MAHATMA GANDHI UNIVERSITY

Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2024 Admission Onwards

SYLLABUS						
SIGNATURE COURSE						
Name of the College	Bishop Abraham Memorial College, Thuruthicaud					
Faculty/ Discipline	Chemistry					
Programme	BSc (Hons) Chemistry					
Course Coordinator	Dr Sini Jacob					
Contributors	Dr. Rani R Nair					
Course Name	FUNDAMENTALS OF FORENSIC SCIENCE					
Type of Course	DSE					
Specialization title	Forensic Chemistry					
Course Code	To be prepared by the University					
Course Level	200					
Course Summary	This course covers the fundamental concepts of Forensic Science, its organizational structure at national & international level, various acts pertaining to crime, criminal laws, criminal justice systems & forensic psychology & psychiatry to study the minds of crime & criminal.					
Semester	3	**Credits**			4	**Total Hours**
Course Details	**Learning Approach**	Lecture	Tutorial	Practical	Others	
		4	0	0	0	60
Pre-requisites, if any						

Course Outcomes (CO)

Number of COs		**7**	
CO No.	**Expected Course Outcome**	**Learning Domains ***	**PO No**
1	Apply the laws & basic principles of Forensic science to crime scene	A	PO3
2	To understand the organizational structure of forensic laboratories	U	PO3
3	To relate fundamental rights & duties to criminal law	AN	PO3
4	To know about forensically relevant Acts implemented	K	PO3
5	To understand criminology & victimology & human rights	E	PO3
6	To evaluate psychological disorders	S	PO3
7	To understand post-trauma & post-partum stress disorders	S	PO3

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	-	-	1	-	-	-	-	-	-	-
CO 2	-	-	2	-	-	-	-	-	-	-
CO 3	-	-	1	-	-	-	-	-	-	-
CO 4	-	-	2	-	-	-	-	-	-	-
CO 5	-	-	2	-	-	-	-	-	-	-
CO 6	-	-	1	-	-	-	-	-	-	-
CO 7	-	-	1	-	-	-	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Introduction to Forensic Science			
	1.1	Definition and Scope of Forensic Science, History and Development of Forensic Science, Laws and Basic principles of Forensic Science. Branches of Forensic science	5	["1"]
	1.2	Organizational structure & services of state and central Forensic Science Laboratories in India (FSL, CFSL etc.). Services provided by other institutions (GEQD, FPB etc.). Mobile FSL- Role & Functioning. The Forensic scientist: Education, training and code of conduct of forensic scientists.	6	["2"]
	1.3	Forensic science in international perspectives, including set up of INTERPOL, RAW, CBI, and FBI.	4	["4"]
2	Criminal law and Indian Constitution			
	2.1	Essential elements of criminal law. Constitution and hierarchy of criminal courts. Classification – civil, criminal cases. Criminal Procedure Code. Cognizable and non-cognizable offences. Bail able and non-bail able offences.	4	["3"]
	2.2	Comparison of new criminal laws with IPC CrPC and IEA. Basic provisions related to FIR, Procedure for investigation, Arrest, Summons and warrant.	4	["3"]
	2.3	Indian Constitution: Preamble, Fundamental Rights, Directive Principles of State Policy, Fundamental duties.	2	["4"]
	2.4	Minor Acts and Special laws: Forensically relevant sections of NDPS Act 1985, Information Technology Act 2000, The Protection of Children from Sexual Offences Act (POCSOAct) 2012, Juvenile Justice (Care and Protection of Children) Act, 2015. Prevention of Domestic Violence Act 2005, Dowry Prohibition Act 1961.	5	["4"]
3	Crime and Criminal Justice System			
	3.1	Crime: Definition, Types of Crime, Causes of Crime, Schools of Criminology, Theories of Criminology, Theories of Punishment, Probation & Parole, Correctional Institutions	5	["5"]
	3.2	Victimology: Types of Victims, post-crime effects on the victim, relief and compensatory aids, therapies.	4	["5"]
	3.3	Criminal Justice System in India: Structure and functional process. Courts: type, hierarchy and function. Role of police in criminal investigation and accountability to law, people and society. Custodial death, Police and Human Rights.	6	["5"]

