, Exxex; (1978)
- R.T. Morrison and R.N. Boyd; Organic Chemistry, (3rd Ed.); Prentice Hall, New Delhi; (1977)
- Working Procedure Manual: Chemistry, Explosives and Narcotics, BPR&D Pub (2000)
- Y. Lyalikov; Physiochemical Analysis; Mir, Moscow, USSR, (1968)
- Yinon Jitrin; The analysis of Explosives; Berbaman press, New York (1981)

FORENSIC PHARMACOLOGY, TOXICOLOGY AND PHARMACOGNOSY

Course Code: MFS 308 **Credit Units: 04**

Course Objective:

On completion of this course, the students would be able to understand the effects of various types of drugs and toxic substances encountered in an investigation. They would know the various techniques by which the toxic substances can be isolated and then analyzed to determine their type. They would also know the varied toxicological signs and symptoms of different toxins on their administration.

Course Contents:

Module I: General Pharmacology
Definitions, subdivisions and aims of Pharmacology. Concepts of drug, medicine and poison.

Module II: Poison
Poison-definition, Law relating to poison, Classification of poisons. Action of poisons & factors modifying its action, Mode of administration of poisons, routes of elimination

Module III: Toxicological activities of toxic substances - I
Corrosive poisons (Ntric acid, Hydrochloric acid, Sulphuric acid), Organic Acids (oxalic acid, salicylic acid, Carbolic acid, Hydrocyanic acid), Metallic Poisons (As, Hg, Pb) Vegetable poisons (Abrus Precatorius, Calotropis Gigantia, Castor, Marking Nut, Aconite, Ergot), Animal poisons (Snake venom, Cantharide, Insect bite)

Module IV: Toxicological activities of toxic substances - II
a).Cerebral poisons; Alcohol, Chloral Hydrate, b).Anaesthetics; Ether, Chloroform, c)Barbiturates; Barbitone, Veronal Sodium, Phenobarbitone d) Tranquilizers; Diazepam, Nitrazepam, Librium, Mandrax

Module V: Toxicological activities of toxic substances - III
Alkaloids of Dhatura, Cannabis Indica, Opium, Cocaine, Cardiac Poison: Tobacco, Digitalis, Ergot, Aconite, Spinal Poison: Nux Vomica & its alkaloids, Carbon Dioxide and Carbon Monoxide Poisoning, Radioactive substances and their poisoning.

Module VI: Pharmacognosy
Definition and aim of PHARMACOGNOSY; definition and classification of plant drug; factors affecting the activity: natural, endogenous, exogenous and preparation-dependent.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- A. Stolemen, Progress in Chemical Toxicology: Acad. Press, New York, 1963.
- Cravey, R.H., Baselt, R.C., Introduction to Forensic Toxicology, Biochemical publications, Davis C A, 1981.
- Gleason, M.N. et.al, Clinical Toxicology of Commercial products, Williams and Williams, Baltimore, USA, 1969.
- Modi, Jaishing P, Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub.2001.
- Reject Paul. M.P, Forensic Toxicology, Shiv Shakti Books Traders,2009

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FORENSIC TOXICOLOGY –I

Course Code: MFS 309 **Credit Units: 04**

Course Objective:

On completion of this course, the students would be able to understand the various types of drugs and toxic substances encountered in a\n investigation. They would know the various techniques by which these toxic substances can be isolated and then analyzed to determine their type. They would also know the varied toxicological signs and symptoms of different toxins on their administration.

Course Contents:

Module I: Toxicology
Definition of toxicology, Historical development of toxicology in India, Principle of toxicology, Classification of poisons on analytical basis and medical basis.

Module II: Isolation techniques of toxins
Isolation of Toxic substances from viscera and other relevant materials, The role of drug recognition expert, forensic problem in drug addiction and their de-addiction.

Module III: Drugs of Abuse
Sedatives, Narcotics, Stimulants and Hallucinogens, Drugs and Crime

Module IV: Drug addiction and forensic analysis
Signs and symptoms of addiction, the identification of addict, Interpreting drug findings

Module V: Toxicology of alcohol
The fate of alcohol in the body, alcohol in the circulatory system, breath test instruments, field sobriety testing, analysis of blood for alcohol

Module VI: Role of toxicologists
Significance of toxicological findings, Functions and roles of toxicologists in a forensic science laboratory. Techniques used in toxicology - Thin Layer Chromatography (TLC), Gas Chromatography (GC) and Immunoassays

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- A. Stolemen, Progress in Chemical Toxicology: Acad. Press, New York, 1963.
- Clark, E.G.C., Isolation and identification of Drugs, Vol. I and Vol. II, Academic Press, 1986.
- Connors. , A test book of Pharmaceuticals analysis, Interscience, New York, 1975.
- Cravey, R.H., Baselt, R.C., Introduction to Forensic Toxicology, Biochemical publications, Davis C A, 1981.
- Curry A.S., Analytical Methods in Human Toxicology, Part-II, 1986.
- Curry, A.S., Poison Detection in Human Organs, C. Thomas Springfield, Illinois USA, 1963.
- Gleason, M.N. et.al, Clinical Toxicology of Commercial products, Williams and Williams, Baltimore, USA, 1969.
- Modi, Jaishing P., Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub., 2001.
- Mule, S.J. et al., Immunoassays for Drugs subjects to ab, CRC Press USA, 1974.
- Sunshine, I., Guidelines for Analytical Toxicology Programme, Vol. I, CRC Press, USA, 1950.
- Sunshine, I., Guidelines for Analytical Toxicology, CRC Press USA, 1975.
- Sunshine, Methods of Analytical Toxicology, CRC Press USA, 1975.
- Reject Paul. M.P, Forensic Toxicology, Shiv Shakti Books Traders,2009

FORENSIC TOXICOLOGY – II

Course Code: MFS 310 **Credit Units: 04**

Course Objective:

On completion of this course, the students would be able to understand the various types of drugs and toxic substances encountered in a\n investigation. They would know the various techniques by which these toxic substances can be isolated and then analyzed to determine their type. They would also know the varied toxicological signs and symptoms of different toxins on their administration.

Course Contents:

Module I: Poison
Poison-definition, Law relating to poison, Drug rules and Pharmacy Acts (NDPS Act), Classification of poisons (According to symptoms), Medico legal classification of poisons, Action of poisons & factors modifying its action, Modes of administration of poisons, routes of elimination

Module II: Metallic poisons
Arsenic, Cyanide, Mercury, Bismuth. Nature, administration, symptoms, postmortem findings, Detection and medicolegal aspects.

Module III: Vegetable poisons
Abrus Precatorius, Calotropis Gigantia, Castor, Marking Nut, Oleander, Aconite, Ergot. Nature, administration, symptoms, postmortem findings, Detection and medicolegal aspects.

Module IV: Insecticides
Organophosphorous compounds, Organochloro Compounds and Carbamates- Nature, administration, symptoms, post-mortem findings, isolation, detection, estimation and medico-legal findings.

Module V: Volatile Poisons
Methyl alcohol, Chloroform, Ethyl alcohol, Acetone. Nature, administration, symptoms, post-mortem findings, isolation, detection and estimation, medico-legal findings.

Module VI: Animal Poisons
Snake venom, Cantharide, Insect bite. Nature, administration, symptoms, post-mortem findings, isolation, detection and estimation, medico-legal findings.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- A. Stolemen, Progress in Chemical Toxicology: Acad. Press, New York, 1963.
- Clark, E.G.C., Isolation and identification of Drugs, Vol. I and Vol. II, Academic Press, 1986.
- Connors, A test book of Pharmaceuticals analysis, Interscience, New York, 1975.
- Cravey, R.H., Baselt, R.C., Introduction to Forensic Toxicology, Biochemical publications, Davis C A, 1981.
- Curry A.S., Analytical Methods in Human Toxicology, Part-II, 1986.
- Curry, A.S., Poison Detection in Human Organs, C. Thomas Springfield, Illinois USA, 1963.
- Gleason, M.N. et.al, Clinical Toxicology of Commercial products, Williams and Williams, Baltimore, USA, 1969.
- Modi, Jaishing P, Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub.2001.
- Mule, S.J. et al., Immunoassays for Drugs subjects to ab, CRC Press USA, 1974.
- Sunshine, I, Guidelines for Analytical Toxicology Programme, Vol. I, CRC Press, USA, 1950.
- Sunshine, I, Guidelines for Analytical Toxicology, CRC Press USA, 1975.
- Sunshine, Methods of Analytical Toxicology, CRC Press USA, 1975.
- Working Procedure Manual – Toxicology, BPR&D Publication, 2000.
- Reject Paul. M.P, Forensic Toxicology, Shiv Shakti Books Traders,2009

PRACTICALS – I: FORENSIC CHEMISTRY AND TOXICOLOGY

Course Code: MFS 321 **Credit Units: 05**

Course Objective:

The course is designed to expose students to the practical aspects of forensic biology, anthropology, serology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of biological, anthropological, & serological evidences. The students will be able to collect, pack and analyse biological, anthropological, & serological evidences. They will know how to document chain of custody, write laboratory reports pertaining to the examinations conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

1. Isolation techniques of different toxic substances
2. Analysis of different types of drugs
3. TLC of insecticides, Barbiturates and other drugs
4. Analysis of volatile and non-volatile poisons.
5. Analysis of vegetable poisons
6. Analysis of Ethyl alcohol
7. Analysis of Methyl alcohol
8. Detection and identification of Doping materials from;
   a. Saliva
   b. Urine
   c. Blood
   d. Other body fluids and
   e. Hair

Examination Scheme:

Practical Exam:	35
Attendance:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

QUESTIONED DOCUMENTS EXAMINATION - I

Course Code: MFS 311 **Credit Units: 04**

Course Objective:

On completion of this course, the students would be able to know the different types of questioned documents, the types of forgery generally encountered, methods of their detection and examination.

