

**Faculty of Physical Sciences**  
**Ordinance, Curriculum & Syllabus**  
**Bachelor of Science (Forensic Science)**  
**(2018-19)**



**Shree Guru Gobind Singh Tricentenary**  
**University, Gurugram (Haryana)-122505, India**



# BACHELOR OF SCIENCE [B.Sc.]

## COURSE ORDINANCE

### 1. PREAMBLE

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

The UGC has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system.

Faculty of Physical Sciences. Shree Guru Gobind Singh Tercentenary University, Gurugram with the aim to enhance academic standards in quality of higher education has adopted the UGC guide lines as such in UG courses.

The grading system is considered to be better than the conventional marks system and in order to facilitate student mobility across institutions with in India and across countries the community grade point average (CGPA) has been introduced in the UG courses. The guidelines as follows,

### CHOICE BASED CREDIT SYSTEM (CBCS):

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

### Outline of Choice Based Credit System:

- a. **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
- b. **Elective Course:** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.
  - i. **Discipline Specific Elective (DSE) Course:** Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).
  - ii. **Dissertation/Project:** An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate



studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project.

- c. **Skill Enhancement Course:** The course based upon the content that leads to Knowledge enhancement.
- d. **Open Elective Course:** In order to adopt the inter disciplinary approach open elective course introduced, there exist a university basket having papers from the discipline other than Faculty of Physical Sciences. Student has to opt four papers each of two credits of his/her choice from the basket. He/She has to pass at least two papers of four credits..

## 2. GOALS:

- i. Employment prospects for under graduates are very good. The scientific knowledge and mathematical and analytic skills acquired help to place across a wide range of industries including aerospace, pharmaceutical, dyes, fabrics, electronics, semiconductors, petroleum, communications, computing, education, commerce, civil services and many more.
- ii. The course will build a rich knowledge base to provide a foundation for the continued study of science.
- iii. The theoretical and experimental skills necessary to analyze and solve a range of advances problems, providing an excellent foundation for leadership.

## 3. OBJECTIVES

The undergraduate training should enable the student to:

- i. Practice efficiently various investigative procedures backed by scientific knowledge including basic sciences and skills.
- ii. Get expertise in his/her field of interest
- iii. Play the assigned role in the implementation of required practical skills.
- iv. Be a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or is practicing and use appropriate learning resources.
- v. Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards.
- vi. The student is expected to know his subject in depth; however, emphasis should be on the analytical techniques. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority.
- vii. Competence in skills commensurate with the specialty (actual hands-on training) must be ensured.

## 4. Duration and Nomenclature of the Course:

The duration of B.Sc (Non Medical/ Forensic Science (H)) course shall be of three academic years consisting of six (6) semesters (15-17 weeks) under Credit Based System (CBS). On successful completion of all the six semesters, the student will be awarded B. Sc. Degree in the concerned course. The student shall complete the course within a maximum period of five (5) years from the date of admission to the first semester, failing which he/she will be disqualified from the course.

## 5. Admission to the Course:

### i. Eligibility for Admission:

The candidate seeking admission to B.Sc.(Non-medical) course must have passed Senior Secondary Examination (10+2) of the Board of School Education Bhiwani Haryana or any other examination recognized by SGT University as equivalent thereto, with at least 45 % marks (40%



marks in case of SC/ST candidates of Haryana State only) in Physics, Chemistry and Math taken together both in qualifying and/or competitive examinations and must have passed in the subjects of Physics, Chemistry, Math and English individually in the qualifying examination.

The candidate seeking admission to B.Sc.(H) Forensic Sciences course must have passed Senior Secondary Examination (10+2) of the Board of School Education Bhiwani Haryana or any other examination recognized by SGT University as equivalent thereto, with at least 50 % marks (45% marks in case of SC/ST candidates of Haryana State only) in Physics, Chemistry and Biology taken together both in qualifying and/or competitive examinations and must have passed in the subjects of Physics, Chemistry, Biology and English individually in the qualifying examination.

**ii. Schedule of admission and payment of fees:**

The admission schedule, along with last date for the submission of admission forms and Payment of fees shall be fixed by the Vice-Chancellor from time to time.

**6. Mode of Selection of Candidates for Admission:**

The candidates shall be selected for admission to the above course on the basis of their academic merit to be determined on the basis of marks obtained either in Entrance Examination conducted by SGT University, or in the qualifying examination as decided by the University from time to time.

**7. Syllabus:**

The syllabus recommended by University Grants Commission (UGC) has been adopted as such. It is based on Choice Based Credit System (CBCS) and is recommended by Board of Studies and approved by Academic Council from time to time.

**8. Scheme of Examination, distribution of marks, credit system and Syllabus:**

The Scheme of examination, distribution of marks in various papers along with the credit system and the syllabus of the course shall be as approved by Board of Studies/Academic Council from time to time.

**9. Medium of Instruction and Examination:**

The medium of the instruction and the examination shall be English only.

**10. Attendance Requirements/Eligibility to Appear in Examination:**

The student should fulfill the following criteria to be eligible for appearing in the End Term Semester Examinations:

- i. He/she should bear a good moral character.
- ii. He/she should be on the rolls of the Dept./Faculty of the University during the semester.
- iii. He/she should have 75% of the attendance during the respective semester. Twenty five per cent (25%) of attendance relaxation shall account for illness and contingencies of serious and unavoidable nature.
- iv. The Dean of the Faculty of his own or on the recommendation of the HoD shall have the power to give relaxation upto 5% on genuine grounds over the minimum 75% attendance.
- v. Further, the Vice Chancellor of his own or on the recommendation of the Dean shall have the power to give further relaxation upto 5% on genuine grounds over the above mentioned minimum attendance.
- vi. He/she should not be a defaulter in payment of any dues of the SGT University and no disciplinary action is pending against the student.

**11. Exemption from Attendance / Shortage of attendance to be condoned:**

The shortage of lecture to the maximum limit as under can be condoned by the competent authority:



Sr. No	Exemptable No. of Lecture	Ground of Exemption	Competent Authority
1	All periods of the days of blood donation	Voluntarily blood donation to the Blood Bank.	Dean of the Faculty
2	All periods of the day of Examination	For appearing in the supplementary examinations(Theory /Practical/Viva-voce)	-do-
3	10 days attendance during a semester	For participation in University or Inter-Collegiate Sports Tournaments/ Youth Festivals, NCC/NSS Camps/University Educational Excursions/ Mountaineering Courses	-do-
4	15 days attendance during a semester	For participation in Inter-University Sports Tournaments/ Youth Festivals	-do-

**Provided:**

- that he/she has obtained prior approval of the Dean, Faculty of Physical Sciences;
- that credit may be given only for the days on which lectures were delivered or tutorials or practical work done during the period of participation in the aforesaid events.

**12. Attendance Shortage Warning:**

Attendance shortage warning will be displayed on the Faculty's Notice Board and University Website by 10<sup>th</sup> day of every month.

**13. Detained students**

A student, who does not fulfill the criteria prescribed in Clauses 10-11, will not be eligible for appearing in the End Term Semester Examination in that particular paper and will be deemed as detained in that paper. Such student will repeat the course/paper along with the regular students of the subsequent batch to fulfill the prescribed conditions to appear in the "End Term" examination of the course/ paper.

**14. Submission of Examination Forms and Payment of Examination Fee:**

The Dean, Faculty of Physical Sciences shall submit the examination admission forms of those students who satisfy the eligibility criteria to appear in the examinations to the Controller of Examinations as per schedule of examination circulated by him from time to time.

**15. University Examinations:**

**i. End Term Semester Examinations:**

The examination for the 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> semesters (Odd Semesters) shall ordinarily be held in the month of December and of the 2<sup>nd</sup>, 4<sup>th</sup> and 6<sup>th</sup> semesters (Even Semesters) in the month of May/June. The examination dates are fixed by the controller of examination with the approval of Vice Chancellor.

**ii. Fail/ Reappear candidates:**

Fail / re-appear candidate of the odd semesters (1<sup>st</sup>, 3<sup>rd</sup> & 5<sup>th</sup>) will take re-appear exams as an ex-student in the subsequent exams of the odd semesters (1<sup>st</sup>, 3<sup>rd</sup> & 5<sup>th</sup>). Similarly,

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for the even semesters (2<sup>nd</sup>, 4<sup>th</sup> & 6<sup>th</sup>), he/she will take re-appear exams in the subsequent exams of the even semesters (2<sup>nd</sup>, 4<sup>th</sup> & 6<sup>th</sup>). However, a candidate appearing in the 6<sup>th</sup> semester examination (Regular) may appear simultaneously in his/her re-appear paper(s) of previous semesters. The examination dates are fixed by the controller of examination with the approval of Vice Chancellor.

**16. Improvement Examination:**

The student may be permitted to improve his/her result subject to the following conditions:

- i. The student will be permitted to appear in improvement examination as an ex-student with regular batches.
- ii. The student will be permitted to improve his/her CGPA in one or all papers in which he/she has obtained CGPA less than 'First Division' in aggregate.
- iii. Only one chance per paper will be given. The chance must be availed of within a year of initially passing of the every semester examination.
- iv. The candidate will be required to apply and allowed to appear only for theory examinations.
- v. If the status/nature of the student's result does not improve by five (05) or more per cent, his/her improvement result will be declared "PRS" (Previous Result Stands).
- vi. The candidate shall be allowed to appear in the improvement examination(s) along with regular candidates as and when the course is offered. No separate examination will be held for improvement of result. In case of change of syllabi, the student shall have to appear for improvement in accordance with the changed syllabi of the concerned course applicable to the regular students of that exam.

