CHAITANYA

(Deemed to be University)

B.Sc., Forensic Science

(*wef* 2023-2024)

Learning Outcomes-based Curriculum Framework for Forensic Science

I, II, III and IV Semesters

1. Introduction

The learning outcomes-based curriculum framework for a B.Sc. degree in Forensic Science is intended to provide a broad framework within which Forensic programs that respond to the needs of students and to the evolving nature of Forensic Science as a subject could be developed. The framework is expected to assist in the maintenance of the standard of forensic degrees/programs across the country and periodic program review within a broad framework of agreed expected graduate attributes, qualification descriptors, program learning outcomes and course-level learning outcomes. The framework, however, does not seek to bring about uniformity in syllabi for a program of study in Forensic Science, or in teaching-learning process and learning assessment procedures. Instead, the framework is intended to allow for flexibility and innovation in program design and syllabi development, teaching-learning process, assessment of student learning levels.

2. Nature and extent of the B.Sc. degree program

Forensic Science is recognition, identification, analysis and reporting of physical as well as digital evidence by using various scientific methods and/or techniques for the purpose of justice of administration. In simple word, it is the science which help in solving criminal investigation. From the ancient time crime is non removable part of our society. Every day, every minute and in every second criminal activity has been taking place and with increase in frequency of crime there is proper procedure for solving crime which is developed by forensic science. Today, in each and every field crime has been taking place such as murder, robbery, rape, cyber-crime, kidnapping, money laundering, etc. Forensic Science has many branches such as Forensic Physics which deals with the glass analysis, soil analysis, etc. Forensic Ballistics includes study of firearms, bullets and cartridges. Forensic Biology includes study of bones, skeleton system, plant material, animal body part, and DNA analysis. Forensic Chemistry and Toxicology includes study of harmful chemicals and Poisons. Forensic Psychology includes study of human behavior. Digital Forensic includes crime related to digital devices such as computer, mobile, internet, etc.

3. Aims of the Bachelor's Degree program in Forensic Science

- Students will understand history of forensic science, development and its role in criminal investigation.
- Application of a computer to everyday tasks using standard procedures
- Need to effectively protect and process various physical evidences at SoC
- Documents and finger impressions can be used for the identification of culprit.
- How to protect ourselves from various kinds of cyber attacks
- Importance of biological evidences encountered in crime scene investigation.
- Applications of Chemistry and Ballistics for criminal investigation
- Investigation techniques, requirement and analyzing of digital evidences are covered.
- Mobile devices and its analysis in solving the crimes.

4. Characteristic attributes of a graduate in Forensic Science

Some of the characteristic attributes of a graduate in Forensic Science may include the following

- Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
- Effective Communication: Speak, read, write and listen clearly in person and through

electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

- Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.
- Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
- Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
- Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
- Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

5. Program learning outcomes relating to B.Sc. degree programme in Forensic Science

After successful completion of B.Sc. Forensic Science, students will be able to

- Understand the crime and crime scene management procedure.
- Describe the various instrumental techniques (Analytical Techniques)
- Understand the evidence collection and analysis of physical evidence and digital evidence.
- Analyze the personality of the person. Assessment of criminal tendency of the person.
- Understand the legal aspect of crime and criminal activities by studying IPC, CrPC, IEA, etc.
- Analyse physical evidence such as soil, paint, dust, glass, etc.

6. Employability Potential of the Programme:

With increase in modernization in today's society, scope of crime also increases. To handle and solve the crime we need specialist peoples and study of forensic science build a very strong manpower for dealing this situation. When a student study forensic science then he/she can do work in following sectors. ▪ Investigation Agency ▪ Pharmaceutical Industry ▪ Chemical Firms ▪ Biological Firms ▪ Research Centers ▪ Public Relations ▪ Academic Institutions ▪ Journalism ▪ Judicial System

Mentioned below are some of the employability potentials for Forensic Science graduates:

1. Students can do Ph.D. at IITs, NITs, IISERs, IISc, BARC, TIFR, CSIR, Universities, Colleges by clearing NET-JRF, GATE or PET examinations.
2. Students can do Ph.D. from foreign Universities; students may get scholarships.
3. Students can take teaching jobs at Universities or Sr. colleges by clearing SET or NET-LS examinations.
4. Research Scientists in various Public Sector Units like ONGC, IOCL, NTPC and Private sector industries.
5. Students can become security analyst, penetration tester, software developers in IT industries.
6. Students can become Quality Control Chemists/ Food Inspector at Food Co-operation of India, Food Safety and Standards etc.
7. Student can become Investigator, Forensic Scientist.
8. Laboratory technicians to look after sophisticated instruments like NMR, Mass Spectrometer, UV-Visible Spectrophotometer, Single crystal machines, XRD, SEM,

AAS, TEM etc.