Module	Units	Course Description	Hrs	CO No.
4	Forensic Psychology and Psychiatry			
	4.1	Forensic Psychology: Introduction, Functions and Role of Forensic Psychologist. Tests used in Forensic Psychology Assessment.	5	["6"]
	4.2	Psychometric Tools used in Forensic Psychology, Psychological autopsy, Forensic Behavioural Analysis, Serial Killers, Modus operandi, Portrait Parle.	5	["6"]
	4.3	Forensic Psychiatry: Introduction to different mental illness, Impulsive control stress disorder, Psychopathy and Sociopathy, post-traumatic stress disorder and post-partum stress disorder	5	["7"]

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** Classroom procedure (mode of transaction) ● Lecture (chalk & board, PowerPoint presentation) ● Group discussion ● Peer teaching

Assessment Types	**MODE OF ASSESSMENT** Mode of Assessment: Theory **A. Continuous Comprehensive Assessment (CCA)** **• Theory – 30 Marks** Assignments / MCQ / Class test / Viva **B. End Semester Evaluation (ESE)** **• Theory – 70 Marks** Assessment Methods – Written exam Duration of Examination – 2.00 Hrs Pattern of examination for Theory – Non-MCQ Different parts of written examination – Part - A , B , C Answer Type: ◦ PART - A ◦ Short answer - (5 out of 7) – 5 × 4 = 20 ◦ PART - B ◦ Short Essays - (5 out of 7) – 5 × 7 = 35 ◦ PART - C ◦ Essays - (1 out of 2) – 1 × 15 = 15

References

- B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi (2001).
- M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002).
- S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
- W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997).
- R. Saferstein, Criminalistics, 8th Edition, Prentice Hall, New Jersey (2004).

Affidavit

- We, Bishop Abraham Memorial College, Thuruthicaud and Dr Sini Jacob, retain the copyright of this syllabus and expressly prohibit its distribution in complete form to any institution outside our own.
- We, Bishop Abraham Memorial College, Thuruthicaud, agree to appoint a new course coordinator for the proposed

Forensic Chemistry in the event of the unavailability of the currently nominated coordinator. This appointment will ensure the continued coordination of course delivery, assessments, and all related academic responsibilities necessary for the successful implementation of the specialization, for as long as the college offers this programme.

- We, Bishop Abraham Memorial College, Thuruthicaud and Dr Sini Jacob, declare that no part of this signature course submitted here for approval has been taken from the course content developed by, or from any of the course titles prepared by, the BoS/expert committee in the same discipline under our University.

MAHATMA GANDHI UNIVERSITY
Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2024 Admission Onwards

SYLLABUS						
SIGNATURE COURSE						
Name of the College	Bishop Abraham Memorial College, Thuruthicaud					
Faculty/ Discipline	Chemistry					
Programme	BSc (Hons) Chemistry					
Course Coordinator	Dr Sini Jacob					
Contributors	Dr. Rani R Nair					
Course Name	CRIME SCENE INVESTIGATION, MANAGEMENT AND RECONSTRUCTION					
Type of Course	DSE					
Specialization title	Forensic Chemistry					
Course Code	To be prepared by the University					
Course Level	200					
Course Summary	This course covers various aspects of a crime scene. This course deals with the collecting & analysing of evidences from crime scene. It also deals with how to manage and reconstruct a crime scene.					
Semester	4	**Credits**			4	**Total Hours**
Course Details	**Learning Approach**	Lecture	Tutorial	Practical	Others	
		4	0	0	0	60
Pre-requisites, if any						

Course Outcomes (CO)

Number of COs		**5**	
CO No.	**Expected Course Outcome**	**Learning Domains ***	**PO No**
1	To learn about analyzing various evidence in crime scene	E	PO1
2	To know more about various crime scenes & to analyze them	U	PO2
3	To learn to document various crime scenes using different techniques	S	PO1
4	To know various components of crime scene management	K	PO1, PO2
5	To learn how to reconstruct various crime scene using various techniques	C	PO1