Course Contents:

Module I: Introduction to Questioned Documents
Definition of document and questioned document. Classification of questioned documents

Module II: Collection of Standards
Standards for comparison, Preliminary examination of documents, selection of adequate standards

Module III: Instrumentation in Questioned Document Analysis - I
Camera, microscopes, magnifying glasses, illuminated torch, color filters, transparent glass frames, geometrical requirements, carbon paper, butter paer etc.

Module IV: Instrumentation in questioned Ducument Analysis – II
Docucenter, Dark room equipments, enlarger and various chemicals, TLC, Ppaer chromatography.

Module V: Handwriting as Part of Questioned Document
Definition of handwriting, Principles of handwriting and identification of handwriting, class and individual characteristics,

Module VI: Comparison of Handwriting samples
Disputed handwriting with specimen writings. Characteristics of genuine, forged and disguised handwritings. Natural variations and evolution of handwriting, factors affecting handwriting, court opinion and photography methods.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Albert, S. Osborn, Questioned Documents, Second Ed., Universal Law Publishing, Delhi, 1998.
- Albert, S. Osborn, The Problem of Proof, Second Ed., Universal Law Publishing, Delhi, 1998.
- Charles, C. Thomas, I.S.Q.D. Identification System for Questioned Documents, Billy Prior Bates, Springfield, Illinois, USA, 1971.
- Charles C. Thomas, Typewriting Identification I.S.Q.D.; Billy Prior Bates; Springfield, Illinois, USA, 1971.
- Hard less, H.R., Disputed Documents, handwriting and thumbs – print identification: profusely illustrated, Low Book Co., Allahabad, 1988.
- Kurtz, Sheila, Grapholypes a new plant on handwriting analysis, Crown Publishers Inc., USA, 1983.
- Lerinson, Jay, Questioned Documents, Acad Press, London, 2001.
- Morris, Ron, N., Forensic handwriting identification, Acad Press, London, 2001.
- Ordway Hilton, Scientific Examination of Questioned Documents, Rev. ED., Elsevier, New York, 1982.
- Wilson, R., Harrison, Suspect Documents – Their Scientific Examination; Universal Law Publishing, Delhi, 1997.

QUESTIONED DOCUMENTS EXAMINATION – II

Course Code : MFS 312 Credit Units: 04

Course Objective

On completion of this course, the students would be able to know the different types forgery and their identification and also about the disguised writings. Court Methods & Procedures are also covered in this paper.

Course Contents:

Module I: Types of Forgery
Freehand simulated forgery, traced forgery, impersonation, forgery by memory and transplantation. Difference between forgery and disguised writings..

Module II: Disguised Writings and Anonymous Letters
Methods of taking specimens from the suspects, comparison, elimination of innocent.

Module III: Expert Testimony
Legal provision for experts, case laws, pretrial conferencing, preparation of photographic charts, and opinions,

Module IV: Report writing and demonstration on the photographic charts with negatives
The effective methods of Report writing with proper arrow markings & juxtaposed charts.

Module V: Court Procedures -I
Preparation for examination in chief and cross examination. Methods of cross examinations of experts who has submitted wrong opinion.

Module VI: Court Procedures - II
Opinion summons for expert witness, maintenance of decorum in the court of law and moot court practice.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Albert, S. Osborn, Questioned Documents, Second Ed., Universal Law Publishing, Delhi, 1998.
- Albert, S. Osborn, The Problem of Proof, Second Ed., Universal Law Publishing, Delhi, 1998.
- Charles, C. Thomas, I.S.Q.D. Identification System for Questioned Documents, Billy Prior Bates, Springfield, Illinois, USA, 1971.
- Charles C. Thomas, Typewriting Identification I.S.Q.D.; Billy Prior Bates; Springfield, Illinois, USA, 1971.
- Hard less, H.R., Disputed Documents, handwriting and thumbs – print identification: profusely illustrated, Low Book Co., Allahabad, 1988.
- Kurtz, Sheila, Grapholypes a new plant on handwriting analysis, Crown Publishers Inc., USA, 1983.
- Lerinson, Jay, Questioned Documents, Acad Press, London, 2001.
- Morris, Ron, N., Forensic handwriting identification, Acad Press, London, 2001.
- Ordway Hilton, Scientific Examination of Questioned Documents, Rev. ED., Elsevier, New York, 1982.
- Wilson, R., Harrison, Suspect Documents – Their Scientific Examination; Universal Law Publishing, Delhi, 1997.

FORENSIC DACTYLOSCOPY

Course Code: MFS 313 **Credit Units: 04**

Course Objective:

On completion of this course, the students would acquire knowledge regarding fingerprint patterns, the different types of fingerprint classification, the various methods of fingerprint development and their recording. They would also gain knowledge regarding palm prints, sole prints and foot prints.

Course Contents:

Module I: History and Pattern of Fingerprints
History and Development of Fingerprints, formation of ridges, biological significance,

Module II: Classification of Fingerprints
Classification of fingerprints – Henry System of Classification, Single digit Classification, Extension of henery's classification, filing, searching and fingerprint bureau.

Module III: Types of Fingerprints at the scene of crime
Chance Fingerprints, Latent & Visible Fingerprints, Plastic Fingerprints

Module IV: Development of Fingerprints
Composition of Sweat, Development of latent fingerprints, conventional methods of development of fingerprints – fluorescent method, magnetic powder method, fuming method, chemical method etc.,

Module V: Recording Fingerprints
Taking of finger prints from living and dead person, preserving and lifting of fingerprints, photography of fingerprints.

Module VI: Comparison of Finger prints
Ridge counting, ridge tracing, class and individual characteristics: delta, core, bifurcation, island, cross over, bridge, ridge ending, fragment etc,

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Henry C. Lee & R. E. Ganesslen, Advances in Finger Print Technology, CRC Press, Boca Raton, London, London, 1991
- Chatterjee S.K., Speculation in Finger print Identification, Jantralekha Printing Works, Kolkata, 1981.
- Cook, Nancy, Classifying fingerprints – Innovative learning publication Mento Park 1995.
- Cowger, James F, Friction ridge skin, Comparison and Identification of fingerprints, CRC Press, Boca Raton, New York, 1993.
- David R. Ashbaugh, Quantitative and Qualitative Friction Ridge Analysis, CRC Press, 1999.
- E. Roland Menzel, Fingerprint Detection with Lasers, Second edition, Marcel Dekker, Inc. USA, 1999.
- J A Seigel, P.J Saukoo and G C Knupfer, Encyclopaedia of Forensic Sciences Vol. I, II and III, Acad. Press, 2000.
- James F. Cowger, Friction Ridge Skin CRC Press London, 1993.

IMPRESSION EVIDENCE ON CRIME SCENE

Course Code: MFS 314 Credit Units: 04

Course Objective:

On completion of this course, the students would acquire knowledge about types of impressions or imprints like those of footprints, tyre marks, ear prints, sole prints, etc.

Course Contents:

Module I: Tool marks

Types of tool marks: compression marks, striated marks, combination of compression and striated marks, repeated marks, class characteristics and individual characteristics, tracing and lifting of marks, Photographic examination of tool marks and cut marks on clothes and walls etc.

Module II: Tyre marks

Introduction, different types of tyre marks encountered, significance of tyre marks, evaluation of tyre marks: tyre width, circumference, and turning arc, skid marks etc. Evaluation of the crime skid, make and model of the vehicle.

Module III: Footwear impressions:

Mark of shoes, sandals, sleepers, socks, and alike, evaluation of foot wears impression: detection, treatment, three-dimensional casting, impression in snow, lifting and comparison.

Module IV: Palm, Sole and Foot Prints

Palm, sole and foot prints – importance, Gait pattern, Casting of footprints in different medium, electrostatic lifting of latent footprints, taking of control samples.

Module V: Comparison of palm, sole, foot & other impressions of Forensic Significance

Comparison of palm prints, sloe prints and foot impression on the basis of individual ridge characteristics
Other prints: Lip prints and Earprints, examination and its significance in Forensic Science.