9. Technician for repairing sophisticated instruments
10. Student can become medico legal officer
11. Research Scientist/ Operations Manager/ Chemists / Quality Manager / Research Manager at various industries like Pharmaceuticals, Cement, Plastic, Drugs, Paint, Dyes, Agricultural sector etc.
12. Student can become Small or medium scale entrepreneur (own industry) for investigation purpose and for preventive forensic.
13. Students can become Government officers by clearing UPSC, MPSC, Bank Probationary officers, other competitive examinations
14. Employee at Security Printing and Minting co-operation of India
15. Employee at Office in Indian Army, Navy and Air force.
16. Forensic Science student work for police system and also work as an investigator.
17. Forensic Science students also work in central investigative agency like CBI, IB, NIA and for other force like BSF, NSG, BPRD, NCRB.
18. Forensic Science student also work in journalism.
19. Forensic science students work in judicial process.
20. Free-lancer as educational you tube videos maker
21. Educational-aid maker
22. Free-lancer for creating awareness against Forensic Science

Government jobs:

There are a variety of career prospects waiting to be tapped at the government level. Because there is also a wide scope of research. Some of the government positions that can be considered are- ● Senior Research Associate ● Laboratory Technologist ● Research Analyst ● Research Officer ● Warehouse Supervisor ● Scientist ● Assistant Professor ● Development Supervisor ● Quality Management Analyst ● Software Developer ● Investigator

Course Structure

The B.Sc. program consists of 144 credits in accordance with the Choice Based Credit System (CBCS) approved by the UGC with 1 weekly -contact-hour for each credit for theory/tutorials and 2 weekly-contact-hours for each credit of laboratory work.

1. Credit-wise Distribution - Out of 144 credits, 108 credits are equally divided among three optional subjects, denoted as A, B and C, (36 credits each). 36 credits for each subject are further distributed as 24 credits for Core Compulsory Courses (CC) and 12 credits for Discipline Specific Electives (DSE). There are 8 credits for Ability Enhancement Compulsory Courses. SEC's will have 16 credits.
2. Course-wise Distribution - There are 4 CC courses for each optional subject. Each CC course is of 6 credits (4 Theory + 2 Practicum). Similarly, there are 2 DSE papers, each of 6 credits. There are 4 Skill Enhancement Courses (SEC) each of 4 credits with a total of 16 credits. 16 credits of SEC are distributed as 12 credits (3 courses) for optional A, B & C and 4 credits (1 course for open elective). There are four AECC namely, English-I, English-II, Environ mental Sciences and Basic computer skills with 2 credits.
3. Semester-wise Distribution – B.Sc. with Optional-A is a 3-Yr program with 6 semesters. In each semester, there will be 22 credits. For each of first four semesters, there will be 3 CC, one each for subjects A, B and C accounting to 18 credits. Similarly, for semesters 5 and 6, there will be 3 DSE in each semester and one DSE for each of three subjects (A, B

and C). AECC will be offered in first two semesters. SEC will be offered in semesters 3, 4, 5 and 6 and a student is required to take any one SEC from a pool of options..

A student can take more than 144 credits in total (but not more than 148 credits) to qualify for the grant of the B.Sc. degree after completing them successfully as per rules and regulations of the HEI.

Table presents the structure in a schematic form:

CBCS COMMON CORE SYLLABI FOR B.Sc.

SEMESTER – I							
CODE	**COURSE TITLE**	**COURSE TYPE**	**HPW**	**CREDITS**	**Internal Marks**	**External Marks**	**Total Marks**
	English	AECC-I	2	2	15	35	50
	Environmental Sciences	AECC-II	2	2	15	35	50
	Introduction to Forensic Science & Criminology	CC1 - A	4	4	30	70	100
	Fundamentals of Computer	CC1 - B	4	4	30	70	100
	Chemistry-I	CC1 - C	4	4	30	70	100
	Forensic Science Lab	CC1 - A - P	3	2	15	35	50
	Fundamentals of Computer Lab	CC1 - B - P	3	2	15	35	50
	Chemistry-I Lab	CC1 - C - P	3	2	15	35	50
	Seminar		3	2	15	35	50
	TOTAL		28	**24**	**180**	**420**	**600**