**17. Setting of Question Papers:**

- i. The Head of the Department/Dean of the Faculty shall supply the panel of internal and external examiners duly approved by the Board of Studies to the Controller of Examinations. The paper(s) will be set by the examiner(s) nominated by the Vice-Chancellor from the panel of examiners.
- ii. An examiner shall be allowed to set not more than two papers in a semester examination.
- iii. The examiner(s) will set the question papers as per criteria laid down in the Scheme of Examinations as approved by the Board of Studies/Academic Council of the University.

**18. Evaluation Process – Theory and Practical:**

**Evaluation of Answer Books:**

The answer books may be evaluated either by the paper setter or any other internal or external examiner to be nominated by the Controller of Examinations with the approval of the Vice-Chancellor from the panel of examiners approved by the Board of Studies.

**Re-evaluation of Answer Books:**

Re-evaluation/ rechecking of any paper is allowed. The students can apply for Re-evaluation/ Re-checking of any paper to the Controller of Examinations through the HoD/Dean of the Faculty within 10 days of the declaration of result by paying prescribed fee.

**Practical Examinations - Appointment of Examiner:**

- a. The practical examinations shall be conducted by a Board of two Examiners consisting of one internal and one external examiner to be nominated by the Vice-Chancellor from the panel of examiners.

**Marks Distribution:**

The distribution of marks in examination of the practical paper will be as per the criteria given below:

- a. Experimental performance = 60% marks

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A. S. Gupta



- b. Viva-Voce = 30% marks
- c. Laboratory work report = 10% marks

**19. External Assessment (Summative Assessment):**

Sixty per cent marks shall be assigned to each theory and practical paper as Summative Assessment. The distribution of marks in theory as well as practical papers will be in accordance to IQAC guidelines.

**20. Internal Assessment (Formative Assessment):**

**i. Theory Paper:**

Forty per cent marks shall be assigned to each theory paper as Internal Assessment which shall be awarded as per the criteria given below:

**Theory paper:**

- a. Attendance = 10 %
- b. Mid-term Class Test = 20 %
- c. Assignment/Quiz/Seminar etc. = 10 %

**ii. Practical paper:**

Forty per cent marks shall be assigned to each practical paper as Internal Assessment which shall be awarded as per the criteria given below:

- i. Attendance = 10 %
- ii. Regular experimental performance = 10 %
- iii. Mid-term Internal Viva = 10 %
- iv. Laboratory work report = 10 %

iii. In case of ex-students, those appearing for re-appear / improvement examination in any semester, their previous Internal Assessment marks will be counted. If there is any change in Scheme of Examination, then Internal Assessment marks will be modified accordingly.

iv. The concerned teacher shall preserve records on the basis of which the Internal Assessment has been awarded and shall make the same available to the Controller of Examinations whenever required.

v. The Head of the Department/ Dean of the Faculty shall ensure:

- ✓a. That the internal assessment marks are displayed for information of the students at least seven (07) days before the commencement of the examinations of each semester
- b. That the internal assessment marks are submitted to the Controller of Examinations at least seven (07) days before the commencement of the examinations of each semester.

**21. Criteria for Promotion to Higher Semester:**

All the students will be automatically promoted to 2nd, 4th and 6th semester without any condition of passing minimum number of papers. For promotion from 2nd to 3rd semester, the student shall have to clear at least 50% papers of 1st semester; for promotion from 4th to 5th semester, the student shall have to clear at least 50% papers of 1st, 2nd and 3rd semesters taken together.

**22. Credit Based Grading System:**

**i. Key Definitions:**

Programme	An educational programme leading to award of a Degree, Diploma or Certificate.
Course	Usually referred to as 'paper' is a component of a programme. All courses

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	need not carry the same weight.
Credit	A unit by which the course work is measured. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours for practical work/field work per week. A Research Based Paper /Project is equal to 5 credits.
Credit Point	It is the product of grade point and number of credits for a course i.e. Credit Point = No. of credits in a course X "grade value" of the grade obtained in the course.
Grade Point	There are two types of GPAs as given hereunder:
Average (GPA)	Semester Grade Point Average (SGPA) Cumulative Grade Point Average (CGPA) Every student earns a distinct SGPA and a distinct CGPA at the end of each specified semester.
SGPA	SGPA is a measure for performance of student in a Semester. It is the Point Average ratio of sum of the product of number of credits with the grade points scored by the student in all the courses taken by him/her and the sum of the number of credits of all the Courses undergone by the student i.e. $SGPA (Si) = \frac{\sum (CixGi)}{\sum Ci}$
CGPA	CGPA is a measure of performance up to any Grade Grade specified semester Point Average beginning from the first Semester. It is also calculated in the same (CGPA) manner as SPGA taking into account all the courses undergone by a student over all the semesters of programme i.e. $CGPA = \frac{\sum (Cix Si)}{\sum Ci}$
Grade Point	It is a numerical weight allotted to each letter grade on a 10-point scale.
Letter Grades	It is an index of the performance of a student in a said course. The Grades are denoted by letters O, A+, A, B+, B, C, P, F and Ab.

## ii. Credits, Semesters, Courses and total Credit Points:

S. No	Course	Semesters	Theory Credits	Practical credits	Project/ Industrial Training Credits	Open Elective	Total Credits
1	B.Sc.(Non Medical)	6	94	24	0	8	126
2	B.Sc.(H) Forensic Science	6	136	42	0	8	186

## iii. Grading Method

The grading system will be adopted on a 10 point scale. The grades will be awarded based on marks out of 100 and will be converted into grades as under:

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## Grading Table

Range of Percentage of Marks	Letter Grade	Grade Points	Range of Grade Points	Classification
90 and above	O (Outstanding)	10	9-10	Outstanding
80 & above but less than 90	A+ (Excellent)	9	8 < 9	Excellent
70 & above but less than 80	A (Very Good)	8	7 < 8	1 <sup>st</sup> Div with Distinction
60 & above but less than 70	B+ (Good)	7	6 < 7	1 <sup>st</sup> Division
50 & above but less than 60	B (Above Average)	6	5 < 6	2 <sup>nd</sup> Division
Above 40% but less than 50%	C (Pass Average)	5	Above 4 < 5	3 <sup>rd</sup> Division
40%	P (Pass)	4	4	Pass
Less than 40	F (Fail)	0	-	Fail

Formula for Calculating percentage of marks:

CGPA  $\times$  10. e.g.  $6.53 \times 10 = 65.3$

Formula for calculating Grade Point:

$G = (\text{marks obtained in paper} / \text{total marks of paper}) \times 10$

Formula for Computation SGPA & CGPA

- i. The SGPA is the ratio of sum of the product of the number of credits with the grad points scored by a student in all the courses taken by a students and the sum of the number of credits of all the courses taken by the students ; i.e

$SGPA (S_i) = \sum (C_i \times G_i) / \sum C_i$  where  $C_i$  is the no of credits of the ith course and  $G_i$  is the grad point Scored by the student in the ith course

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by the students over all the students over all the semesters of a programme , i.e

$CGPA = \sum (C_i \times S_i) / \sum C_i$

Where  $S_i$  is the SGPA of the ith semester and  $C_i$  is the total number of credits in that semester.

- iii. The SGPA and CGPA Shall be rounded up to 2 decimal points and reported in the transcripts. Result-Cum-Detailed Marks Card/ Transcript: Based on the above recommendations on letter grades, grade points and SGPA and CGPA, the DMC/ Transcript for each semester and a consolidated transcript in dictating the performance in all semester may be issued



# 1. Illustration of Computation of SGPA and CGPA and Format for Transcripts

Course	Credit	Grade Letter	Grade Point	Credit Points (Credit $\times$ Grad)
Course 1	3	A	8	$3 \times 8 = 24$
Course 2	4	B +	7	$4 \times 7 = 28$
Course 3	3	B	6	$3 \times 6 = 18$
Course 4	3	O	10	$3 \times 10 = 30$
Course 5	3	C	5	$3 \times 5 = 15$
Course 6	4	B	6	$4 \times 6 = 24$
	20			139

Thus SGPA =  $139/20 = 6.95$

Similarly, Suppose the SGPA for 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> semester are 7.85, 5.6, and 6.0 with credits 22, 24 and 22, respectively, then for a two-year PG Programme, the CGPA will be computed as followed

$$\text{CGPA} = (20 \times 6.95 + 22 \times 7.85 + 24 \times 5.6 + 22 \times 6.0)/88 = 6.57$$

Course	Credits	Grade Letter	Grad Point Block	Range of Grad Points (Actual Grade Value as per marks obtained)	Earned Credit Point (Credit $\times$ Actual Grade Value)
Course 1	3	O	10	9.2	$3 \times 9.2 = 27.6$
Course 2	3	A+	9	8.2	$3 \times 8.2 = 24.6$
Course 3	4	A	8	7	$4 \times 7 = 28$
Course 4	3	B+	7	6.7	$3 \times 6.7 = 20.1$
Course 5	3	B	6	5.6	$3 \times 5.6 = 16.8$
Course 6	4	C	5	4.7	$4 \times 4.7 = 18.8$
	20				135.9

Thus SGPA =  $135.9/20 = 6.79$

Similarly suppose SGPA for 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> semester are 7.85, 5.6 and 6.0 with credits 22, 24, and 22 respectively

$$\text{CGPA} = (20 \times 6.79 + 22 \times 7.85 + 24 \times 5.6 + 22 \times 6.0)/88 = 6.53$$

Calculating percentage of marks

$$\text{CGPA} \times 10 \text{ E.G. } 6.53 \times 10 = 65.3$$

## 23. Pass criteria:

The minimum percentage of marks to pass the examination in each subject/paper will be 40% each in theory paper, practical /field work/Research Project etc. examination & internal assessment. The student has to pass in summative and formative (Internal) assessment separately.