Module VI: Case laws

Significance and admissibility of impression evidence in court of law, case laws, chances of error, significance of individual characteristics. Impression and corroborative evidence.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Bridges, B. C., Vollmar, A. Monir, M., Criminal Investigation, Practical Fingerprinting, Thumb Impression, Handwriting, Expert Testimony Opinion Evidence, The University Book Agency, Allahbad, 2000.
- James, S. H. and Nordby, J. J. (Eds), Forensic Science - An Introduction to Scientific and Investigation Techniques, CRC Press, London, 2003.
- Nanda, B. B., and Tewari, R. K., Forensic Science in India. Select Publishers, New Delhi, 2001.
- Saferstein, Richard, Criminalistics, An Introduction to Forensic Science, 6th Ed. Prentice-Hall, New Jersey, 1998.
- Sharma, B. R., Forensic Science in Criminal Investigation and Trials (3rd Edn) Universal Law Publishing Co. Ltd. New Delhi, 2001.
- Cossidy, M.J., Footwear Identification, Royal Canadian Mounted Police, Ontario, Canada, 1980.
- Iannarelli, A. V., Ear Identification, Forensic Identification series, Paramount, 1989

PRACTICALS – I: QUESTIONED DOCUMENTS AND FINGERPRINTS

Course Code: MFS 322 **Credit Units: 05**

Course Objective:

The course is designed to expose students to the practical aspects of forensic biology, anthropology, serology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of biological, anthropological, & serological evidences. The students will be able to collect, pack and analyse biological, anthropological, & serological evidences. They will know how to document chain of custody, write laboratory reports pertaining to the examinations conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

1. Comparison of forged (disputed) signature with the specimen signatures
2. Comparison of genuine (disputed/denied) signature with the specimen signatures
3. Comparison of disguised (disputed) signature with specimen signatures
4. Examination and comparison of disputed anonymous letter with specimen of suspect/suspects
5. Identification of altered/added/obliterated/erased/handwriting on cheques and deeds.
6. Ridge counting and ridge tracing
7. recording of prints on fingerprint chart
8. Development of latent impression
9. Development of cast of shoe prints
10. Evaluation of Foot prints and gait pattern

Examination Scheme:

Practical Exam:	35
Attendance:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

FUNDAMENTALS OF FORENSIC BALLISTICS

Course Code: MFS 315 **Credit Units: 04**

Course Objective:

On the completion of this course, the students will be able to understand the basics of the projectile motion, ballistics and role of ballistics in Forensic Science, classification of different types of firearms.

Course Contents:

Module I: Introduction to ballistics
Firearms, Indian Arms Act, Characteristic features of the firearms, various types of modern firearms

Module II: History and classification
History and Development of Firearms, Classification on firearms on different basis.

Module III: Nature and Types of firearms
Nature of firearms, various components of small arms, smooth bore and rifled firearm, different types of mechanisms used in firearms.

Module IV: Bore Characteristics
Smooth bore weapon, Rifling, purpose of rifling, types of rifling and methods of producing rifling. Improvised/ country-made/ imitative firearms and their constructional features

Module V: Ammunition I - Cartridges
Definition, Classification and constructional features of different types of ammunitions (cartridges), types of primers and priming composition, propellants and their compositions,

Module VI: Ammunition II - Bullets
Various types of bullets and their compositional aspects, latest trends in their manufacturing and design, smooth bore and improvised ammunition, safety aspects for handling Firearms and ammunition.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Brain J. Heard; Hand book of Firearms and Ballistics; John Willey, England, 1997.
- Gary J. Ordog, Management of Gunshot Wounds; Elsevier, New York, 1983.
- Hatcher, Jury and Weller; Firearms Investigation, Identification and Evidence; Stackpole Books, Harrisburg, PA, 1977.
- I.V. Hogg; The Cartridges Guide – A small arms Ammunition Identification Mannual; The Stackpole Co., Harrisburg, PA., 1982.
- J. Howard Mathews; Charles C. Thomas, Firearms Identification, Vols, 1, 2 & 3; Springfield, Illinois, 1973.
- Karl G. Sellier et al; Wound Ballistics and The Scientific Background; Elsevier, London, 1994.
- M. Johari, Identification of Firearm, Ammunition and Firearms Injuries; BPR&D, New Delhi 1980.
- TA. Warlow; Firearms, The Law and Forensic Ballistics; Taylor and Francis, London, 1996.
- Vincent Di Maio, Gunshot Wounds; CRC Press, Washington, DC; 1999.

INTERNAL, EXTERNAL AND TERMINAL BALLISTICS

Course Code: MFS 316 **Credit Units: 04**

Course Objective:

On the completion of this course, the students will be able to understand the theories of internal, external and terminal ballistics. The student will be able to learn the projectile motion, trajectories and factors affecting the trajectories.

Course Contents:

Module I: Internal Ballistics - I
Definition, energy consideration, initiation, trigger and firing mechanism, ignition of propellants, types of propellant, shape and size of propellants, manner of burning of propellant.

Module II: Internal Ballistics - II
Various factors affecting the internal ballistics: lock time, ignition time, barrel time, erosion, corrosion and gas cutting, Heat problems, velocity and pressure characteristics under different conditions, determination of pressure, recoil and theory of recoil, vibration and jump.

Module III: External Ballistics - I
Definition, projectile motion in air and vacuum, equation of motion of projectile, vacuum trajectories, Factors affecting external ballistics: range, drop, angle of fall, remaining velocity, limiting velocity. Ballistics coefficient and Ballistic tables, measurements of trajectory parameters.

Module IV: External Ballistics - II
Effect of air resistance on trajectory, sectional density, gravitational pull, wind deflection, base drag, yaw, shape of projectile and stability, shape of trajectory and trajectory computation

Module V: Terminal Ballistics - I
Definition, effect of projectile on hitting the target: function of bullet shape, striking velocity, striking angle and nature of target, tumbling of bullets

Module VI: Terminal Ballistics - II
Effect of instability of bullet, effect of intermediate targets, influence of range, Cavitations – temporary and permanent cavities, Ricochet and its effects, stopping power.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Brain J. Heard; Hand book of Firearms and Ballistics; John Willey, England, 1997.
- Gary J. Ordog, Management of Gunshot Wounds; Elsevier, New York, 1983.
- Hatcher, Jury and Weller; Firearms Investigation, Identification and Evidence; Stackpole Books, Harrisburg, PA, 1977.
- I.V. Hogg; The Cartridges Guide – A small arms Ammunition Identification Mannual; The Stackpole Co., Harrisburg, PA., 1982.
- J. Howard Mathews; Charles C. Thomas, Firearms Identification, Vols, 1, 2 & 3; Springfield, Illinois, 1973.
- Karl G. Sellier et al; Wound Ballistics and the Scientific Background; Elsevier, London, 1994.
- M. Johari, Identification of Firearm, Ammunition and Firearms Injuries; BPR&D, New Delhi 1980.
- TA. Warlow; Firearms, The Law and Forensic Ballistics; Taylor and Francis, London, 1996.
- Vincent Di Maio, Gunshot Wounds; CRC Press, Washington, DC; 1999.

BASIC CONCEPT OF EXPLOSIVES

Course Code: MFS 317 **Credit Units: 04**

Course Objective:

On the successful completion of this course, the students will understand the methods to investigate a case of arson or explosion, the kind of evidences that needs to be collected in these, the laboratory examination of the evidences and the various equipments required for their examination.

Course Contents:

Module I: Arson and Investigation
Arson: chemistry of fire, investigation and evaluation of clue material, analysis of arson exhibits by instrumental methods: Management of Arson cases.

Module II: Introduction to Explosives - I
Explosive Act, nature and classification, composition and characteristics of explosives, pyrotechnics, IEDs,

Module III: Introduction to Explosives - II
Explosion process and affects, types of hazard, effect of blast wave on structures, human etc.

Module IV: Assessment and Thermochemistry of Explosives
Sensitiveness test, determination of explosive power, thermochemistry of explosives, oxygen balance, heat of explosion, effect of oxygen balance, explosive power and power index, temperature of chemical explosion.

Module V: Mixed Explosive Compositions
Atomic composition of explosive mixture, oxygen balance, decomposition reaction, heat of explosion, volume of gaseous products,

Module VI: Energized explosives
Energized explosives, addition of aluminium, force and pressure of explosion, temperature of explosion.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Boudreau, JE et al – Arson & Arson Investigation, Surevey & Assessment National Institute of Law Enforcement, U.S Deppt of Justice, US Govt. Printing Press (1977)
- D.A. Skoog, D.M. West and F.J. Holler; Analytical Chemistry: An Introductin; Saunders College Publishing, Philadephia, USA, (1994)
- Dettean, J D; Kirk's Fire Investigation, 5th ed, Prentice Hall, Eaglewood Cliffs, N.J (2002)
- Working Procedure Manual: Chemistry, Explosives and Narcotics, BPR&D Pub (2000)
- Y. Lyalikov; Physiochemical Analysis; Mir, Moscow, USSR, (1968)
- Yinon Jitrin; The analysis of Explosives; Berbaman press, New York (1981)

DEVELOPMENT, CLASSIFICATION AND ANALYSIS OF EXPLOSIVES

Course Code: MFS 318 **Credit Units: 04**

Course Objective:

On the successful completion of this course, the students will understand the methods to investigate a case of arson or explosion, the kind of evidences that needs to be collected in these, the laboratory examination of the evidences and the various equipments required for their examination.

Course Contents:

Module I: Development of Explosives-I
Development of black powder, nitroglycerine, mercury fulminate, nitrocellulose, dynamite, ammonium nitrate, ANFO.

Module II: Development of Explosives-II
Development of military explosives: picric acid, tetryl, TNT, PETN, RDX and HMX

Module III: Classification of Explosives
Primary explosives: lead azide, lead styphnate, mercury fulminate, tetrazene. Secondary explosives: TNT, RDX, PETN, Tetrayl, Gelatines, powders, ANFO, emulsion slurries.

Module IV: Propellants
Blackpowder, single-base, double-base, triple-base, liquid fuels and oxidizers.