SEMESTER – II							
CODE	**COURSE TITLE**	**COURSE TYPE**	**HPW**	**CREDITS**	**Internal Marks**	**External Marks**	**Total Marks**
	English	AECC-III	2	2	15	35	50
	Basic Computer Skills	AECC-IV	2	2	15	35	50
	Crime Scene Management	CC2 - A	4	4	30	70	100
	Networking and Security	CC2 - B	4	4	30	70	100
	Chemistry-II	CC2 - C	4	4	30	70	100
	Crime Scene Management Lab	CC2 - A - P	3	2	15	35	50
	Networking and Security Lab	CC2 - B - P	3	2	15	35	50
	Chemistry-II Lab	CC2 - C - P	3	2	15	35	50
	Seminar		3	2	15	35	50
	TOTAL		28	**24**	**180**	**420**	**600**

SEMESTER – III							
CODE	**COURSE TITLE**	**COURSE TYPE**	**HPW**	**CREDITS**	**Internal Marks**	**External Marks**	**Total Marks**
	Forensic Nanotechnology & Poisoning	SEC-I	4	4	30	70	100
	Questioned Documents & Finger Impressions	CC3 - A	4	4	30	70	100
	Cyber Security	CC3 - B	4	4	30	70	100
	Chemistry-III	CC3 - C	4	4	30	70	100
	Questioned Documents & Finger Impressions Lab	CC3 - A - P	3	2	15	35	50
	Cyber Security Lab	CC3 - B - P	3	2	15	35	50
	Chemistry-III Lab	CC3 - C - P	3	2	15	35	50
	Seminar		3	2	15	35	50
	TOTAL		28	**24**	**180**	**420**	**600**

SEMESTER - IV							
CODE	**COURSE TITLE**	**COURSE TYPE**	**HPW**	**CREDITS**	**Internal Marks**	**External Marks**	**Total Marks**
	Spectroscopy and Chromatography	SEC-II	4	4	30	70	100
	Forensic Biology & DNA Fingerprinting	CC4 - A	4	4	30	70	100
	Digital Forensics	CC4 - B	4	4	30	70	100
	Chemistry-IV	CC4 - C	4	4	30	70	100
	Forensic Biology & DNA Fingerprinting Lab	CC4 - A - P	3	2	15	35	50
	Digital Forensics Lab	CC4 - B - P	3	2	15	35	50
	Chemistry-IV Lab	CC4 - C - P	3	2	15	35	50
	Seminar		3	2	15	35	50
	TOTAL		28	**24**	**180**	**420**	**600**

AECC: Ability **E**nhancement **C**ompulsory **C**ourse	08 credits
SEC: Skill **E**nhancement **C**ourse	16 credits
CC : Core Compulsory	72 credits
DSE: Discipline **S**pecific **E**lective	36 credits
Seminars	12 credits
Total	144 credits

Non CGPA Courses 12 credits*

NCC	2 credits
NSS	2 credits
Community Service	2 credits
Extra Curricular activities	2 credits
Farming	2 credits

Sports and Games 2 credits

*Non CGPA courses credits are not counted for CGPA calculation. Student should acquire minimum 4 Non CGPA credits to get degree.

Marks Distribution:

Theory:
Internal Marks: 30

First Internal – 10 marks
Second Internal – 10 marks
Assignment – 10 marks

External Marks : 70

Sections – A

10 Shorts questions
5 questions to be answered
5 x 2 = 10 marks

Section –B

8 Long questions
5 questions to be answered
5 x 12 = 60

Practical:

Internal Marks: 15

5 marks for attendance
10 marks for internal exam

External Marks: 35

5 marks for record
5 marks for viva-voce (written or oral)
25 marks for experiment

QUESTION PAPER PATTERN

FACULTY OF SCIENCE
B.Sc. (OPTIONAL)
Title of the Paper: XXXXXX

Duration: 3 Hours] **[Max Marks=70M**

SECTION-A
Short Answer type questions
Answer any FIVE questions

[5 X 2= 10M]

1. **UNIT-I**
2. **UNIT-I**
3. **UNIT-II**
4. **UNIT-II**
5. **UNIT-III**
6. **UNIT-III**
7. **UNIT-IV**
8. **UNIT-IV**

SECTION-B
Essay Answer type question
Answer and FIVE questions

[5 X 12 = 60M]

9. **UNIT – I**
10. **UNIT - I**
11. **UNIT – II**
12. **UNIT – II**
13. **UNIT – III**
14. **UNIT – III**
15. **UNIT – IV**
16. **UNIT - IV**