*Dr. S. J. S.*

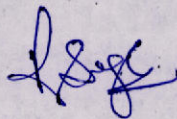


#### **24. Declaration of Results:**

- i. The Controller of Examinations shall declare the results as early as possible after the conclusion of each examination, but before the start of teaching for the next academic session.
- ii. Each successful student/ the student placed in reappear shall receive a copy of the Detailed Marks Certificate/ Grade Card Sheet of each semester examination.
- iii. The student whose result is declared late without any fault on his/her part may attend classes for the next higher semester provisionally at his /her own risk and responsibility, subject to his /her passing the concerned semester examination. In case, the student fails to pass the concerned semester examination, his/her attendance/internal assessment in the next higher semester in which he / she was allowed to attend classes provisionally will stand cancelled.

#### **25. Other Provisions:**

- i. Nothing in the Ordinance shall debar the University from amending the Ordinance and the same shall be applicable to all the students whether old or new.
- ii. Any other provision not contained in the Ordinance shall be governed by the rules and regulations framed by the University from time to time.
- iii. In case of any dispute, the Vice-Chancellor will be competent authority to interpret the rules and his interpretation shall be final.





# B. SC. (Hons.) (FORENSIC SCIENCES)

Paper Code	Nomenclature	Theory		Practical		Total Marks	Credits	Remarks	Session
		External Marks	Internal Marks	External Marks	Internal Marks				
SEMESTER - I									
08070101	Physics I	60	40	—	—	100	4		2018
08070102	Physics I - Practical	—	—	30	20	50	2	Practical	2018
08070103	Chemistry I	60	40	—	—	100	4		2018
08070104	Chemistry I - Practical	—	—	30	20	50	2	Practical	2018
08070105	Biology I	60	40	—	—	100	4		2018
08070106	Biology I - Practical	—	—	30	20	50	2	Practical	2018
08070107	Introduction to Forensic Science	60	40	—	—	100	4		2018
08070108	Crime, Society & Police Organizations	60	40	—	—	100	4		2018
08070109	English	60	40	—	—	100	2		2018
	Open Elective - I					50	9		
SEMESTER - II									
08070201	Chemistry II	60	40	—	—	100	4		2018
08070202	Chemistry II - Practical	—	—	30	20	50	2	Practical	2018
08070203	Biology II	60	40	—	—	100	4		2018
08070204	Biology II - Practical	—	—	30	20	50	2	Practical	2018
08070205	Crime Scene Investigation & Management	60	40	—	—	100	4		2018
08070206	Forensic Psychology	60	40	—	—	100	4		2018
08070207	Forensic Psychology - Practical	—	—	60	40	100	2	Practical	2018
08070208	Mathematics	60	40	—	—	100	2		2018
08070209	Computer Sciences	60	40	—	—	100	2		2018
	Open Elective - II					50	9		
SEMESTER - III									
08070301	Physics III	60	40	—	—	100	4		2018
08070302	Physics III - Practical	—	—	30	20	50	2	Practical	2018
08070303	Biology III	60	40	—	—	100	4		2018
08070304	Biology III - Practical	—	—	30	20	50	2	Practical	2018
08070305	Basic Instrumentation	60	40	—	—	100	4		2018
08070306	Economic Offences	60	40	—	—	100	4		2018
08070307	Introduction to Questioned Document	60	40	—	—	100	4		2018
08070308	Cyber Security	60	40	—	—	100	4		2018
08070309	Environmental Sciences	60	40	—	—	100	4	Subsidiary	2018
	Open Elective - III					50	9		

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# SEMESTER - IV

08070401	Fingerprints & other Impressions	60	40	—	—	100	6	2018
08070402	Fingerprints & other Impressions - Practical	—	—	30	20	50	2	2018
08070403	Forensic Engineering	60	40	—	—	100	6	2018
08070404	Forensic Engineering - Practical	—	—	30	20	50	2	2018
08070405	Digital Forensic & Photography	60	40	—	—	100	6	2018
08070406	Forensic Ballistic	60	40	—	—	100	6	2018
08070407	Forensic Ballistic - Practical	—	—	30	20	50	2	2018
08070408	Applied Instrumentation	60	40	—	—	100	6	2018
08070409	Applied Instrumentation - Practical	—	—	30	20	50	2	2018
	Open Elective - IV					50	2	

# SEMESTER - V

08070501	Advanced Forensic Biology	60	40	—	—	100	4	2018
08070502	Advanced Forensic Biology - Practical	—	—	30	20	50	2	2018
08070503	Forensic Chemistry - Drugs & Poisons	60	40	—	—	100	4	2018
08070504	Forensic Chemistry - Drugs & Poisons - Practical	—	—	30	20	50	2	2018
08070505	Forensic Physics	60	40	—	—	100	4	2018
08070506	Forensic Physics - Practical	—	—	30	20	50	2	2018
08070507	Anthropology & Personal Identification	60	40	—	—	100	4	2018
08070508	Anthropology & Personal Identification - Practical	—	—	30	20	50	2	2018
08070509	Quality Management	60	40	—	—	100	4	2018
08070510	French	60	40	—	—	100	2	2018
08070511	German	60	40	—	—	100	2	2018

# SEMESTER - VI

08070601	Forensic Serology	60	40	—	—	100	4	2018
08070602	Forensic Serology - Practical	—	—	30	20	50	2	2018
08070603	Forensic Toxicology	60	40	—	—	100	4	2018
08070604	Forensic Toxicology - Practical	—	—	30	20	50	2	2018
08070605	Forensic Medicine	60	40	—	—	100	4	2018
08070606	Forensic Medicine - Practical	—	—	30	20	50	2	2018
08070607	Forensic Odontology	60	40	—	—	100	4	2018
08070608	Forensic Odontology - Practical	—	—	30	20	50	2	2018
08070609	Dissertation	—	—	50	50	100	6	2018

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	CORE COURSES (6 Credits)	ABILITY ENHANCEMENT COMPULSORY COURSES(AECC) (2 Credits)	ELECTIVE DISCIPLINE SPECIFIC(DSE) (6 Credits)	ELECTIVE GENERIC Interdisciplinary/ Open Elective (4 Credits)
I	Crime,Society & Police Organization (Theory+Practical)	Communication Skill & Personality Development (AECC-1)		Open Elective-1
	Introduction To Forensic Sciences			
	Chemistry-I(Theory+Practical) GE-2			
	Biology-I (Theory+Practical) GE-3			
	Physics-I (Theory+Practical) GE-1			
II	Crime Scene Investigation & Management (Theory+Practical)	Fundamental of Computer Science (AECC-2)		Open Elective II
	Forensic Psychology (Theory+Practical)			
	Chemistry-II (Theory+Practical)			
	Biology-II (Theory+Practical)			
	Mathematics (Theory)			
III	Basic Instrumentation Theory+Practical)	Environmental Science (AECC-3)		<del>Cyber Security</del> <del>(Theory+Practical)</del> Open Elective-III

*Dr. S. S. S.*

*Asst*



	Forensic Ballistic (Theory+Practical)			Open Elective-III
	Introduction to Questioned Document(theory+Practical)			
	Biology-III(Theory+Practical)			
	Physics-II (Theory+Practical) GE-6			
IV	Fingerprint & Other Impressions (Theory+Practical)			
	Forensic Engineering (Theory+Practical)		Applied Instrumentation (Theory+Practical) GE-4	Open Elective-IV
	Digital Forensics & Photography (Theory+Practical) DS-3			
V	Advanced Forensic Biology (Theory+Practical)	Foreign Language AEEC-1	Anthropology & Personal Identification (Theory+Practical) DSE-1	
	Forensic Chemistry- Drugs & Poisons (Theory+Practical)			
	Forensic Physics (Theory+Practical)			
VI	Forensic Serology (Theory+Practical)		Quality Management (Theory+Tutorial) GE-2	
	Forensic Toxicology (Theory+Practical)			
	Forensic Medicine (Theory+Practical)			

*Sup Asta*



# FORENSIC SCIENCE (B.Sc)

## OVERVIEW OF CURRICULUM

### 1. CORE COURSES

YEAR	SEMESTER	PAPER NO.	NAME OF THE PAPER
FIRST	I	FS 101	INTRODUCTION TO FORENSIC SCIENCE
		FS 102	CRIME, SOCIETY & POLICE ORGANIZATIONS
			CHEMISTRY-1
			PHYSICS-1
			BIOLOGY-1
SECOND	II	FS 201	CRIME SCENE INVESTIGATION & MANAGEMENT
		FS 202	FORENSIC PSYCHOLOGY
			CHEMISTRY-II
			BIOLOGY-II
			MATHEMATICS
	III	FS 301	BASIC INSTRUMENTATION
		FS 302	INTRODUCTION TO QUESTIONED DOCUMENTS
			PHYSICS-II
			BIOLOGY-III
THIRD	IV	FS 401	FINGERPRINTS & OTHER IMPRESSIONS
		FS 402	FORENSIC ENGINEERING
		FS 403	FORENSIC PHOTOGRAPHY
	V	FS 501	FORENSIC BIOLOGY
		FS 502	FORENSIC CHEMISTRY
		FS 503	FORENSIC PHYSICS
	VI	FS 601	FORENSIC SEROLOGY
		FS 602	FORENSIC TOXICOLOGY
		FS 603	FORENSIC MEDICINE