Module V: Detonators and Explosives
Introduction, plain and electric detonators, delay detonators, detonating and safety fuse, high explosive mixtures

Module VI: Instrumental techniques in Explosive residue analysis
Chromatographic techniques: TLC, HPLC, Ion chromatography. Mass spectrometry, chemical examination.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- D.A. Skoog, D.M. West and F.J. Holler; Analytical Chemistry: An Introductin; Saunders College Publishing, Philadephia, USA, (1994)
- Dettean, J D; Kirk's Fire Investigation, 5th ed, Prentice Hall, Eaglewood Cliffs, N.J (2002)
- Working Procedure Manual: Chemistry, Explosives and Narcotics, BPR&D Pub (2000)
- Y. Lyalikov; Physiochemical Analysis; Mir, Moscow, USSR, (1968)
- Yinon Jitrin; The analysis of Explosives; Berbaman press, New York (1981)

PRACTICALS – I: FORENSIC BALLISTICS AND EXPLOSIVES

Course Code: MFS 322 **Credit Units: 05**

Course Objective:

The course is designed to expose students to the practical aspects of forensic biology, anthropology, serology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of biological, anthropological, & serological evidences. The students will be able to collect, pack and analyse biological, anthropological, & serological evidences. They will know how to document chain of custody, write laboratory reports pertaining to the examinations conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

1. Study the characteristic features of the firearm- caliber, choke and proof marks
2. Identification of propellant, powder residue (walker's test) and barrel wash
3. Study of wound ballistics from different firearms.
4. Determination of direction of firing on the basis of firearm injury.
5. Determination of position of firer
6. Analysis of explosive residues (Qualitative)
7. Examination of petroleum products such as Petrol, HSD, Kerosene as per BIS specifications.

Examination Scheme:

Practical Exam:	35
Attendance:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

COMMUNICATION SKILLS - IV

Course Code: MFS 441 **Credit Units: 01**

Course Objective:

To facilitate the learner with Academic Language Proficiency and make them effective users of functional language to excel in their profession.

Course Contents:

Module I: Introduction to Speaking Skills
Business Conversation
Effective Public Speaking
Art of Persuasion

Module II: Speaking for Employment
Types of Interview
Styles of Interview
Facing Interviews-Fundamentals and Practice Session
Conducting Interviews- Fundamentals and Practice Session
Question Answer on Various Dimensions

Module III: Basic Telephony Skills
Guidelines for Making a Call
Guidelines for Answering a Call
Telephone Word Groups
Answering Systems and Voice-Mail

Module IV: Work Place Speaking
Team Briefing
Conflict Management
Negotiations
Participation in Meetings
Keynote Speeches

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Jermy Comfort, Speaking Effectively, et.al, Cambridge
- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.
- Taylor, Conversation in Practice.

BEHAVIOURAL SCIENCE - IV
(PERSONAL AND PROFESSIONAL EXCELLENCE)

Course Code: MFS 443 **Credit Units: 01**

Course Objective:

This course aims at imparting an understanding of:
Build and leverage your professional reputation
Maintain focus in pressure situations
Make a balanced choice between professional and personal commitments

Course Contents:

Module I: Individual, Society and Nation
Individual Differences and Dimensions of Personality
Socialization Process
Relating to the Nation: Values, Culture, Religion
Sense of pride and Patriotism
Managing Diversity

Module II: Components of Excellence
Personal Excellence:
Identifying long-term choices and goals
Uncovering the talent, strength & style
Analyzing choke points in your personal processes by analysis in area of placements, events, seminars, conference, extracurricular activities, projects etc.
Developing professional power: Goal-setting, time management, handling criticism, interruptions and time wasters

Module III: Career Planning
Knowing one's Interest and Aptitude
Identifying available Resources
Setting goals to maintain focus:
Developing Positive attributes in personality
Self-reliance and Employability skills

Module IV: Stress Management for Healthy Living
Meaning and Nature of Stress
Stages of stress
Causes and Consequences of stress: Personal, Organizational and Environmental
Personal Styles and strategies of coping

Module V: Professional Success
Building independence & interdependence
Reducing resistance to change
Continued reflection (Placements, events, seminars, conferences, projects extracurricular Activities etc.)

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers
- Raman, A.T. (2003) Knowledge Management: A Resource Book. Excel Books, Delhi.
- Kamalavijayan, D. (2005). Information and Knowledge Management. Macmillan India Ltd. Delhi

FRENCH - IV

Course Code: MFS 444 **Credit Units: 02**

Course Objective:

To enable students:

- To develop strategies of comprehension of texts of different origin
- To present facts, projects, plans with precision

Course Contents:

Module C: pp. 104 – 139: Unités 8, 9

Contenu lexical:

Unité 8: Découvrir le passé

1. parler du passé, des habitudes et des changements.
2. parler de la famille, raconter une suite d'événements/préciser leur date et leur durée.
3. connaître quelques moments de l'histoire

Unité 9: Entreprendre

1. faire un projet de la réalisation: (exprimer un besoin, préciser les étapes d'une réalisation)
2. parler d'une entreprise
3. parler du futur

Contenu grammatical:

1. Imparfait
2. Pronom « en »
3. Futur
4. Discours rapporté au présent
5. Passé récent
6. Présent progressif

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN - IV

Course Code: MFS 445 **Credit Units: 02**

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany.
Introduction to Advanced Grammar Language and Professional Jargon

Course Contents:

Module I: Present perfect tense
Present perfect tense, usage and applicability
Usage of this tense to indicate near past
Universal applicability of this tense in German

Module II: Letter writing
To acquaint the students with the form of writing informal letters.

Module III: Interchanging prepositions
Usage of prepositions with both accusative and dative cases
Usage of verbs fixed with prepositions
Emphasizing on the action and position factor

Module IV: Past tense
Introduction to simple past tense
Learning the verb forms in past tense
Making a list of all verbs in the past tense and the participle forms

Module V: Reading a Fairy Tale
Comprehension and narration
Rotkäppchen
Froschprinzessin
Die Fremdsprache

Module VI: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module VII: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module VIII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH - IV

Course Code: MFS 446 **Credit Units: 02**

Course Objective:

To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules
Introduction to Present Continuous Tense (Gerunds)

Module II
Translation with Present Continuous Tense
Introduction to Gustar, Parecer, Apetecer, doler

Module III
Imperatives (positive and negative commands of regular verbs)

Module IV
Commercial/ business vocabulary

Module V
Simple conversation with help of texts and vocabulary
En la recepcion del hotel
En el restaurante
En la agencia de viajes
En la tienda/supermercado

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras (Nivel – Elemental)

JAPANESE - IV

Course Code: MFS 447 **Credit Units: 02**

Course Objective:

To enable the students to comfortably interact using basic Japanese.
Note: Teaching is done in roman as well as Japanese script, students will be taught katankana (another form of script) in this semester i.e. to be able to write all the foreign words in Japanese.

Course Contents:

Module I
Comparison using adjectives, making requests

Module II
Seeking permission

Module III
Practice of conversations on:
Visiting people, Party, Meetings, after work, at a ticket vending machine etc

Module IV
Essays, writing formal letters

Learning Outcome

- Students can speak the language describing above-mentioned topics.

Methods of Private study/ Self help

- Handouts, audio-aids, and self-do assignments, role-plays.
- Students are also encouraged to attend Japanese film festival and other such fairs and workshops organized in the capital from time to time.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – IV

Course Code: MFS 448 Credit Units: 02

Course Objective:

How many characters are there? The early Qing dynasty dictionary included nearly 50,000 characters the vast majority of which were rare accumulated characters over the centuries. An educate person in China can probably recognize around 6000 characters. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Dialogue Practice
Observe picture and answer the question
Pronunciation and intonation
Character writing and stroke order.
Electronic items

Module II
Traveling – The Scenery is very beautiful
Weather and climate
Grammar question with – "bu shi …. Ma?"
The construction "yao … le" (Used to indicate that an action is going to take place)
Time words "yiqian", "yiwai" (Before and after).
The adverb "geng".

Module III
Going to a friend house for a visit meeting his family and talking about their customs.
Fallen sick and going to the Doctor, the doctor examines, takes temperature and writes prescription.
Aspect particle "guo" shows that an action has happened some time in the past.
Progressive aspect of an actin "zhengzai" Also the use if "zhe" with it.
To welcome someone and to see off someone …. I cant go the airport to see you off… etc.

Module IV
Shipment. Is this the place to checking luggage?
Basic dialogue on – Where do u work?
Basic dialogue on – This is my address
Basic dialogue on – I understand Chinese
Basic dialogue on – What job do u do?
Basic dialogue on – What time is it now?

Module V
Basic dialogue on – What day (date) is it today?
Basic dialogue on – What is the weather like here.
Basic dialogue on – Do u like Chinese food?
Basic dialogue on – I am planning to go to China.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader, Part-2" Lesson 31-38

INTERNSHIP - II

Course Code: MFS 450 **Credit Units: 02**

Course Objective:

The Internship for students of forensic science will consist of the attachment to a FSL, CFSL, Court, Mortuary for two weeks. They would observe the forensic expert on his job as to how the investigations, are done, analysis are made and interpreted. The student is also to learn how to write the report in addition to learning the methodologies of presenting the evidence in the court.