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	-	-	-	-	-	-	-	-	-

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 2	-	1	-	-	-	-	-	-	-	-
CO 3	1	-	-	-	-	-	-	-	-	-
CO 4	1	2	-	-	-	-	-	-	-	-
CO 5	2	-	-	-	-	-	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Evidences			
	1.1	Definition, types (testimonial and real evidence) (oral & circumstantial), understanding the nature of physical evidences. Forensic significance of physical evidences. Class and Individualization. Known and questioned items, Relationship and context.	5	["1"]
	1.2	Collection, preservation, packing and forwarding of different types of evidences (Fingerprint, hair, fibre, glass, soil, Questioned documents, impression evidences, etc.) to the FSL. Comparison of evidence and controls, Analysis of evidence and Controls, Admissibility of scientific evidence, Frye case and Daubert standard.	6	["1"]
	1.3	Ethics in forensic science.	4	["4"]
2	Crime scene investigation			
	2.1	Introduction, Types of Crime Scenes (Indoor, Outdoor, Mobile, Water). Various Crime Scenes (Homicide, Suicide, Accidental, Theft etc.). Crime scene protection and processing methodology- assessing, observing, documenting, searching, collecting, analyzing.	7	["2"]
	2.2	Crime Scene Documentation (Sketching, Photography, Videography and Notes-taking). Digital imaging of crime scene and 3D scanning techniques. Various Crime Scene Search methods. Locating, Prioritize, Collection of probative value evidences and maintenance of chain of custody. Safety, Universal precautions for handling hazardous materials, personal protective equipment.	8	["3"]
3	Components of Crime Scene Management			
	3.1	Role of various experts at crime scene. Security, safety and preservation of crime scene. Contamination control. Scene Survey and initial documentation.	5	["4"]
	3.2	Co-ordination amongst various agencies involved in investigation. Co-ordination of Interstate investigation agencies. Case studies and report writing of crime scene visits.	4	["4"]
	3.3	Advances in crime scene management: Tele forensic technology for crime scene investigation. Mobile kits and equipment, their utility on crime scene. Technology innovation in crime scene management	6	["4"]
4	Crime Scene Reconstruction			
	4.1	Steps involved (Recognition of evidence, Documentation of evidence, Collection of evidence, Evaluation of evidence, Hypothesis, Testing, Reconstruction), various crime scenes and scenarios (like Hit and Run, Accidents, Hanging, Shooting, Burglary, etc.).	8	["5"]
	4.2	Role of Logic in CSR. Writing a reconstruction report. Correlation of crime scene analysis with behavioural analysis. Digital Aids in Reconstruction (3-D Photography/Videography, Computer aided Reconstruction)	7	["5"]

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** • Lecture-based approach, • Interactive discussions, • Laboratory sessions, • Flipped classroom, • Peer teaching • Collaborative learning.

Assessment Types	**MODE OF ASSESSMENT** Mode of Assessment: Theory **A. Continuous Comprehensive Assessment (CCA)** **• Theory – 30 Marks** Assignments / MCQ / Class test / Viva **B. End Semester Evaluation (ESE)** **• Theory – 70 Marks** Assessment Methods – Written exam Duration of Examination – 2.00 Hrs Pattern of examination for Theory – Non-MCQ Different parts of written examination – Part - A , B , C Answer Type: ◦ PART - A ◦ Short answer - (5 out of 7) – 5 × 4 = 20 ◦ PART - B ◦ Short Essays - (5 out of 7) – 5 × 7 = 35 ◦ PART - C ◦ Essays - (1 out of 2) – 1 × 15 = 15

References

- Houck, M.M & Siegel, J.A; Fundamentals of Forensic Science, Acadamic Press, London, 2006.
- Sharma, B.R; Forensic Science in Criminal Investigation & Trials, Universal Publishing Co., New Delhi, 2003
- James, S.H and Nordby, J.J; Forensic Science- An Introduction to Scientific and Investigative Techniques, CRC Press, USA, 2003.
- Saferstein; Criminalistics- An Introduction of Forensic Science, Prentice Hall Inc, USA,2007.
- Barry, A.J. Fisher; Techniques of Crime Scene Investigation, 7th Ed, CRC Press, NewYork, 2003.
- Lyman, M.D; Criminal Investigation – The Art & the Science, Prentice Hall, New Jersey, 2002.
- O'Hara CE & Osterburg, JW; An Introduction to Criminalistics., Indiana University. Press, London, 1972.
- Ross M Gardner, Practical Crime Scene Analysis and Reconstruction (practical aspects of criminal and forensic investigation 2009.