### 2. ELECTIVE COURSES

GENERIC ELECTIVE	DISCIPLINE SPECIFIC	
<p>Three in each semester I, II, III to be chosen from the following:</p> <p>GE:1 Physics-I GE:2 Chemistry-I GE:3 Biology-I GE:4 Physics-II GE:5 Chemistry-II GE:6 Biology-II GE:7 Mathematics</p>	<p>Any one in semester IV &amp; V to be chosen from the following:</p> <p>GE:1 Anthropology &amp; Personal Identification GE:2 Quality Management GE:3: Research Methods &amp; Biostatistics GE-4 Applied Instrumentation</p>	<p>Two each in semester III, IV &amp; VI to be chosen as an Interdisciplinary / Open Elective from the following:</p> <p>DS:1 Economic offences DS:2. Cyber security DS:3 Forensic Odontology</p>

### 3. ABILITY ENHANCEMENT COURSES

Two each in semester I & II to be chosen from the following:

AEC:1 Communication Skills  
AEC:2 Environmental Studies  
AEC:3 Foreign Languages-I

*RSg* *Abm*



	<b>CORE COURSES (6 Credits)</b>	<b>ABILITY ENHANCEMENT COMPULSORY COURSES(AECC) (2 Credits)</b>	<b>ABILITY/SKILL ENHANCEMENT COURSES(6 Credits)</b>	<b>ELECTIVE GENERIC Interdisciplinary/ Open Elective (4 Credits)</b>
I	Crime,Society & Police Organization (Theory+Practical)	English (AECC-1)		
	Introduction To Forensic Sciences			
	Chemistry-I(Theory+Practical) GE-2			
	Biology-I (Theory+Practical) GE-3			
	Physics-I (Theory+Practical) GE-1			
II	Crime Scene Investigation & Management (Theory+Practical)	Computer Sciences (AECC-2)		
	Forensic Psychology (Theory+Practical)			
	Chemistry-II (Theory+Practical)			
	Biology-II (Theory+Practical)			
	Mathematics (Theory)			
III	Basic Instrumentation Theory+Practical)	EVS (AECC-3)		Cyber Security (Theory+Practical) (DS-2)
	Forensic Ballistic (Theory+Practical)			

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	Introduction to Questioned Document(theory+Practical)			
	Biology-III(Theory+Practical)			
	Physics-II (Theory+Practical) GE-6			
IV	Fingerprint & Other Impressions (Theory+Practical)			Economic Offences (Theory+Tutorial) DS-1
	Forensic Engineering (Theory+Practical)		Applied Instrumentation (Theory+Practical) GE-4	
	Forensic Photography (Theory+Practical)			
V	Advanced Forensic Biology (Theory+Practical)	Foreign Language AEEC-1	Anthropology & Personal Identification (Theory+Practical) (GE-1)	
	Forensic Chemistry- Drugs & Poisons (Theory+Practical)		Research Methods & Biostatistics(GE-3)	
	Forensic Physics (Theory+Practical)			
VI	Forensic Serology (Theory+Practical)		Quality Management (Theory+Tutorial) GE-2	Forensic Odontology (Theory+Practical) DS-3
	Forensic Toxicology (Theory+Practical)			
	Forensic Medicine (Theory+Practical)			

*Asst* *Asst*



### SUMMARY OF COURSE

Semester	Type of Course	Nature of course	Hours	Credits
I	Core Courses(5)	Theory	20	20
		Tutorial	2	
		Practical	12	6
	AECC (1)	Theory	2	2
		<b>Total</b>	<b>36</b>	<b>26</b>
II	Core Courses (5)	Theory	20	20
		Practicum	12	6
		Tutorial	1	
	AECC (1)	Theory	2	2
		<b>Total</b>	<b>35</b>	<b>28</b>
III	Core Courses (5)	Theory	20	20
		Practicum	8	4
		DSE(1)	4	4
	AECC(1)	Theory	2	2
		<b>Total</b>	<b>36</b>	<b>30</b>
IV	Core Courses (4)	Theory	16	16
		Practicum	16	8
		DSE(1)	4	4
		<b>Total</b>	<b>36</b>	<b>32</b>
V	Core Courses (3)	Theory	12	12
		Practicum	12	6
		DSE(1)	4	4
		Practicum	4	2
		AECC(1)	4	4
		Interdisciplinary(1)	4	4
		<b>Total</b>	<b>40</b>	<b>32</b>
VI	Core Courses (3)	Theory	12	12
		Practicum	12	6
		DSE(1)	4	4
		Practicum	4	2
		Interdisciplinary(1)	4	4
		<b>Total</b>	<b>40</b>	<b>30</b>

#### IV. Marks Scheme

The course carries a maximum of 4350 marks out of this 3200 are of theory and 1150 are of practical. Semester and paper wise details are as under:

*Dr. S. S. S. S.*      *Asst.*



**Semester I (Total Marks=750)**

S. No.	Corse Code	Course Title	Hrs/week	Total Marks	Credit
1.		Crime Society & Police Organization (Tutorial)	4+1	100	4
2.		Introduction to Forensic Science (Tutorial)	4+1	100	4
3.		Chemistry-1	4	100	4
4.		Biology-1	4	100	4
5.		Physics-1	4	100	4
6.		Chemistry-1 Practicum	4	50	2
7.		Biology-1 Practicum	4	50	2
		Physics-1 Practicum	4	50	2
8.		AECC-1	2	100	2

*R. Supp. Asoka*



**Semester II (Total Marks=800)**

S. No.	Course Code	Course Title	Hrs/week	Total Marks	Credit
1.		Crime Scene Investigation & Management	8	100	6
2.		Forensic Psychology	6	100	6
3.		Biology-II	4	100	4
4.		Chemistry-II	4	100	4
5.		Mathematics	4	100	4
6.		Forensic Psychology Practicum	4	100	2
7.		Biology-II Practicum	4	50	2
8.		Chemistry II Practicum	4	50	2
9.		AECC-2	2	100	2

*Signature*     *Asha*



**Semester III (Total Marks-800)**

S. No.	Course Code	Course Title	Hrs/week	Total Marks	Credit
1.		Basic Instrumentation	4	100	4
2.		Economic Offences	4	100	4
3.		Introduction to Questioned Document	6	100	6
4.		Biology-III	4	100	4
5.		Physics-II	4	100	4
6.		Cyber Security(Interdisciplinary)	4	100	4
7..		Biology-III Practicum	4	50	2
8.		Physics -II Practicum	4	50	2
9.		AECC-3	2	100	2

*Dr. S. S. Asoka*



**Semester IV (Total Marks=700)**

S. No.	Course Code	Course Title	Hrs/week	Total Marks	Credit
1.		Fingerprint & Other Impression	6	100	6
2.		Forensic Engineering	6	100	6
3.		Digital Forensics & Photography	6	100	6
4.		Forensic Ballistic	6	100	6
5.		Applied Instrumentation(DS E-1)	6	100	6
6.		Fingerprint & Other Impression Practicum	4	50	2
7.		Forensic Engineering Practicum	4	50	2
8.		Forensic Ballistic Practicum	4	50	2
9.		Applied Instrumentation Practicum	4	50	2

*R. Sangeetha*



**Semester V (Total Marks=800)**

S. No.	Course Code	Course Title	Hrs/week	Total Marks	Credit
1.		Advanced Forensic Biology	4	100	4
2.		Forensic Chemistry-Drugs & Poisons	4	100	4
3.		Forensic Physics	4	100	4
4.		Anthropology & Personal Identification (DSE-2)	4	100	4
5.		Quality Management (Interdisciplinary)	4	100	4
6.		Advanced Forensic Biology Practicum	4	50	2
7.		Forensic Chemistry-Drugs & Poisons Practicum	4	50	2
8		Forensic Physics Practicum	4	50	2
9.		Anthropology & Personal Identification Practicum (DSE-2)	4	50	2
10.		AEEC-1	2	100	2

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**Semester VI (Total Marks=700)**

S. No.	Course Code	Course Title	Hrs/week	Total Marks	Credit
1.		Forensic Serology	4	100	4
2.		Forensic Toxicology	4	100	4
3.		Forensic Medicine	4	100	4
4.		Forensic Odontology	4	100	4
5.		Forensic Serology Practicum	4	50	2
6.		Forensic Toxicology Practicum	4	50	2
7.		Forensic Medicine Practicum	4	50	2
8.		Forensic Odontology Practicum	4	50	2
9.		Dissertation(DSE-3)	12	100	6

*Raj Asta*



# SYLLABUS FOR OPEN ELECTIVE

## 1.CYBER SECURITY(III SEMESTER)

<b>Course contents:</b>
<b>Module I:</b>
Computer characteristics and classification, hardware and software, Computer languages, flow chart and algorithm.
<b>Module II:</b>
Networking and internet concepts, fundamentals of storage devices, file system, concepts of Operating System software, its review and major functions (DOS, UNIX, WINDOWS). Networking and its protocol, Fundamentals of Mobile communications
<b>Module III:</b>
Details about Windows, Windows accessories and other applications, Data storage and memory allocation, history of operating systems, various operating systems, Modern application softwares.
<b>Module IV Fundamentals and Concepts</b>
Fundamentals of computers Hardware and accessories – development of hard disk, physical construction, CHS and LBA addressing, encoding methods and formats. Memory and processor. Methods of storing data. Operating system. Software. Introduction to network, LAN, WAN and MAN.
<b>Module V Computer Crimes</b>
Definition and types of computer crimes. Distinction between computer crimes and conventional crimes. Reasons for commission of computer crimes. Breaching security and operation of digital systems. Types of computer crimes – computer stalking, pornography, hacking, crimes related to intellectual property rights, computer terrorism, hate speech, private and national security in cyber space. An overview of hacking, spamming, phishing and stalking. Computer virus, and computer worm – Trojan horse, trap door, super zapping, logic bombs.
<b>Module VI: Computer Forensics Investigations</b>
Seizure of suspected computer. Preparation required prior to seizure. Protocol to be taken at the scene. Extraction of information from the hard disk. Treatment of exhibits. Creating bit stream of the original media. Collection and seizure of magnetic media. Legal and privacy issues. Examining forensically sterile media. Restoration of deleted files. Password cracking and E-mail tracking. Encryption and decryption methods. Tracking users.