Examination Scheme:

Work done during the Internship Period:	50
Internship Report:	25
Viva Voce:	25
Total:	**100**

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DISSERTATION

Course Code: MFS 455 Credit Units: 12

The students will be required to undertake a research project in the field of the forensic biology/serology in the area of interest to the student. This should be done in consultation with the faculty supervisor and agency supervisor under whom he / she is getting trained. The project report will be around 100 pages and should have chapterization as follows:

Chapter I: Introduction
Chapter II: Review of Literature
Chapter III: Methodology
Chapter IV: Data Analysis and Results
Chapter V: Discussion of Results
Chapter VI: Summary and Conclusion

The research should be original and should be action oriented in that the results should be able to throw light on some of the important unexplored areas that would be of practical use to the forensic experts.

Examination Scheme:

External Examiner:	30
Internal Examiner:	30
Viva Voce (External Examiner)	20
Viva Voce (Internal Examiner)	20
Total:	**100**

The students will be required to submit a Dissertation based on the experimental work carried out in the laboratory on a problem assigned by the teacher (Supervisor)

ADVANCED FORENSIC BIOLOGY

Course Code: MFS 401 **Credit Units: 05**

Course Objective:

The course is designed to expose students to the theoretical and practical aspects of forensic biology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of blood and body fluids. The students will be able to collect, pack and analyse different biological evidences. They will know how to document chain of custody, write laboratory reports pertaining to biological examination, conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

Module I: Forensic Entomology
Collection of insects from the body at the scene, Scene observations and weather data; Collection of insects after body removal; Shipment of collected insects, Identification of insect and its stage of growth. Determination of the postmortem interval or "time since death" in homicide investigations, forensic entomotoxicology.

Module II: Animal Wild Life Forensics – Introduction to wildlife forensics, Endangered species of wild animals, Identification of animals through examination of pug marks, horn, skin, fur, hair, nail and teeth., DNA.

Module III: Plant Wild Life Forensics
Endangered species of wild plants, Identification of plants through identification of wood, flowers, seeds, pollen grains, DNA. Wildlife life protection Act.

Module IV: Wood Identification
Types of wood (Angiosperms and gymnosperms), methods of Forensic Wood identification

Modules V: Paper Identification
Microscopic and chemical examination of Paper and pulp materials and its forensic importance

Module VI: Forensic Microbiology
Introduction to forensic microbiology, agents of bioterrorism and biowarfare and some relevant case studies.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
- Biology Methods manual, Metropolitan Police Forensic Science Laboratory, London, 1978.
- Pandey, B. P., Plant Anatomy; S. Chand, New Delhi, 1998.
- Byrd, J. H. & Castner, J. L., Forensic Entomology, The Utility of Arthorpods in legal Investigation, CRC Press, USA, 2000.
- Catts, E.P & Haskell N.H., Entomology and death: A procedural guide, Joyce's Print Shop, 1990.
- Bioterrorism and biological warfare: Prof A.L. Bhatia & Prof S.K. Kulshrestha
- Smith; DGV; A manual of Forensic Entomology Ithaca New York Camstock Univ. Press, USA, (1986)

ADVANCED FORENSIC ANTHROPOLOGY

Course Code: MFS 402 **Credit Units: 05**

Course Objective:

The course is designed to expose students to the theoretical and practical aspects of forensic anthropology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of skeletal remains. The students will be able to collect, pack and analyze different bone evidences. They will know how to document chain of custody, write laboratory reports pertaining to anthropological examination, conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert

Course Contents:

Module I: Anthropometry
Somatometry and somatoscopy, osteometry & Craniometry

Module II: Bone modifications
Fire modification of bones and effects of chemicals, and different physical agents,
Artefacts in the skeletal remains due to animal predation.

Module III: Forensic taphonomy and injury assessment
Forensic Taphonomy. Assessment of antemortem and postmortem skeletal trauma.

Module IV: Forensic radiology
Application of radiology in forensic anthropology.

Module V: Super Imposition &Facial reconstruction
Photographic, video graphic, radiological superimposition techniques, Facial reconstruction-two dimensional , three dimensional using clay, plaster of paris, plasticine etc.) and computer assisted facial reconstruction

Module VI: Handling of bone evidence
Collection, Handling, preservation of skeletal remains of forensic science and report writing.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Human skeleton in Forensic medicine; Krogmen & Iscan.
- Encyclopaedia of forensic sciences, Siegel
- A annual of biological anthropology, Singh & Bhasin.
- Anthropometry, Bhasin
- Introduction to forensic science. Eckert.
- Modi's Medical Jurisprudence and Toxicology,23rd Edition, by K. Mathiharan & Amrit K. Patnaik, Third reprint,2009,LexisNexis,Butterworth,New Delhi
- Essentials of forensic medicine, Dr. K.S. Narayan Reddy.
- Gray's Anatomy.
- Text book of Osteology, Poddar.
- Advances in Forensic Taphonomy: method, theory and archeological perspectives by Haglund
- Forensic radiology: Brogdon

ADVANCED FORENSIC SEROLOGY AND DNA PROFILING

Course Code: MFS 403 **Credit Units: 05**

Course Objective:

The course is designed to expose students to the theoretical and practical aspects of forensic serology and DNA profiling. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of blood and body fluids. The students will be able to collect, pack and analyse blood and other body fluids. They will know how to document chain of custody, write laboratory reports pertaining to serological examination, conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

Module I: Forensic charecterisation of blood

Catalytic tests & crystal tests, Spectrophotometric method, chromatographic method, immunological methods, electrophoresis methods. Typing of blood antigens from dried stains. Lattes test, Absoption Elution, Absorption Inhibition, Mixed agglutination.

Module II: Forensic charecterisation body fluids

Forensic charecterisation of menstrual blood, semen, saliva, urine, faeces, milk and other biological fluids. Methods to handle, analyse and identify the biological fluids using the most advanced instruments in practice. Separation of endogenous as well as administered substances with the use of auto analyzer, like sperm counter, motility and morphology readers of sperm.

Module III: Determination of Species of origin

Introduction to species origin. Determination of species origin. Extraction from blood stains, calcified keratinized tissues and soft tissues and other body fluids .Tube technique (Precipitin test/Ring test).Cross reactivity. Diffusion methods; single diffusion, double diffusion, and crossed-over electrophoresis, rocket electrophoresis.

Module IV: Serogenetic Markers

Introduction to isozymes and Polymorphic proteins. Typing of isozymes, like Phospho Glucomutase (PGM), Glyoxylase I(GLO), Esterase D(EsD), Erythrocyte Acid Phosphatase (EAP), Adenylate Kinase (AK) ,Adenosine Deaminase (ADA). Typing of polymorphic serum proteins like Haptoglobin(Hp)&Transferrin (Tf) Introduction to Human Leucocyte Antigen. HLA Classification, HLA typing, Forensic significance of serogenetic markers in individualization, paternity disputesand population studies etc. Use of ELISA, RIA, RAST, Immuno fluorescence, in forensic serology.

Module V: DNA Profiling-III

VNTR, HLA-DQα, STRs, RFLP(restriction fragment length polymorphisms), RFLP analysis ,Analysis of SNP, Y-STR, Mitochondrial DNA, PCR amplifications, sequence polymorphism. Southern blotting, radioactive probes, Hybrization, visualization, Evaluation of results, Frequency estimate calculations, Interpretation, Allele frequency determination, Match probability .

Module VI: DNA Profiling-IV

Single locus DNA profiling, multi – locus DNA profiling, Mini satellite, micro-satellite,
DNA chips, SNPS, DNA cloning, limitations of DNA profiling. Forensic applications of DNA profiling

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Richard Saferstein; Forensic Science Hand Book; Ed.; Prentice – Hall, Englewood Cliff, New jersey; (1982)
- Biology Methods manual, Metropolitan Police Forensic Science Laboratory, London, 1978.
- Fisher, B., Techniques of Crime Scene Investigation (6th Edn.) CRC Press, Boca Raton, Florida, 2000.
- James, S. H. And Nordby, J. J. (Eds), Forensic Science - An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003.

- James, S., and Eskerc, W., Interpretation of Blood Stain Evidence at Crime Scenes, (2nd Edn) CRC Press, Boca Raton, Florida, 1999.
- Saferstein, Richard, Criminalistics, An Introduction to Forensic Science, 6th Ed. Prentice-Hall, New Jersey, 1998.
- Blood group typing by, Danford and Bowly.
- Blood grouping on man R.R. Race and Sanger.
- Blood grouping techniques, Boorman, Dodd. B, Lincoln. PB
- Typing of blood stains, Callifird, Bryan
- Biochemical genetics, Harris
- Forensic DNA Profiling Protocols, Patric. J. Lincoln
- Principles of blood pattern analysis,James&Kish.P.E
- Text book of Microbiology, by Dr. Anantha Narayan.
- An introduction to Forensic DNA Analysis, Inman/ Rudin
- .DNA Forensic and Legal Application, Lawrence Kobilinsky, Thomas F. Liotti
- .Forensic DNA profiling protocols, Angella Carrecedo

PRACTICALS – II: FORENSIC BIOLOGY AND SEROLOGY

Course Code: MFS 420 **Credit Units: 04**

Course Objective:

The course is designed to expose students to the practical aspects of forensic biology, anthropology, serology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of biological, anthropological, & serological evidences. The students will be able to collect, pack and analyse biological, anthropological, & serological evidences. They will know how to document chain of custody, write laboratory reports pertaining to the examinations conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

1. Confirmatory tests for blood and body fluids
2. Microscopic Examination of Hair for the determination of blood groups,enzyme types and hair proteins
3. Craniometry & Osteometry
4. Somatometry & Somatoscopy
5. Stature estimation from bones
6. Age Estimation from Skull,Mandible,,Long bones
7. Precipitin test
8. Gel Immuno Diffusion tests for species origin
9. Immuno Electrophoresis (Crossed over Electrophoresis, Rocket Electrophoresis
10. Blood grouping from dried stains by Absorption Inhibition ,Absorption Elution, &Mixed Agglutination
11. Typing for Isozymes.
12. Typing for serum protein
13. Sexing from Barr Bodies.
14. Sexing from Y-body fluorescence

Examination Scheme:

Practical Exam:	35
Attendance:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

ADVANCED FORENSIC CHEMISTRY

Course Code: MFS 404 **Credit Units: 05**

Course Objective:

The students will learn about the various types of explosives used, their investigation and the various acts related to drugs. They will also understand the investigation of Fire related cases and the role of expert witnesses.