Affidavit

- We, Bishop Abraham Memorial College, Thuruthicaud and Dr Sini Jacob, retain the copyright of this syllabus and expressly prohibit its distribution in complete form to any institution outside our own.
- We, Bishop Abraham Memorial College, Thuruthicaud, agree to appoint a new course coordinator for the proposed Forensic Chemistry in the event of the unavailability of the currently nominated coordinator. This appointment will ensure the continued coordination of course delivery, assessments, and all related academic responsibilities necessary for the successful implementation of the specialization, for as long as the college offers this programme.
- We, Bishop Abraham Memorial College, Thuruthicaud and Dr Sini Jacob, declare that no part of this signature course submitted here for approval has been taken from the course content developed by, or from any of the course titles prepared by, the BoS/expert committee in the same discipline under our University.

MAHATMA GANDHI UNIVERSITY

Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2024 Admission Onwards

SYLLABUS						
SIGNATURE COURSE						
Name of the College	Bishop Abraham Memorial College, Thuruthicaud					
Faculty/ Discipline	Chemistry					
Programme	BSc (Hons) Chemistry					
Course Coordinator	Dr Sini Jacob					
Contributors	Dr. Rani R Nair					
Course Name	FORENSIC CHEMISTRY					
Type of Course	DSE					
Specialization title	Forensic Chemistry					
Course Code	To be prepared by the University					
Course Level	300					
Course Summary	This course covers the significance of chemistry in Forensic Sciences. It deals with the chemistry behind arson, explosives, drugs, dyes, polymers, inks which can be used to analyze & detect crime.					
Semester	5	**Credits**			4	**Total Hours**
Course Details	**Learning Approach**	Lecture	Tutorial	Practical	Others	
		4	0	0	0	60
Pre-requisites, if any						

Course Outcomes (CO)

Number of COs		**4**	
CO No.	**Expected Course Outcome**	**Learning Domains ***	**PO No**
1	To learn to analyse the debris & residue of arson fire & explosions	AN	PO1, PO2
2	To understand the forensic examination of drug & alcohol abuse	U	PO1
3	To learn to extract & analyze poison from human samples	S	PO1, PO2
4	To know how to utilize ink, dye & polymer in forensics	K	PO1

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	2	-	-	-	-	-	-	-	-
CO 2	2	-	-	-	-	-	-	-	-	-

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 3	2	1	-	-	-	-	-	-	-	-
CO 4	1	-	-	-	-	-	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Arson and Explosives			
	1.1	Introduction to Arson, Types of Fires, and Causes of fire, Patterns of fire. Liquid and solid incendiaries, Analysis of Fire Debris, Petroleum products.	7	["1"]
	1.2	Classification and chemistry of explosives. Various types of IEDs and their reconstruction. Mechanism of explosion and their effects. Examination of explosive and explosion residues.	8	["1"]
2	Narcotic Drug and Psychotropic substances			
	2.1	Introduction to Controlled drugs and Substances, Classification of controlled substances. Narcotic Drugs and psychotropic substances as under NDPS Act. Commonly abused drugs, Designer Drugs. Drugs of abuse in sports, Date rape drugs and their forensic examination, Drug dependence and Drug Tolerance.	8	["2"]
	2.2	Alcoholic and Non-alcoholic beverages: country made liquor, illicit liquor and medicinal preparations containing alcohol and drugs as constituents. Forensic significance of non-alcoholic beverages.	7	["2"]
3	Toxicology			
	3.1	Classification of poisons. Mode of action, signs and symptoms of different types of poisons. Fatal dose, fatal period, Symptoms, some common Antidotes Post-mortem findings, Collection and preservation of viscera and other samples. Isolation and Different methods of extraction of poisons from viscera	8	["3"]
	3.2	Extraction of poisons from blood, urine, stomach washes and vomits, food material and toxicological analysis of decomposed materials. Interpretation of toxicological finding and preparation of reports, limitation of method and trouble shooting in toxicological analysis, disposal of analysis samples.	7	["3"]
4	Dyes, Inks & Polymers in Forensics			
	4.1	Bribe Trap Cases: Examination of Chemicals used in bribe trap cases. Inks: Forensic Examination of inks by various techniques, Dating and aging of inks.	6	["4"]
	4.2	Polymers: Forensic examination of plastics and adhesives. Introduction to classification and forensic analysis of dyes.	6	["4"]
	4.3	Forensic importance of environmental toxicology.	3	["4"]