*25/11/20* *Asla*



## 2.ECONOMIC OFFENCES(IV SEMESTER)

<b>MODULE I: Taxonomy of Economic Offences/Criminogenic Factors</b>
Fundamentals of economics in economic offences. Tax evasion. Excise duty evasion. Fraudulent bankruptcy. White collar crime. Economic exclusion. Black money. Corruption and bribery of public servants. Money laundering and hawala transactions. Insurance frauds. Corporate frauds. Bank frauds. Ponzi scheme. Pyramid scheme. Illicit trafficking in contraband goods. Illicit trafficking in arms. Illicit trafficking in explosives. Illicit drug trafficking. Trafficking in human organs. Cultural objects trafficking. Racketeering in employment. Racketeering in false travel documents.
<b>MODULE II: Applied Economics in Processing Evidence</b>
Forensic accountancy and forensic auditing. Valuation of economic losses. Violation of Intellectual Property Rights.
<b>MODULE III: Prevention of Economic Offences</b>
Legislations to deal with different forms of economic offences. RBI Act. SEBI Act. Competition Commission of India Act. Credit card frauds. Enforcement agencies to deal with different forms of economic offences. International perspectives – measures adopted by FBI and INTERPOL. Case histories of economic offences.

## 3.FORENSIC ODONTOLOGY (VI SEMESTER)

Offered by other streams also.

R.S.P. Apta



Examination Scheme (B.Sc. FORENSIC SCIENCE)

PROPOSED

**Semester- I**

Paper	Subject	Course Code	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
				Univ. Exam	Internal Assessment	Univ. Exam.	Internal Assessment		
1	Crime Society & Police Organization			60	40	-	-	100	4
2	Introduction to Forensic Science			60	40	-	-	100	4
3	Chemistry-I			60	40	30	20	150	4+2
4	Biology-I			60	40	30	20	150	4+2
	Physics I			60	40	30	20	150	4+2
	<b>Total</b>			300	200			650	26
	AECC-1(ENGLISH)			60	40			100	2

**Semester-II**

1	Crime Scene Investigation & Management			60	40	-	-	100	4
2	Forensic Psychology			60	40	-	-	100	4
3	Biology-II			60	40	-	-	100	4
4	Chemistry-II			60	40	-	-	100	4
5	Forensic Psychology Practicum					60	40	100	2
	Biology-II Practicum					30	20	50	2
7	Chemistry-II Practicum					30	20	50	2
8	Mathematics			60	40	-	-	100	2
	<b>Total</b>			300	200	120	80	700	26
9	AECC-2(Computer Sciences)			60	40	-	-	100	2

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### Semester-III

1	Basic Instrumentation			60	40	-	-	100	4
2	Economic Offences			60	40	-	-	100	4
3	Introduction to Questioned Document			60	40	-	-	100	6
4	Biology-III			60	40	30	20	150	6
5	Physics-II			60	40	30	20	150	6
6	Cyber Security			60	40	-	-	100	4
	Total			360	240	120	80	600	20
	AECC-3(EVS)			60	40	-	-	100	4

### Semester -IV

1	Fingerprint & Other Impression			60	40	30	20	150	8
2	Forensic Engineering			60	40	30	20	150	8
3	Digital Forensics & Photography			60	40	-	-	100	6
	Forensic Ballistic			60	40	30	20	150	8
5	Applied Instrumentation			60	40	30	20	150	8
	Total			300	200	200	80	700	38

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*Amrinder Kaur*

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### Semester -V

Pa per	Subject	Course code	Paper Code	Theory Examination		Practical Examination		Total Marks	Credits
				Univ. Exam.	Internal Assessme nt	Univ. Exam.	Internal Assessment		
1	Advanced Forensic Biology			60	40	30	20	150	6
2	Forensic Chemistry-Drugs & Poisons			60	40	30	20	150	6
3	Forensic Physics			60	40	30	20	150	6
4	Anthropology & Personal Identification			60	40	30	20	150	6
5	Quality Management			60	40	-	-	100	4
Total				300	200	120	80	700	28
AEEC-1				60	40	-	-	100	2

### Semester-VI

1	Forensic Serology			60	40	30	20	150	6
2	Forensic Toxicology			60	40	30	20	150	6
3	Forensic Medicine			60	40	30	20	150	6
4	Forensic Odontology			60	40	30	20	150	6
4	Dissertation			-	-	50	50	100	6
Total				240	160	170	100	700	30

*Handley* <sup>3</sup>

*Amrutha Ramesh*

*Dr. S. S. S.*

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B.Sc.(Hons.) Forensic Science

Scheme of Examination

(EXISTED)

Semester I

Paper code	Name of the paper	Max. marks (Theory)	Internal assessment	Total marks	Time (hrs.)
09070101	Physics-I	60	40	100	3
09070102	Chemistry-I	60	40	100	3
09070103	Biology-I	60	40	100	3
09070104	Introduction to forensic science	60	40	100	3
09070105	Crime, society & police organizations	60	40	100	3
09070106	Applied Mathematics	60	40	100	3
09070107	Practical I	60	40	100	

Semester II

Paper code	Name of the paper	Max. marks (Theory)	Internal assessment	Total marks	Time (hrs.)
09070201	Physics-II	60	40	100	3
09070202	Chemistry-II	60	40	100	3
09070203	Biology-II	60	40	100	3
09070204	Crime scene investigation & management	60	40	100	3
09070205	Forensic Psychology	60	40	100	3
09070206	Statistics	60	40	100	3
09070207	Practical II	60	40	100	

Anupama Kaur  
Dandekar

Dr. S. S. S.

Dr. S. S. S.



## Semester III

Paper code	Name of the paper	Max. marks (Theory)	Internal assessment	Total marks	Time (hrs.)
09070301	Physics-III	60	40	100	3
09070302	Chemistry-III	60	40	100	3
09070303	Biology-III	60	40	100	3
09070304	Instrumentation-I	60	40	100	3
09070305	Introduction to Questioned Documents	60	40	100	3
09070306	Personal Identification	60	40	100	3
09070307	Practical III	60	40	100	

## Semester IV

Paper code	Name of the paper	Max. marks (Theory)	Internal assessment	Total marks	Time (hrs.)
09070401	Fingerprints & other impressions	60	40	100	3
09070402	Instrumentation-II	60	40	100	3
09070403	Computer Science	60	40	100	3
09070404	Digital Forensics	60	40	100	3
09070405	Anthropology	60	40	100	3
09070406	Quality Management	60	40	100	3
09070407	Practical IV	60	40	100	

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## Semester V

Paper code	Name of the paper	Max. marks (Theory)	Internal assessment	Total marks	Time (hrs.)
09070501	Basics of Forensic Biology	60	40	100	3
09070502	Basics of Forensic Chemistry	60	40	100	3
09070503	Basics of Forensic Physics	60	40	100	3
09070504	Forensic Engineering	60	40	100	3
09070505	Economic Offences	60	40	100	3
09070506	Practical-V	60	40	100	
09070507	General Seminar			100	1

## Semester VI

Paper code	Name of the paper	Max. marks (Theory)	Internal assessment	Total marks	Time (hrs.)
09070601	Basics of Forensic Serology	60	40	100	3
09070602	Basics of Forensic Toxicology	60	40	100	3
09070603	Basics of Forensic Medicine	60	40	100	3
09070604	Forensic Photography	60	40	100	3
09070605	Forensic Ballistic	60	40	100	3
09070606	Practical-VI	60	40	100	
09070607	Dissertation			100	1