Course Contents:

Module I: Explosives - I
Classification, composition and characteristics of explosives, pyrotechnics, IEDs, explosion process and affects, types of hazard, effect of blast wave on structures, human etc., specific approach to scene of explosion, post-blast residue collection, Reconstruction of sequence of events

Module II: Explosives - II
Evaluation and assessment of scene of explosion, systematic examination of explosives and explosion residues in the laboratory using chemical and instrumental techniques in the laboratory and interpretation of results, Explosives Act.

Module III: Acts related to Drugs
Drugs and Cosmetic Act, Excise Act, NDPS Act.

Module IV: Fire and Explosion Investigation
Chemistry and Behavior of fire, origin and cause and their methods of investigation

Module V: Motor Vehicle Fires
Causes, investigation, collection, preservation, packaging and analysis of evidences

Module VI: Expert Witness
The role of Chemist as an expert witness. Presentation of the report in the court, Cross-examination of the expert

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Carper, K. (ed.), Forensic Engineering, 2nd Edn. CRC Press, Bocarida, Florida, 2001.
- Field, J., and Carper, K., Construction Failure, 2nd Edn. John Wiley and Sons, New York, 1996.
- James, S.H. and Nordby, J.J. Eds., Forensic Science An Introduction to Scientific and Investigative Techniques, CRC Press, London, 2003.
- SAE Handbook, Vol. 4, On-Hghway and Off-Highway Machinery, Society of Auto mobile Engineers, 2000

ADVANCED FORENSIC PHARMACOLOGY AND PHARMACOGNOSY

Course Code: MFS 405 **Credit Units: 05**

Course Objective:

The students will learn about the mechanism of action of drugs in the body, their interaction with the various components of the body and the various methods of detecting it.

Course Contents:

Module I: Pharmacodynamics-I
Sites and mechanisms of action of drugs; Receptor classification, Drug-receptor interactions and signal transduction mechanisms.

Module II: Pharmacodynamics-II
Dose-effect relationships; agonists, partial agonists and antagonists.

Module III: Pharmacodynamics-III
Factor that modify drug actions; side effects, overdose, idyosincratic and allergic reactions; teratogenesis and foetal toxicity. Variability of drug effects: factors depending on the drug, on the patient, on the treatment schedule. Drug interactions.

Module IV: Pharmacokinetics-I
The movement of drug molecules across cell membranes, the blood-brain barrier and the placental filter. Routes of administration and drug adsorption. Binding to plasma proteins.

Module V: Pharmacokinetics-II
Drug distribution, metabolism and elimination. Drug bioavailability and half-life. Pharmacokinetic parameters evaluation. Time course of of drug plasma concentrations after single and repeated administrations.

Module VI: Pharmacognosy
Plant drug: conditions of preservation, analysis, identification, quality control, distinctive characters, endogenous active substances, therapeutic strategies, toxic effects.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Text book of pharmacology, Lawrence
- A. Stolemen, Progress in Chemical Toxicology: Acad. Press, New York, 1963.
- Clark, E.G.C., Isolation and identification of Drugs, Vol. I and Vol. II, Academic Press, 1986.
- Cravey, R.H., Baselt, R.C., Introduction to Forensic Toxicology, Biochemical publications, Davis C A, 1981.
- Gleason, M.N. et.al, Clinical Toxicology of Commercial products, Williams and Williams, Baltimore, USA, 1969.
- Modi, Jaishing P, Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub.2001.
- Working Procedure Manual – Toxicology, BPR&D Publication, 2000.

ADVANCED FORENSIC TOXICOLOGY - I

Course Code: MFS 406 **Credit Units: 05**

Course Objective:

The students will learn about the various techniques of isolation of different toxic substances, their detection based on the different class of poisons.

Course Contents:

Module I: Isolation techniques of toxins-I
Definition of toxicology, Historical development of toxicology, Principles of toxicology, classification of poisons, Isolation of toxic substances from viscera and other relevant materials- Non-volatile organic poisons.

Module II: Isolation techniques of toxins-II
Dry Ashing & Wet Digestion Methods, Toxic Anions, Dialysis Methods, Total Alcoholic Extract.

Module III: General study and analysis of some drugs/toxins
Barbiturates, Meprobamate, Methaquolone, Mescaline, Amphetamine, LSD, Diazepam, Phenothiazines, Morphine, Heroin, Cannanoids, Insecticides (organochloro, opganophosphorous, and carbamides), cocaine, Benzodiazepines, PCP (Phenylcyclidine).

Module IV: Isolation and analysis of vegetable poisons
Abrus Precatorius, Calotropis Gigantia, Cyanogenetic Glycosides, Croton, Castor, Opium, Cannabis Indica, Dhatura, Marking Nut, Nux Vomica, Oleander, Aconite, Ergot, Digitalis

Module V: Isolation and analysis of cations & Volatile poisons in viscera
Metallic Ions: Pb, As, Hg, Bi, Mn, Sn, Sb, Zn, Cu, Fe, Ba
Analysis of ethyl alcohol in body fluids, Analysis of methanol, acetone, chloroform, phenol

Module VI: Laboratory examination of Inflammable liquids
Kerosene, diesel, gasoline, light naphtha, solid chemical incendiaries.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- A. Stolemen, Progress in Chemical Toxicology: Acad. Press, New York, 1963.
- Clark, E.G.C., Isolation and identification of Drugs, Vol. I and Vol. II, Academic Press, 1986.
- Connors, A test book of Pharmaceuticals analysis, Interscience, New York, 1975.
- Cravey, R.H., Baselt, R.C., Introduction to Forensic Toxicology, Biochemical publications, Davis C A, 1981.
- Curry A.S., Analytical Methods in Human Toxicology, Part-II, 1986.
- Curry, A.S., Poison Detection in Human Organs, C. Thomas Springfield, Illinois USA, 1963.
- Gleason, M.N. et.al, Clinical Toxicology of Commercial products, Williams and Williams, Baltimore, USA, 1969.
- Modi, Jaishing P, Textbook of Medical Jurisprudence & Toxicology, M.M. Tripathi Pub.2001.
- Mule, S.J. et al., Immunoassays for Drugs subjects to ab, CRC Press USA, 1974.
- Sunshine, I, Guidelines for Analytical Toxicology Programme, Vol. I, CRC Press, USA, 1950.
- Sunshine, I, Guidelines for Analytical Toxicology, CRC Press USA, 1975.
- Sunshine, Methods of Analytical Toxicology, CRC Press USA, 1975.
- Working Procedure Manual – Toxicology, BPR&D Publication, 2000.
- Reject Paul. M.P, Forensic Toxicology, Shiv Shakti Books Traders,2009

PRACTICALS – II: FORENSIC CHEMISTRY AND TOXICOLOGY

Course Code: MFS 421 **Credit Units: 04**

Course Objective:

The course is designed to expose students to the practical aspects of forensic biology, anthropology, serology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of biological, anthropological, & serological evidences. The students will be able to collect, pack and analyse biological, anthropological, & serological evidences. They will know how to document chain of custody, write laboratory reports pertaining to the examinations conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

1. Spot test of nitrates, nitrites, carbonates, sulphates, sulphites, chlorates
2. Spot test of mercury, iron, copper, Aluminum and cadmium and zinc and other metallic poisons.
3. TLC of metallic components
4. Instrumental analysis of dugs or toxic substances using UV-Vis spectrophotometer and colorimeter
5. Identification and Estimation of alcohol using Gas Liquid Chromatography
6. Identification of the alkaloids of Opium
7. Identification of alkaloids of Cannabis
8. Identification of Benzodiazepines, Amphetamines, by chemical and instrumental Methods

Examination Scheme:

Practical Exam:	35
Attendance:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

ADVANCED QUESTIONED DOCUMENTS EXAMINATION - III

Course Code: MFS 407 **Credit Units: 05**

Course Objective:

On completion of this course, the students would acquire knowledge regarding the comprehensive documents, electronic documents, the various methods of fingerprint development and their recording. They would also gain knowledge regarding poroscopy.

Course Contents:

Module I: Comprehensive Document Examination
Threatening letters, micro bacterial examination of the document, secret messages by terrorist. Conditions of folds, adhesive on the envelop and decipherment of postal stamp.

Module II: Genuine signature obtained by trickery on blank paper
Genuine signature with forged contents above it, doubtful spacing pattern, uneven margins and differences of age of ink

Module III: Electronic Document
Compact discs, pen drive, mobile messages, and MMS, voice print medium (paperless document), etc.