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** • Lecture (chalk & board, PowerPoint presentation, flipped classroom) • Group Discussion • Peer interaction

Assessment Types	**MODE OF ASSESSMENT** Mode of Assessment: Theory **A. Continuous Comprehensive Assessment (CCA)** **• Theory – 30 Marks** Quiz /Assignment / Open book written exam **B. End Semester Evaluation (ESE)** **• Theory – 70 Marks** Assessment Methods – Written exam Duration of Examination – 2.00 Hrs Pattern of examination for Theory – Non-MCQ Different parts of written examination – Part - A , B , C , D Answer Type: ◦ PART - A ◦ MCQ - (11 out of 11) – 11 × 1 = 11 ◦ PART - B ◦ Short answer - (8 out of 10) – 8 × 3 = 24 ◦ PART - C ◦ Short Essays - (3 out of 5) – 3 × 5 = 15 ◦ PART - D ◦ Essays - (2 out of 3) – 2 × 10 = 20

References

- Curry: Analytical Methods in Human Toxicology, Part II, 1986.
- Curtis Klaassen, Casarett & Doll Toxicology: The Basic Science of poisons, 8th Edtion, Mc Graw Hill,2013
- Moffat, A.C.: Osselton, D. M. Widdop, B.: Clarke's Analysis of Drugs and Poisons in Pharmaceuticals, body fluids and postmortem material, 3rd ed., Pharmaceutical Press,2004.
- Holfmann, F.G.: Handbook of Drug and Alcohol Abuse.
- Reject Paul. M.P, Forensic Toxicology, SSBT, New Delhi, 2009
- Sunshine, I: Guidelines for Analytical Toxicology Programme, Vol-I, CRC press, 1950.
- Sunshine, I: Handbook of Analytical Toxicology, press, 1969.
- Connors, K.: A text book of Pharmaceuticals analysis, Interscience, New York, 1975.
- Niesink, RJM; Toxicology- Principles and Applications, CRC Press, 1996.

Affidavit

- We, Bishop Abraham Memorial College, Thuruthicaud and Dr Sini Jacob, retain the copyright of this syllabus and expressly prohibit its distribution in complete form to any institution outside our own.
- We, Bishop Abraham Memorial College, Thuruthicaud, agree to appoint a new course coordinator for the proposed Forensic Chemistry in the event of the unavailability of the currently nominated coordinator. This appointment will ensure the continued coordination of course delivery, assessments, and all related academic responsibilities necessary for the successful implementation of the specialization, for as long as the college offers this programme.
- We, Bishop Abraham Memorial College, Thuruthicaud and Dr Sini Jacob, declare that no part of this signature course submitted here for approval has been taken from the course content developed by, or from any of the course titles prepared by, the BoS/expert committee in the same discipline under our University.

MAHATMA GANDHI UNIVERSITY

Kottayam, Kerala

Undergraduate Programmes (HONOURS)
2024 Admission Onwards

SYLLABUS						
SIGNATURE COURSE						
Name of the College	Bishop Abraham Memorial College, Thuruthicaud					
Faculty/ Discipline	Chemistry					
Programme	BSc (Hons) Chemistry					
Course Coordinator	Dr Sini Jacob					
Contributors	Dr. Rani R Nair					
Course Name	ADVANCED FORENSIC CHEMISTRY					
Type of Course	DSE					
Specialization title	Forensic Chemistry					
Course Code	To be prepared by the University					
Course Level	300					
Course Summary	This course covers the advanced areas of forensic chemistry. The student learns about DNA profiling & finger printing from sample collected from crime scene. The student becomes aware of the poisons through different type of chemicals & how to handle them. The course also updates the significance of artificial intelligence and digital software in forensics. Practical part of the course deals with various techniques to analyze samples taken from crime scene.					
Semester	6	**Credits**			4	**Total Hours**
Course Details	**Learning Approach**	Lecture	Tutorial	Practical	Others	
		3	0	1	0	75
Pre-requisites, if any						