*Ambarish Ranig*  
*Shankar* *Devi* *Vin*



**B.Sc. (Hons.) FORENSIC SCIENCE**  
**FIRST SEMESTER**

**Paper code-**

**Physics-I**

1.	<ul style="list-style-type: none"><li>• Interpretation and applications of Newton's laws of motion - inertial and non-inertial frames, Pseudo forces, conservation of linear momentum, frictional forces, explanation of card seat belt</li><li>• Review of Kinematics, Projectile Motion and Uniform Circular Motion</li><li>• Elastic and Inelastic Collisions, Perfectly Elastic and Perfectly Inelastic Collisions, qualitative understanding of elastic collisions involving cars - inelastic collision of cars at high speed (no permanent deformation) and inelastic collisions at high speed (permanently deformed)</li></ul>
2.	<ul style="list-style-type: none"><li>• Fluid Dynamics - Concept of studying Collective motion of fluid particles, streamlines vs turbulent flow, equation of continuity of incompressible fluid, Bernoulli's equation and applications in spinning of cricket ball and countering gravity in airplane</li><li>• Concept of Viscous Force, Co-efficient of Viscosity, Poiseuille's Equation</li><li>• Elastic properties of matter, elastic constants and their interrelations - longitudinal (normal to surface) and shearing (tangential to surface) stresses, Young's Modulus, Shearing Modulus or Modulus of Rigidity or Torsional Modulus (shearing stress by strain), Bulk Modulus (volume stress by strain)</li></ul>
3.	<p>Sound -</p> <ul style="list-style-type: none"><li>• Concept of Longitudinal Wave, Sound Wave in metallic String vs Air, Review of Amplitude, Frequency, Phase &amp; Intensity of Sound Wave, Wave nature of sound - interference, diffraction</li><li>• Frequency Range of Human Hearing,</li><li>• Musical Sound - Pitch, Timbre and Fourier Synthesis,</li><li>• Basics of Ultrasonography, Production and Applications,</li><li>• Persistence of Hearing, Reflection - Echo and Reverberation</li></ul> <p>Light -</p> <ul style="list-style-type: none"><li>• Concept of Ray and its limitation</li><li>• Wave Nature of Light - transverse wave, interference and diffraction, Young's single and double slit experiments,</li><li>• Concept of Dispersion by Prism and Principle of Prism Spectrometer</li><li>• Basics of Reflection, Refraction and Total Internal Reflection with examples</li></ul>

*Angus Rams*  
*Chandray*

*Isaacs*

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## 1. Paper code- Chemistry-I

### Module I - LIQUID STATE AND SOLUTIONS

- Liquid state: Free volume of liquid and density measurement, physical properties of liquid, vapor pressure, surface tension, surfactants, viscosity, molar refraction, optical activity, structure of liquid
- Solutions: Method of exploring concentration of solutions, binary liquids, vapor pressure, composite diagram of binary liquids and solutions, distillation, fractional distillation, vacuum distillation

### Module II - CHEMICAL THERMODYNAMICS AND CHEMICAL KINETICS

- Chemical thermodynamics and kinetics, first law of thermodynamics, internal energy, enthalpy, second law of thermodynamics, entropy and its significance, free energy and work function
- Rate of reaction, order of molecularity of reaction, slow reaction and fast reaction, first order reaction, half life period of first order reaction, activation energy, temperature dependence of activation energy, explosive reactions, oscillatory reactions

### Module III - INTRODUCTION OF PERIODIC TABLE & PHYSICAL INSTRUMENTS

- Study of Modern Periodic Table, Long form of Periodic Table, periodic properties, atomic radiation, ionization potential, electron affinity, electro negativity, metallic characters, Non-metallic characters and magnetic properties, Comparative study of S and P block elements
- Conductance, Conductometry, Electro Motive Force, Potentiometry

## 2. Paper code- Biology-I

### Module I - CELL BIOLOGY, ORGANIC AND BIOCHEMICAL COMPOUNDS

- Cell theory, Cell Structure and Function in Prokaryotes and Eukaryotes.
- Unicellular and Multicellular organisms
- Composition of blood, study of blood components and its functions and body fluid analysis.
- Properties, Classification and function of carbohydrates, proteins, nucleic acids and lipids

### Module II - PLANT MORPHOLOGY AND ANATOMY

- Principles of Taxonomy and systems of classification of angiosperms (Bentham and Hooker) and Gymnosperms (Chamberlain)
- Mechanical and conducting tissue systems in plants
- Morphology of root, leaf, stem, flowers and their modifications.
- Anatomy of mono and dicot roots, leaves and stems - secondary growth, growth rings, calculation of life of wood

### Module III - HUMAN PHYSIOLOGY AND ANATOMY

- Nutrition - BMR, Calorie value, balanced diet, obesity, digestive system.
- Skeletal Muscle physiology and Nervous system Physiology, coordination systems, brain functions and receptor organs
- Respiratory system physiology - exchange of gases, process of pulmonary respiration
- Mechanism of blood circulation, cardiac mechanism.
- Morphological study of human body parts and regions - Gross and Microscopic, Microbe-Human interaction

*Angus Davis*  
*Alondray*  
*DSyer*  
*V.*



### 3. Paper code-

#### Introduction to Forensic Science

##### Course Contents:

##### Module I: Brief description & History of Forensic Science

Definition, description, principles, concept, needs and scope.

History of Forensic Science and Forensic Science Labs; Progressive development and transformation of Forensic Science Labs.

##### Module II: Forensic Science Laboratories

Main Authority, Organizational structure of Forensic Science Laboratory – roles and responsibilities, Sections/ Divisions, Services Provided. Mobile forensic science laboratory – their distribution in India, functions, need and utility.

##### Module III: Evidence Applicability in Court

Definition, Various types of evidences, the law of evidence, Expert's testimony and admissibility of scientific evidence in court of Law.

### 4. Paper code

#### Crime, Society & Police organizations

##### Course Contents:

##### Module I: Criminology and Criminal Behaviour

Definition: Crime, Criminal and Criminology; Criminology as Science, The field and scope of Criminology; Methods and Techniques in Criminology; Concept of a criminal and classification of criminals.

**Types of Crime:** Organized crime; White – collar crimes/ Occupational crimes; Murders; Crime against women and children.

##### Module II: Juvenile Delinquency & Punishment

Definition, Types of Juvenile Delinquents ; Classification of Juvenile Delinquents; Factors in Juvenile Delinquency, Custody of juvenile delinquents; Juvenile courts procedure; behavior modification techniques; Preventive Programmes. Punishment: Concept of punishment, kinds of punishments, Humanitarian approach to concept of punishment, capital punishment in India, Introduction to criminal Laws(Definition only): IEA, IPC and CrPC.

##### Module III: Police Administration

Role of police in regard to criminals; Police role in the society; Custodial crimes: Complaints against police personnel; Interrogation of suspects and offenders; interviewing the criminals; improving the Police force.

### 5. Paper code

#### Practical-I

*Angus Rainis*  
*Handley*  
*R. S. S. S.*  
*W. C.*



1. Paper code- 05190201

Chemistry-II 2<sup>nd</sup> Semester

Proposed:

**Module I – INTRODUCTION OF ANALYTICAL TECHNIQUES**

- Introduction of Gravimetric analysis and Volumetric analysis
- Chromatographic separation, liquid chromatography (paper, column and TLC)

**Module II – INTRODUCTION OF INORGANIC AND ORGANIC CHEMISTRY**

- Empirical and molecular formulae, hybridization, nature of chemical bonding, polarization, hydrogen bonding, Van der Waals forces, IUPAC nomenclature of alkanes, alkenes, haloalkanes, alcohol, ether, aldehydes, ketones, carboxylic acids, nitro compounds, nitrites including cyclic analogues and also aromatic compounds, naphthalene, anthrones and phenanthrones
- Reactive intermediates and related reactions

**Module III – INTRODUCTION OF CHEMICAL COMPOUNDS**

- Heterocyclic Chemistry: Natural products, Petroleum products, insecticides, pesticides etc.
- Introduction to dyes, Paints, polymers

**Module IV- PHYSICAL CHEMISTRY**

Chemical thermodynamics- Gibbs- Helmholtz's energy efficiency, entropy, work function.

a) Chemical kinetics –rate, order and molecularity of reaction. Energy of activation, molecular activation-collision theory, Specific reaction rate-half life expression.

b) Electro chemistry: Laws of electrochemistry, Electro chemical cell, salt bridge, EMF-set up of cell –calus

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Asta Srinivasan

MB



## 2. Paper code- Biology-II

### Module I – MICROBIOLOGY AND BIOTECHNOLOGY

- Microscopy - Principles and types
- Historical introduction to microbiology
- Basics of Microbiology and concepts of Pure culture techniques.
- Broad classification of microorganisms
- Recombinant DNA technology and its application in Health and Diseases, Western and Southern Blot techniques

### Module II – EVOLUTION AND GENETICS

- Origin of life and Geological time scale
- Theories and evidences of evolution - Darwinism, Lamarckism, fossil record and biochemical evidences.
- Origin and Concept of Species - specification and isolation, geographical and reproductive.
- Genetic Materials - Structural organization and functions
- Mendelian Principles, Mendel's Laws and Ratio
- Sex linked inheritance, sex determination and crossing over - Karyotyping analysis, Chromosomal mapping, DNA and RNA structural types

### Module III – IMMUNOLOGY

- Immunity and Immune System
- Structure and interaction of antigens and antibody
- Virology and Bacteriology - structure, genetics and diseases
- B cell / T cell development, diversity and recognition
- Immunoglobulins structure - transplantation and types, immune system disorders.
- Various types of microbial cultures
- Failures of Body defenses

## 3. Paper code- Crime Scene Investigation & Management

### Course Contents:

#### Module I: Crime Scene & Types

Defining a crime scene, Importance, problem, location and processing of Crime Scene and Crime scene Management. Types: Mobile, Indoor and outdoor crime scenes; various searching techniques used for locating physical evidences at scene of crime.

#### Module II: Recording & reconstructing the Scene of Crime

Barricading of crime scene; Crime Scene Photography; Sketching; Notes making; Handling clues and evidences. Reconstruction of Crime Scene: Procedure and requirements; Guidance from field notes; Modus operandi, role of Investigating Officer.

#### Module III: Physical Evidences

Definition, types of physical evidences, Collection, packaging, preservation and forwarding of physical evidences, Chain of custody.