Module IV: Stamps, Fake currency and Holograms
Examination of fake printed stamps, currency notes and watermarks, fake visa's, passports and security documents under transmitted light, UV and IR light, preservation of historical documents.

Module V: Fraud in Historical Documents
Identification of fraudulent letters, diaries, and signatures of celebrities and fraudulent historical paintings and Manuscripts. Examination of binding material, gum, and inks

Module VI: Erasures and Alterations
Fraudulent additions, alterations, obliterations and erased writings on valuable deeds and cheques. Study of real court cases of forged documents solved by the practicing questioned document experts.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Albert, S. Osborn, Questioned Documents, Second Ed., Universal Law Publishing, Delhi, 1998.
- Albert, S. Osborn, The Problem of Proof, Second Ed., Universal Law Publishing, Delhi, 1998.
- Charles, C. Thomas, I.S.Q.D. Identification System for Questioned Documents, Billy Prior Bates, Springfield, Illinois, USA, 1971.
- Charles C. Thomas, Typewriting Identification I.S.Q.D.; Billy Prior Bates; Springfield, Illinois, USA, 1971.
- Hard less, H.R., Disputed Documents, handwriting and thumbs – print identification: profusely illustrated, Low Book Co., Allahabad, 1988.
- Kurtz, Sheila, Grapholypes a new plant on handwriting analysis, Crown Publishers Inc., USA, 1983.
- Lerinson, Jay, Questioned Documents, Acad Press, London, 2001.
- Morris, Ron, N., Forensic handwriting identification, Acad Press, London, 2001.
- Ordway Hilton, Scientific Examination of Questioned Documents, Rev. ED., Elsevier, New York, 1982.
- Wilson, R., Harrison, Suspect Documents – Their Scientific Examination; Universal Law Publishing, Delhi, 1997.

ADVANCED QUESTIONED DOCUMENTS EXAMINATION – IV

Course Code: MFS 408 **Credit Units: 05**

Course Objective:

On completion of this course, the students would be able to know about the Computer Generated writings & forged Xerox copies and different types of questioned documents, the equipments used in analyzing Questioned Documents, examination of handwriting, typewriting and identification of signatures. The students will be able to solve the exceptional and difficult problems regarding disputed documents where other hidden aspects are essential to be proved.

Course Contents:

Module I: Mechanically Reproduced, Computer Generated & security Documents
Examination of different types of Xerox copies, carbon, fax copies, Examination of fake currency notes, passports, visa, stamp paper, security documents, forged documents made by computers, watermarks. Photography and court methods

Module II: Age of Ink & paper
Age of ink, examination of computer printer ink, dot matrix, inkjet and laser prints. Wet chemistry methods, photography and report writing. Age of paper, effect of preservation and storage of documents, absorption pattern of ink,

Module III: Type Written Documents & Other Relevant Examination
Identification of type machine, comparison of type written matter with the help of wear and tear (individual characteristics), Examination of staple holes, folds and stains on paper, tearing, adhesive, date, and other suspicious markings.

Module IV: Assisted or Guided Signatures & Typography
Identification of the assisting party, close friend or family member and the conflicting characteristics by primary writer and assisting party Types, Type classification system, measuring font size and line spacing, factors affecting line spacing.

Module V: Initials, Numerals and Dates
Short initials, full signatures, and different pictorial appearances, search for authentic initials for comparison, problems of small writings, Fundamental differences of numerals of different writers, different class and individual characteristics, geographical and cultural influences

Module VI: Different writing conditions and their effect & Psychological Aspects of Handwriting
Effect of alcohol, and drugs on the handwritings, additional causes of variation in handwritings: probing the drinking habits of the writer. Obtaining specimen in similar conditions. Effect of fear, haste, excitement, depression on the handwriting and obtaining the specimen for suitable comparison. Study of psychological aspects in suicidal notes.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Albert, S. Osborn, Questioned Documents, Second Ed., Universal Law Publishing, Delhi, 1998.
- Albert, S. Osborn, The Problem of Proof, Second Ed., Universal Law Publishing, Delhi, 1998.
- Charles, C. Thomas, I.S.Q.D. Identification System for Questioned Documents, Billy Prior Bates, Springfield, Illinois, USA, 1971.
- Charles C. Thomas, Typewriting Identification I.S.Q.D.; Billy Prior Bates; Springfield, Illinois, USA, 1971.
- Hard less, H.R., Disputed Documents, handwriting and thumbs – print identification: profusely illustrated, Low Book Co., Allahabad, 1988.
- Kurtz, Sheila, Grapholypes a new plant on handwriting analysis, Crown Publishers Inc., USA, 1983.
- Lerinson, Jay, Questioned Documents, Acad Press, London, 2001.
- Morris, Ron, N., Forensic handwriting identification, Acad Press, London, 2001.
- Ordway Hilton, Scientific Examination of Questioned Documents, Rev. ED., Elsevier, New York, 1982.
- Wilson, R., Harrison, Suspect Documents – Their Scientific Examination; Universal Law Publishing, Delhi, 1997.

ADVANCED FINGERPRINT DEVELOPMENT AND FINGERPRINT EVIDENCE IN COURT OF LAW AND ADVANCEMENT IN FORENSIC DACTYLOSCOPY

Course Code: MFS 409 **Credit Units: 05**

Course Objective:

On completion of this course, the students would acquire knowledge regarding fingerprint patterns, the different types of fingerprint classification, the various methods of fingerprint development and their recording. The students will learn about the various latest techniques of developing fingerprints and presentation of the evidence in the court

Course Contents:

Module I: Fingerprints in personal Identification & in scene of crime
Importance of fingerprints in personal identification, pattern types, pattern areas, recording of prints-inked impression. Various types of fingerprints encountered at the scene of crime like blood stained prints, forged, blurred and superimposed thumb impressions on legal documents

Module II: Advanced Methods of Recording Fingerprints & Digitalization of Fingerprints
Digital transmission, comparison of fingerprints, basis of comparison, class characteristics, individual characteristics, various types of ridge characteristics, Automatic fingerprint identification system. Digital imaging and enhancement, application of laser and other radiations to develop latent fingerprints, metal deposition method and development of latent prints on skin.

Module III: Poroscopy & Comparison of control and Suspect Finger prints
Poroscopy, forgery of fingerprints, Finger print expert in court, Fingerprints and Paternity, Fingerprint problems, fingerprints of dead and living persons, Comparison of the suspect with the control, report writing and presentation of evidence in court.

Module IV: Missing and damaged Finger & Scarred Patterns
Deformed finger, difficulty in ridge counting and tracing, deformity and different patterns Definition, exceptional patterns, difficulties in classification, searching of size, sequence and trend of ridges

Module V: Preparation of Photo charts, Fingerprint Evidence & Opinion in Court
Degree of enlargement, counting and tracing of ridges, selection of suitable corresponding areas and clarity with reasoning in opinion Opinion on ridge characteristics, number of ridge characteristics, view of supreme court of India and F.B.I

Module VI: Advanced Development techniques & Collection and Preservation of Fingerprint Evidence
Different kinds of latest techniques. The methods of collection & preservation of fingerprints from the Crime Scene.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Bridges, B. C., Vollmar, A. Monir, M., Criminal Investigation, Practical Fingerprinting, Thumb Impression, Handwriting, Expert Testimony Opinion Evidence, The University Book Agency, Allahbad, 2000.
- James, S. H. and Nordby, J. J. (Eds), Forensic Science - An Introduction to Scientific and Investigation Techniques, CRC Press, London, 2003.
- Nanda, B. B., and Tewari, R. K., Forensic Science in India. Select Publishers, New Delhi, 2001.
- Saferstein, Richard, Criminalistics, An Introduction to Forensic Science, 6th Ed. Prentice-Hall, New Jersey, 1998.
- Sharma, B. R., Forensic Science in Criminal Investigation and Trials (3rd Edn) Universal Law Publishing Co. Ltd. New Delhi, 2001.

PRACTICALS – II: QUESTIONED DOCUMENTS AND FINGERPRINTS

Course Code: MFS 422 **Credit Units: 04**

Course Objective:

The course is designed to expose students to the practical aspects of forensic biology, anthropology, serology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of biological, anthropological, & serological evidences. The students will be able to collect, pack and analyse biological, anthropological, & serological evidences. They will know how to document chain of custody, write laboratory reports pertaining to the examinations conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

1. Comprehensive document examination i.e. folds, crease, stains, seal.
2. Examination of charred documents
3. Age of ink and paper
4. Examination and comparison of computer generated documents, security documents, fake currency and stamp papers.
5. Development of latent finger prints and photography
6. Comparison of fingerprints, palmprints and report writing
7. Moot court in fingerprint and questioned document cases.