Course Outcomes (CO)

Number of COs		**5**	
CO No.	**Expected Course Outcome**	**Learning Domains ***	**PO No**
1	To learn to extract & study DNA profiling	AN	PO1, PO2
2	To understand the principles of Finger printing & its significance	U	PO1, PO2
3	To learn to extract & analyze poison from human samples	S	PO1, PO2
4	To learn the significance of digital software & AI in forensics	K	PO1, PO2
5	Make use of theory to analyze & investigate a crime scene	A	PO1, PO2

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)*

CO-PO Articulation Matrix

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	1	-	-	-	-	-	-	-	-
CO 2	2	2	-	-	-	-	-	-	-	-
CO 3	1	1	-	-	-	-	-	-	-	-
CO 4	1	1	-	-	-	-	-	-	-	-
CO 5	1	2	-	-	-	-	-	-	-	-

'0' is No Correlation, '1' is Slight Correlation (Low level), '2' is Moderate Correlation (Medium level) and '3' is Substantial Correlation (High level).

Course Content

Content for Classroom transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	Forensic DNA Analysis & Finger Printing			
	1.1	Sources of DNA, extraction/ isolation of DNA from stains, tissues, hair, nails, buccal swabs, blood, semen and other samples. FTA cards for isolation of DNA. DNA typing systems – length polymorphisms, short tandem repeats and single nucleotide polymorphisms. Introduction to DNA profiling. Introduction to mitochondrial DNA and its forensic importance.	5	["1"]
	1.2	Fundamental principles of fingerprinting. Types of fingerprints. Fingerprint patterns. Fingerprint characters. Classification and cataloguing of fingerprint record. Automated Fingerprint Identification System. Significance of poroscopy and edgeoscopy	5	["2"]
	1.3	Latent fingerprints' detection by physical and chemical techniques. Mechanism of detection of fingerprints by different developing reagents. Application of light sources in fingerprint detection. Preservation of developed fingerprints. Digital imaging for fingerprint enhancement. Fingerprinting the deceased. Developing fingerprints on gloves.	5	["2"]
2	Volatile, Non-volatile, Metallic, Non-metallic and Food poison			
	2.1	Volatile and Non- volatile Poisons: - Nature, use, administrations, symptoms, post-mortem findings, fatal dose and fatal period, Metallic poisons: Nature, use, administrations, symptoms, post-mortem findings, fatal dose and fatal period,	8	["3"]
	2.2	Food Poisons: Introduction, Food poisoning due to chemical, bacterial and fungal, Sign and symptoms of food poisoning, collection and preservation of evidence material, extraction and isolation, from food material, biological material.	7	["3"]
3	Artificial Intelligence & Digital Forensics			
	3.1	Principles of Digital Forensics. Collection of Evidence- Single System, Networked System and Remote System. Digital Forensic Software and Hardware tools – Proprietary and Open Source Tools. Imaging and Analysis of Storage Media – Tools and Techniques. Computers facilitated crimes and reasons for attacks. Rules of Digital Forensic, Standard Operating Procedure (SOP) of Digital Crime Scene. Imaging and Hashing Digital Evidence. Analyzing and recovering deleted files and folders.	8	["4"]
	3.2	Introduction to Artificial Intelligence in Forensics, AI for Cybercrime Detection and Prevention, AI Techniques for Fraud Detection and Financial Forensics, Deep Learning for Facial Recognition and Biometric Analysis, AI in Digital Forensics and Data Recovery.	7	["4"]