Amrinder Rains  
Ranjana Singh



#### 4. Paper code-

### Forensic Psychology

#### Course contents:

##### Module I: Basics of Forensic Psychology

Definition and fundamental concepts of forensic psychology and forensic psychiatry. Psychology and law. Ethical issues in forensic psychology.

Assessment of mental competency. Mental disorders and forensic psychology.

Psychology of evidence – eyewitness testimony, confession evidence. Criminal profiling.

Psychology in the courtroom, with special reference to Section 84 IPC.

##### Module II: Psychology and Criminal Behavior

Psychopathology and personality disorder. Psychological assessment and its importance.

Serial murderers. Psychology of terrorism.

Biological factors and crime – social learning theories, psycho-social factors, abuse.

Juvenile delinquency – theories of offending (social cognition, moral reasoning).

Child abuse (physical, sexual, emotional), juvenile sex offenders, legal controversies.

##### Module III: Detection of Deception

Tools for detection of deception – interviews, non-verbal detection, statement analysis, voice stress analyzer (VSA), Hypnosis.

Polygraphy – operational and question formulation techniques, ethical and legal aspects, the guilty knowledge test.

Narco analysis and brain electrical oscillation signature (BEOS) – principle and theory, ethical and legal issues.

#### 5. Paper code-

### Applied Mathematics

#### Course Contents:

##### Module I: Theory of equations

Polynomial Equations with real Coefficients - Irrational roots - Complex roots- Transformation of equation by increasing or decreasing roots by a constant - Reciprocal equations - Newton's method to find a root approximately - Simple problems.

##### Module II: Matrices

Matrices- Definition and types of Matrices, Algebra of Matrices (addition, subtraction, scalar multiplication and multiplication of matrices) Symmetric & skew symmetric matrices

Inverse of a matrix by adjoint method, Rank of a Matrix (Definition) and examples.

System of Linear equation.

i) Non homogeneous

ii) Homogeneous With examples

Eigen values and Eigen vectors with simple examples

##### Module III: Differential calculus

1<sup>st</sup> order Differentiation and its applications: maxima and minima concept, successive differentiation and its uses. Integration and its applications with simple examples

#### 6. Paper code-

### Practical-II

*Angus Rainis*  
*Alauday*  
*Roger*



## THIRD SEMESTER

### 1. Paper code-

#### Physics-II

##### Module I – Basic Spectroscopy:

Introduction, electromagnetic spectrum, sources of radiations, conventional sources for UV, Visible and IR rays, shorter wavelength radiation (X-ray tube),

Interaction of radiation with matter: Reflection, absorption, transmission, fluorescence, phosphorescence.

##### Module II – Analog and Digital Electronics

Generation of various types of waveforms, wave shaping circuits, Active filters, A to D and D to A convertors, Modulation, need of Modulation, Amplitude and Frequency Modulation and its applications, Fourier transforms.

##### Module III – Physics of Speech

Introduction, the generation of sound, amplitude vibration, simple harmonic motion, addition of sine waves, physical properties of vibrating systems, propagation of sound waves, standing waves, modes of vibration.

### 2. Paper code-

#### Biology-III

##### Module I – Ecology

- Terrestrial environments

- Aquatic conditions

- Water Chemistry

- Temperature control

- Chemical cycles

- Food chains

Endangered plants and animal species

##### Module II

*Amrinder Kaur*  
*Shalini*  
*Deep*  
*Vin*



- Analysis of Biological Fluid
- Saliva
- Semen
- Vaginal Fluid
- Urine
- Sweat
- Serological Concepts
- Antigen / Antibodies
- Polyclonal antibodies
- Monoclonal antibodies
- Antiglobulins
- Serological Techniques
- Electrophoretic Methods – Agarose gel, SDS, Native/Denatured
- Identification of Blood
- Properties
- Blood Grouping – Human & Non-human
- Presumptive & Confirmatory Tests
- Human & Animal Hair morphology

### Module III – Genetics

Structural & definitive properties of Chromosomes, Human Genome, Deoxyribose Nucleic Acid – Structural properties, Sources of DNA evidence

- ❖ DNA Extraction- Basic Principles, Methods of DNA extraction
- ❖ DNA Quantification- Slot Blot Assay, Southern /Northern Blotting
- ❖ DNA Amplification by Polymerase Chain Reaction
- ❖ DNA Electrophoresis
- ❖ DNA databasing

### 3. Paper code-

#### Basic Instrumentation

#### Course contents:

#### Module I: Spectroscopic Techniques

Spectroscopic methods. Fundamental principles and forensic applications of Ultraviolet-visible spectroscopy, infrared spectroscopy, atomic absorption spectroscopy, atomic emission spectroscopy and mass spectroscopy. X-ray spectrometry. Colorimetric analysis and Lambert-Beer law.

#### Module II: Chromatographic Techniques

General principles, Type of Chromatography, Paper chromatography, Thin layer chromatography, HPLC, HPTLC : Basic principles, theory, Instrumentation and Applications. Gas chromatography, Gas-liquid chromatography: Basic principles, theory, Instrumentation and Applications

#### Module III: Others

Neutron activation analysis – fundamental principles and forensic applications.  
Nuclear magnetic resonance Spectroscopy  
Thermal analysis

*Ameyunus Rains*  
*Handbay* *ASegh*  
*✓*



**Introduction to Questioned Documents****Course contents:****Module I: Nature and Scope of Questioned Documents**

Definition of questioned documents. Types of questioned documents. Preliminary examination of documents.

Basic tools needed for forensic documents' examination – ultraviolet, visible, infrared and fluorescence spectroscopy, photomicrography, microphotography, visible spectral comparator, electrostatic detection apparatus.

Determining the age and relative age of documents.

**Module II: Comparison of Documents**

Comparison of handwriting. Development of individuality in handwriting. Natural variations and fundamental divergences in handwritings. Class and individual characteristics.

Merits and demerits of exemplar and non-exemplar samples during comparison of handwriting.

Standards for comparison of handwriting.

Comparison of paper, ink, printed documents, typed documents, Xeroxed documents.

**Module III: Forgeries**

Alterations in documents, including erasures, additions, over-writings and obliterations.

Indented and invisible writings. Charred documents.

Examination of counterfeit Indian currency notes, passports, visas and stamp papers.

Disguised writing and anonymous letters.

*Amarendra Rao*

*Arundhati*

*Arundhati*

*Arundhati*



## 5. Cyber Security

### Course contents:

#### Module I:

Computer characteristics and classification, hardware and software.  
Computer languages, flow chart and algorithm.

#### Module II:

Networking and internet concepts, fundamentals of storage devices, file system, concepts of Operating System software, its review and major functions (DOS, UNIX, WINDOWS).  
Networking and its protocol, Fundamentals of Mobile communications

#### Module III:

Details about Windows, Windows accessories and other applications. Data storage and memory allocation, history of operating systems, various operating systems, Modern application softwares.

#### Module IV: Fundamentals and Concepts

Fundamentals of computers Hardware and accessories – development of hard disk, physical construction, CHS and LBA addressing, encoding methods and formats.  
Memory and processor. Methods of storing data. Operating system. Software.  
Introduction to network, LAN, WAN and MAN.

#### Module V: Computer Crimes

Definition and types of computer crimes. Distinction between computer crimes and conventional crimes. Reasons for commission of computer crimes. Breaching security and operation of digital systems.  
Types of computer crimes – computer stalking, pornography, hacking, crimes related to intellectual property rights, computer terrorism, hate speech, private and national security in cyber space.  
An overview of hacking, spamming, phishing and stalking.  
Computer virus, and computer worm – Trojan horse, trap door, super zapping, logic bombs.

#### Module VI: Computer Forensics Investigations

Seizure of suspected computer. Preparation required prior to seizure.  
Protocol to be taken at the scene. Extraction of information from the hard disk.  
Treatment of exhibits. Creating bit stream of the original media. Collection and seizure of magnetic media. Legal and privacy issues. Examining forensically sterile media. Restoration of deleted files.  
Password cracking and E-mail tracking. Encryption and decryption methods. Tracking users.

*Anupam Raiis*

*Shankar*

*Pragati*

*Vin*



#### 4. Economic Offences

##### **MODULE I: Taxonomy of Economic Offences/Criminogenic Factors**

Fundamentals of economics in economic offences.

Tax evasion. Excise duty evasion. Fraudulent bankruptcy. White collar crime. Economic exclusion. Black money. Corruption and bribery of public servants. Money laundering and hawala transactions.

Insurance frauds. Corporate frauds. Bank frauds. Ponzi scheme. Pyramid scheme.

Illicit trafficking in contraband goods. Illicit trafficking in arms. Illicit trafficking in explosives.

Illicit drug trafficking. Trafficking in human organs. Cultural objects trafficking.

Racketeering in employment. Racketeering in false travel documents.

##### **MODULE II: Applied Economics in Processing Evidence**

Forensic accountancy and forensic auditing.

Valuation of economic losses. Violation of Intellectual Property Rights.

##### **MODULE III: Prevention of Economic Offences**

Legislations to deal with different forms of economic offences. RBI Act. SEBI Act. Competition Commission of India Act.

Credit card frauds.

Enforcement agencies to deal with different forms of economic offences.

International perspectives – measures adopted by FBI and INTERPOL. Case histories of economic offences.