Examination Scheme:

Practical Exam:	35
Attendance:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**

ADVANCED FORENSIC BALLISTICS

Course Code: MFS 410 **Credit Units: 05**

Course Objective:

On the completion of the course the student will know about the latest trends in forensic ballistics, safety and operating testing, Identification, evaluation of arms & ammunition. They will also learn report writing and presentation of firearm related evidence in court of law

Course Contents:

Module I: Instruments in Forensic Ballistics
Use of stereomicroscopy, comparison microscope – mechanical stages, lightning arrangements and photographic arrangements, Safety and Operating Testing

Module II: Evaluation Techniques in Forensic Ballistics
Side by side match, composite match, superimposition, periphery camera, striagraphy, cast, and macro-photography, Factors Affecting Effective Range of Firearm, Firearm database and Automated Search System

Module III: Arms and Ammunition Linkage (Cartridge Case)
Principles and practice of identification of firearms, different types of marks produced (class and individual characteristics) during firing process on cartridge case -firing pin marks, breech face marks, chamber marks, extractor and ejector marks, Restoration of Erased Serial Numbers and Proof marks

Module IV: Arms and Ammunition Linkage (Bullet)
Different types of marks produced during firing process on bullet-number/direction of lands and grooves, width of lands and depth of grooves, angle and pitch of rifling, striation marks on lands and grooves, identification of various parts of firearms, techniques for obtaining test material from various types of weapons and their linkage with fired ammunition, class and individual characteristics

Module V: Analysis of Gunshot Residues
Mechanism of formation of GSR, source and collection, spot test, chemical test, identification of shooter and instrumental methods of GSR Analysis

Module VI: Examination Procedures
Location, collection, preservation and dispatch of firearm related evidences, test firing, safety aspects during the test firing, particle contamination, barrel wash examination, Examination of Firearm or parts thereof/ manufacturing tool, Examination of functioning of firearms prone to accidental discharge, restoration of erased serial numbers, identification of ammunition, type make and caliber, identification of bullets, shots and pellets, chemical tests, Case Laws, report writing and presentation in court of Law

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Brain J. Heard; Hand book of Firearms and Ballistics; John Willey, England, 1997.
- Gary J. Ordog, Management of Gunshot Wounds; Elsevier, New York, 1983.
- Hatcher, Jury and Weller; Firearms Investigation, Identification and Evidence; Stackpole Books, Harrisburg, PA, 1977.
- I.V. Hogg; The Cartridges Guide – A small arms Ammunition Identification Mannual; The Stackpole Co., Harrisburg, PA., 1982.
- J. Howard Mathews; Charles C. Thomas, Firearms Identification, Vols, 1, 2 & 3; Springfield, Illinois, 1973.
- Karl G. Sellier et al; Wound Ballistics and The Scientific Background; Elsevier, London, 1994.
- M. Johari, Identification of Firearm, Ammunition and Firearms Injuries; BPR&D, New Delhi 1980.
- TA. Warlow; Firearms, The Law and Forensic Ballistics; Taylor and Francis, London, 1996.
- Vincent Di Maio, Gunshot Wounds; CRC Press, Washington, DC; 1999.
- D.A. Skoog, D.M. West and F.J. Holler; Analytical Chemistry: An Introduction; Saunders College Publishing, Philadephia, USA, (1994)
- Dettean, J D; Kirk's Fire Investigation, 5th ed, Prentice Hall, Eaglewood Cliffs, N.J (2002)
- Working Procedure Manual: Chemistry, Explosives and Narcotics, BPR&D Pub (2000)
- Y. Lyalikov; Physiochemical Analysis; Mir, Moscow, USSR, (1968)
- Yinon Jitrin; The analysis of Explosives; Berbaman press, New York (1981)

WOUND BALLISTICS AND EVALUATION OF FIREARM INJURIES

Course Code: MFS 411 **Credit Units: 05**

Course Objective:

On the completion of this course, the students will be able to understand and evaluate the type of injuries caused as result of different types of firearms, principles and practice of identification of firearms, ammunition and their components and also determination of the range of firing, methods of laboratory examination of fired cartridges and fire arms. The students will also learn to reconstruct the sequence of events in cases involving firearms

Course Contents:

Module I: Determination of range of firing
Ejecta, burning, scorching, blackening, tattooing and metal fouling, shots dispersion and GSR distribution, time of firing – different methods employed, and their limitations, stereo & comparison microscopy, automatic bullet and cartridge comparison system

Module II: Wound Ballistics-I
Threshold velocity for penetration of skin/flesh/bones, preparation of gel block penetration of projectiles in gel block and other targets, nature of wounds of entry, exit, initial track with various ranges and velocities with various types of projectiles, explosive effects.

Module III: Wound Ballistics-II
Evaluation of injuries caused due to shot-gun, rifle, handguns and country made firearms, methods of measurements of wound ballistics parameters, post-mortem and anti-mortem firearm injuries.

Module IV: Ricochet
Definition, intermediate target, factors affecting the ricochet phenomena, ricochet from different surfaces, ricochet and critical angle.

Module V: Accidental Discharge
Accidental discharge, causes of accidental discharge and their evaluation.

Module VI: Medico-legal aspects of firearm injuries
Determination of range, time and direction of firing, evaluation of the suicidal, homicidal and accidental firearm injuries, reconstruction of a shooting incidence.

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- Brain J. Heard; Hand book of Firearms and Ballistics; John Willey, England, 1997.
- Gary J. Ordog, Management of Gunshot Wounds; Elsevier, New York, 1983.
- Hatcher, Jury and Weller; Firearms Investigation, Identification and Evidence; Stackpole Books, Harrisburg, PA, 1977.
- I.V. Hogg; The Cartridges Guide – A small arms Ammunition Identification Mannual; The Stackpole Co., Harrisburg, PA., 1982.
- J. Howard Mathews; Charles C. Thomas, Firearms Identification, Vols, 1, 2 & 3; Springfield, Illinois, 1973.
- Karl G. Sellier et al; Wound Ballistics and The Scientific Background; Elsevier, London, 1994.
- M. Johari, Identification of Firearm, Ammunition and Firearms Injuries; BPR&D, New Delhi 1980.
- TA. Warlow; Firearms, The Law and Forensic Ballistics; Taylor and Francis, London, 1996.
- Vincent Di Maio, Gunshot Wounds; CRC Press, Washington, DC; 1999.

KINETICS, MANUFACTURING AND ANALYSIS OF EXPLOSIVES

Course Code: MFS 412 **Credit Units: 05**

Course Objective:

On the completion of the course the student will be able to learn the kinetics and thermochemistry of explosives. They also gain knowledge of the explosion effects and manufacturing of different explosives. They will also gain knowledge about the analysis of various explosives residues.

Course Contents:

Module I: Initiation Techniques & Effects of Explosions
Explosive train, detonators, igniters, thermal decomposition, combustion, deflagration, detonation, factors affecting detonation, Blast pressure, Fragmentation effects and Thermal effects.

Module II: Kinetics& Measurement of Explosive Reactions
Kinetics, activation energy, rate of reaction, kinetics of thermal decomposition, Differential thermal analysis, thermogravimetric analysis, differential scanning calorimetry.

Module III: Manufacturing of Primary & secondary Explosives
Nitration: C- nitration, O-nitration, N-nitration. Manufacturing of primary explosives: lead azide, mercury fulminate, tetrazene, Ammonium nitrate, dynamite, casting, pressing, Ram and screw extrusion

Module IV: Location, Collection of explosive residue
Location and collection of fireworks, military explosives,, home made bombs, booby traps and letter bombs. Disposal of an explosive device, dispatch of explosive device and exploded material

Module V: Detection of Hidden Explosives
Vapor detection method: trained animals, adsorption and preconcentration of explosive vapors, ion mobility spectrometery, bioluminescence. X-ray imaging, energetic photons detection, thermal neutron activation, fast neutron technique.

Module VI: Explosion Scene Investigation
Specific approach to scene of explosion, post-blast residue collection, Reconstruction of sequence of events, Evaluation and assessment of scene of explosion, systematic examination of explosives and explosion residues in the laboratory

Examination Scheme:

Components	H	A	CT	EE1
Weightage (%)	10	5	15	70

Text & References:

- D.A. Skoog, D.M. West and F.J. Holler; Analytical Chemistry: An Introduction; Saunders College Publishing, Philadephia, USA, (1994)
- Dettean, J D; Kirk's Fire Investigation, 5th ed, Prentice Hall, Eaglewood Cliffs, N.J (2002)
- Working Procedure Manual: Chemistry, Explosives and Narcotics, BPR&D Pub (2000)
- Y. Lyalikov; Physiochemical Analysis; Mir, Moscow, USSR, (1968)
- Yinon Jitrin; The analysis of Explosives; Berbaman press, New York (1981)

PRACTICALS – II: FORENSIC BALLISTICS AND EXPLOSIVES

Course Code: MFS 423 **Credit Units: 04**

Course Objective:

The course is designed to expose students to the practical aspects of forensic biology, anthropology, serology. At the end of the course students will have acquired practical experience with and comprehensive knowledge of techniques presently being used in the forensic examination of biological, anthropological, & serological evidences. The students will be able to collect, pack and analyse biological, anthropological, & serological evidences. They will know how to document chain of custody, write laboratory reports pertaining to the examinations conduct presumptive and confirmatory tests for evidence and will be confident to present test results as an expert witness during his/her job in a laboratory or as an expert.

Course Contents:

1. GSR collection and analysis of various components of GSR
2. Linkage of suspected cartridge case with the firearm on the basis of class and individual characteristics.
3. Linkage of suspected bullet with the firearm on the basis of class and individual characteristics.
4. Collection of case laws related to Forensic Ballistics.
5. Study of reasons of acquittals of firearm cases & remedies.
6. Application of basic methods of detection of explosives.

Examination Scheme:

Practical Exam:	35
Attendance:	10
Record File:	10
Conduction & Writing of Practical	20
Viva	25
Total	**100**