Module	Units	Course Description	Hrs	CO No.
4	Forensic Chemistry Practica			
	4.1	1. Crime scene investigation (indoor/outdoor/mobile/water 2. Crime scene sketching (baseline method/polar coordinate method etc.) 3. Determination of pH of biological fluids using pH meter. 4. Preliminary forensic examination of body fluids. 5. To take plain and rolled fingerprints and to identify the patterns. 6. Examination of writing inks by TLC. 7. TLC analysis of explosive residues. 8. Identification of acidic and basic drug by UV/ TLC. 9. Identification of alcohol by chemical/ color test. 10. Examination of saliva and its stains.	30	["5"]

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** • Lecture (chalk & board, PowerPoint presentation) • Group Discussion • Peer interaction • Demonstration of Experiments • Hands on Training

Assessment Types

MODE OF ASSESSMENT
Mode of Assessment: Both

A. Continuous Comprehensive Assessment (CCA)
• Theory – 25 Marks
Quiz /Assignment / Class test
• Practical – 15 Marks
Lab involvement and skill Report of lab works done

B. End Semester Evaluation (ESE)
• Theory – 50 Marks
Assessment Methods – Written examination
Duration of Examination – 1.50 Hrs
Pattern of examination for Theory – Non-MCQ
Different parts of written examination – Part - A , B , C , D
Answer Type:
∘ PART - A
∘ MCQ - (10 out of 10) – 10 × 1 = 10
∘ PART - B
∘ Short answer - (4 out of 6) – 4 × 3 = 12
∘ PART - C
∘ Short Essays - (2 out of 3) – 2 × 7 = 14
∘ PART - D
∘ Essays - (1 out of 2) – 1 × 14 = 14
• Practical – 35 Marks
Assessment Methods – i. Viva voce: 10 marks ii. Experiment: 15 marks iii. Writing procedure: 5 marks iv. Certified lab report: 5 marks
Duration of Examination – 2.00 Hrs

References

- S.K. Lahiri; Elements of medical jurisprudence, Prabasi press, (1973)
- I.Gordon & H.A.Shapiro; Forensic medicine, Longman group Ltd., (1982)
- K,S Narayan Reddy; The Essentials of Forensic Medicine and toxicology.
- Krishan Vij Text Book of Forensic Medicine and Toxicology.
- Rajesh Bardale; Principles of Forensic Medicine and Toxicology.
- V. V. Pillay; Text Book of Forensic Medicine and Toxicology
- "Artificial Intelligence and Machine Learning for Business: A No-Nonsense Guide to Data Driven Technologies" by J. Allaire

and C. Johnson
- "Handbook of Forensic Analysis and Artificial Intelligence" edited by S. Anuradha and N. Devarajan
- Mclay, W.D.S; Clinical forensic medicine, Cambridge University Press, London, 1990.
- Polson C.H; Essentials of forensic medicine, Pergamon press, London, 1973
- Curtis Klaassen, Casarett & Doll Toxicology: The Basic Science of poisons, 8th Edtion, Mc Graw Hill,2013
- Moffat, A.C.: Osselton, D. M. Widdop, B.: Clarke's Analysis of Drugs and Poisons in Pharmaceuticals, body fluids and postmortem material, 3rd ed., Pharmaceutical Press,2004.
- Holfmann, F.G.: Handbook of Drug and Alcohol Abuse.
- Reject Paul. M.P, Forensic Toxicology, SSBT, New Delhi, 2009 6. Sunshine, I: Guidelines for Analytical Toxicology Programme, Vol-I, CRC press, 1950.

Affidavit

- We, Bishop Abraham Memorial College, Thuruthicaud and Dr Sini Jacob, retain the copyright of this syllabus and expressly prohibit its distribution in complete form to any institution outside our own.
- We, Bishop Abraham Memorial College, Thuruthicaud, agree to appoint a new course coordinator for the proposed Forensic Chemistry in the event of the unavailability of the currently nominated coordinator. This appointment will ensure the continued coordination of course delivery, assessments, and all related academic responsibilities necessary for the successful implementation of the specialization, for as long as the college offers this programme.
- We, Bishop Abraham Memorial College, Thuruthicaud and Dr Sini Jacob, declare that no part of this signature course submitted here for approval has been taken from the course content developed by, or from any of the course titles prepared by, the BoS/expert committee in the same discipline under our University.