#### 5. Paper code-

Practical-III

*Amrinder Kaur*  
*R Singh*  
*Abdullah*  
*Vin*



## 1. Paper code-

**Fingerprints & Other Impressions****Course contents:****Module I: Basics of Fingerprinting**

Introduction and history, with special reference to India.  
 Biological basis of fingerprints. Formation of ridges. Fundamental principles of fingerprinting. Types of fingerprints. Fingerprint patterns. Fingerprint characters/minutiae. Plain and rolled fingerprints. Classification and cataloguing of fingerprint record. Automated Fingerprint Identification System. Significance of poroscopy and edgeoscopy.

**Module II: Development of Fingerprints**

Latent prints. Constituents of sweat residue.  
 Latent fingerprints' detection by physical and chemical techniques.  
 Mechanism of detection of fingerprints by different developing reagents.  
 Application of light sources in fingerprint detection.  
 Preservation of developed fingerprints.  
 Digital imaging for fingerprint enhancement.  
 Fingerprinting the deceased. Developing fingerprints on gloves.

**Module III: Other Impressions**

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

2. Paper code- **Applied Instrumentation****Course Contents:****Module I: Microscopy**

Fundamental principles. Different types of microscopes. Electron microscope. Comparison Microscope. Stereozoom microscope, Forensic applications of microscopy.

**Module II: Centrifugation Techniques**

Basic principles of sedimentation, various types of centrifuges, Density gradient centrifugation Preparative centrifugation, Analysis of sub-cellular fractions, Ultracentrifuge- Refrigerated Centrifuges

**Module III: Immuno-chemical & Electrophoretic Techniques**

Gel immuno-diffusion, Immuno-electrophoresis, Radio Immuno Assay (RIA), ELISA, Fluorescence immuno assay. 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

*Amrinder Kaur*  
*Shalini* *Dege*



## Forensic Engineering

### MODULE I: Forensic Engineering

Introduction to Forensic Engineering; Fire investigation; Industrial accidents; Traffic accident reconstruction; Transportation disaster investigation; Civil engineering investigation; Investigation report.

Structural failures, static loads, dynamic loads, causes of building collapse

### MODULE II:

Role of mechanical, electronics and computer engineers in forensic science. Accident investigations. Failure of signaling and control systems. Ergonomics. Applications of animations, simulations and digital imaging in solving crime cases. Episodes involving fire engineering.

### MODULE III:

Building and other Materials - Types of cement and their composition, Determination of adulterants, Analysis of Bitumen and road material, Analysis of cement mortar and cement concrete and stones. Forensic examination of electrical appliances, strings/ropes, threads. Wires/cables, Seals

### 4. Paper code-

#### Practical-IV

*Amir Kaur*  
*Shubh*  
*Vu*



## 1. Paper code-

## Advanced Forensic Biology

## Course contents:

**Module I: Biological Evidence**

Nature and importance of biological evidence.  
 Significance of hair evidence. Transfer, persistence and recovery of hair evidence. Structure of human hair. Comparison of hair samples. Morphology and biochemistry of human hair. Comparison of human and animal hair.  
 Types and identification of microbial of forensic significance.  
 Identification of wood, leaves, pollens and juices as botanical evidence. Diatoms and their forensic significance.

**Module II: Wildlife Forensics**

Fundamentals of wildlife forensic. Significance of wildlife forensic. Protected and endangered species of animals and plants. Illegal trading in wildlife items, such as skin, fur, bone, horn, teeth, flowers and plants. Identification of physical evidence pertaining to wildlife forensics. Identification of pug marks of various animals.

**Module III: Forensic Entomology**

Basics of forensic entomology. Insects of forensic importance. Collection of entomological evidence during death investigations.

## 2. Paper code-

## Forensic Chemistry-Drugs &amp; Poisons

## Course Contents:

**Module-I: Qualitative & Quantitative analysis**

Organic - inorganic products, oils, petroleum products, cement & concrete materials

**Module-II:**

Screening, sampling-methods type (collection), statistical methods, different standard methods  
 b) Inorganic analysis.  
 c) Micro-chemical method

**Module-III: Miscellaneous**

Characteristics/examination/act/organic-inorganic products  
 -Gold, silver, tobacco, tea, sugar, salts, fertilizers, dyes, drugs, poisons, fats  
 -various acts (legal aspects)

Amrinder Kaur

Shweta

Shweta

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### 3. Paper code-

#### Forensic Physics

##### Course Contents:

##### Module I: The Metric System-

Introduction to the metric system , Physical properties of physical evidences like soil, glass, fiber, hair and liquids

##### Module II: Glass, Soil and Paint Examination

Glass: Composition, Comparing glass fragments, glass fractures.

Examination of soil, Color, density, size distribution of soil particles, mineral analysis and chemical analysis of soil, collection of preservations of soil.

paint chemistry, forensic examination of household paints and automobile paints.

##### Module III: Forensic Examination of Fibers

Classification of fibers, preliminary examination, properties of fiber, microscopic and chemical examination.

### 4. Paper code-

#### Quality Management

##### Course Contents:

##### MODULE I: Management requirements

General requirements for the competence of testing and calibration laboratories – Introduction, Scope Management requirements: Organization, Quality System, Document Control, Review of requests

Internal Audits; Control of records, Corrective and preventive actions, Tenders and contracts, Subcontracting of tests and calibration, Purchasing services and supplies, Service to the clients, Complaints.

##### MODULE II: Technical requirements

Technical requirements: General, Personnel, Accommodation and environmental conditions, Test and calibration methods, Equipment, measurement traceability, Sampling, Handling of test and calibration items, assuring the quality of test and calibration results and reporting the results.

##### MODULE III: Laboratory Management

Laboratory information management system, validation and safety equipments

*Amrinder Kaur*  
*Shalini*  
*Dr. S. S. S.*  
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## 5. Paper Code

### Anthropology & Personal Identification

#### MODULE I- Significance of Forensic Anthropology

Scope of forensic anthropology. Study of human skeleton. Nature, formation, and identification of human bones. Determination of age, sex, stature from skeletal material.

#### MODULE II- Personal Identification – Somatoscopy and Somatometry

Somatoscopy – observation of hair on head, forehead, eyes, root of nose, nasal bridge, nasal tip, chin, Darwin's tubercle, ear lobes, supra-orbital ridges, physiognomic ear breadth, circumference of head. Scar marks and occupational marks.

Somatometry – measurements of head, face, nose, cheek, ear, hand and foot, body weight, height.

Indices - cephalic index, nasal index, cranial index, upper facial index.

#### MODULE III- Facial Reconstruction

Portrait Parle/ Bertillon system, Photofit/identi kit. Facial superimposition techniques.

Cranio facial super imposition techniques – photographic super imposition, videosuperimposition, Roentgenographic superimposition. Use of somatoscopic and craniometric methods in reconstruction. Importance of tissue depth in facial reconstruction.

Genetic and congenital anomalies – causes, types, identification and their forensic significance.

## 6. Paper code-

Practical-V

Anupama Kaur

Chandray

Singh

Vic



## 1. Paper code- Forensic Serology

### Course Contents:

#### Module I: Blood and its Forensic analysis

The nature of blood, collection, preservation and packing of blood evidence, procedures and precautions. Identification of bloodstains by microscopic methods, Catalytic tests, crystal tests, Spectrophotometric method, chromatographic and immunological methods. Electrophoresis methods

#### Module II: Species of Origin & Grouping of Bloodstains

Determination of species of origin. Ring test, Immunoelectrophoresis, single diffusion, double diffusion, Crossed-Over electrophoresis, ABO system, Rh system and MN system. Techniques for the determination of blood groups.

#### Module III: Introduction & Forensic Analysis of Body Fluids

Introduction to various body fluids, their nature and characteristics  
Forensic analysis of Semen, Saliva, Urine, Sweat, Milk etc.

## 2. Paper code- Forensic Toxicology

### Course Contents:

#### Module I: Metallic Poisons

Arsenic, Mercury. Nature, administration, symptoms, postmortem findings, Detection and medico-legal aspects.

#### Corrosive Poisons

Acids: HCl,  $H_2SO_4$ ,  $HNO_3$

Corrosive poisons-2: Alkalies; NaOH, KOH

#### Barbiturates

Classification, administration, symptoms, postmortem findings, detection and medico-legal aspects.

#### Module II: Volatile Poisons

Methyl alcohol, Chloroform. Nature, administration, symptoms, post-mortem findings, isolation, detection and estimation, medico-legal findings.

#### Module III: Miscellaneous Poisons:

##### Insecticides

Organophosphorous compounds, Organo-chloro compounds and Carbamates- Nature, administration, symptoms, post-mortem findings, isolation, detection, estimation and medico-legal findings.

**Animal poisons:** Snake, Vegetable Poisons: Opium, Cannabis, Dhatura, Oleander, Abrus precatorious, etc. Nature, administration, symptoms, post-mortem findings, isolation, detection and estimation, medico-legal findings.

## 3. Paper code- Forensic Medicine

### Course Contents:

#### Module I: Introduction to wounds

Introduction to wounds; definition, Mechanism of wound production & healing, Determining the age of the injury and its medico - legal aspects

#### Module II: Injuries due to Blunt forces

Abrasions, Bruises, Lacerations; causes, dimensions, ante - mortem & post - mortem injuries and its medico - legal aspects

#### Injuries due to Sharp forces

Incised, Stab, Punctured wounds - causes, dimensions, ante - mortem & post - mortem injuries

#### Module III: Miscellaneous injuries

Injuries due to heat, cold, chemicals and radiation and their medicolegal significance.

#### Firearm Injuries

Injuries caused due to shot-gun, rifle, handguns, post-mortem & anti-mortem firearm injuries

*Amrinder Kaur*  
*Chandray* *Dr. S. S. S.*