

Rayat Shikshan Sanstha's
Yashwantrao Chavan Institute of Science, Satara

SYLLABUS
OF
B.Sc. FIRST YEAR
FORENSIC SCIENCE (ENTIRE)
SEMESTER SYSTEM

Effective from Academic Year

2018-2019

Semester - I

Year	Semester	Paper No.	Title of Paper
First	I	BFSE--101 T	Fundamental of Forensic Science I
		BFSE--102 T	Criminal Law I
		BFSE--103 T	Fundamental of Chemistry I
		BFSE--104 T	Fundamental of Physics I
		BFSE--105 T	Fundamental of Biology I
		BFSE--106 T	Fundamental of Psychology I
		BFSE--107 T	Fundamental of Digital and Cyber Forensics I
		BFSE--108 T	Fundamental of Accountancy I
		BFSE--109 T	English
		BFSE--110 P	Fundamental of Forensic Science And Fundamental of Criminal Law I
		BFSE--111 P	Fundamental of physics And Fundamental of Chemistry I
		BFSE--112 P	Fundamental of Biology And Fundamental of Psychology I
		BFSE--113 P	Fundamental of Digital and Cyber Forensics And Fundamental of Accountancy I
	II	BFSE--201 T	Criminology II
		BFSE--202 T	Criminal Law II
		BFSE--203 T	Fundamental of Chemistry II
		BFSE--204 T	Fundamental of Physics II
		BFSE--205 T	Fundamental of Biology II
		BFSE--206 T	Fundamental of Psychology II
		BFSE--207 T	Fundamental of Digital and Cyber Forensics II
		BFSE--208 T	Fundamental of Statistics II
		BFSE--209 T	English
		BFSE--210 P	Fundamental of Forensic Science And Fundamental of Criminal Law II
BFSE--211 P	Fundamental of physics And Fundamental of Chemistry II		
BFSE--212 P	Fundamental of Biology And Fundamental of Psychology II		
BFSE--213 P	Fundamental of Digital and Cyber Forensics And Fundamental of Accountancy II		

Semester – I

Paper Code	Title of the Paper	Period/ Week	Examination Marks			
			Mid Test	Online Test	Theory	Total
BFSE--101 T	Fundamental of Forensic Science I	3	05	05	30	40
BFSE--102 T	Criminal Law I	3	05	05	30	40
BFSE--103 T	Fundamental of Chemistry I	3	05	05	30	40
BFSE--104 T	Fundamental of Physics I	3	05	05	30	40
BFSE--105 T	Fundamental of Biology I	3	05	05	30	40
BFSE--106 T	Fundamental of Psychology I	3	05	05	30	40
BFSE--107 T	Fundamental of Digital and Cyber Forensics I	3	05	05	30	40
BFSE--108 T	Fundamental of Accountancy I	3	05	05	30	40
BFSE--109 T	English	3	05	05	30	40

Lab Course

Sr. No.	Paper Code	Title of the Paper	Exam	Journal	Case study/ Seminar/ Tour/ Home Assign	Punctuality
1	BFSE--110 P	Fundamental of Forensic Science And Fundamental of Criminal Law I	30	5	5	5
2	BFSE--111 P	Fundamental of physics And Fundamental of Chemistry I	30	5	5	5
3	BFSE--112 P	Fundamental of Biology And Fundamental of Psychology I	30	5	5	5
4	BFSE--113 P	Fundamental of Digital and Cyber Forensics And Fundamental of Accountancy I	30	5	5	5

Semester – II

Paper Code	Title of the Paper	Period / Week	Examination Marks			
			Mid Test	Online Test	Theory	Total
BFSE--201 T	Criminology II	3	05	05	30	40
BFSE--202 T	Criminal Law II	3	05	05	30	40
BFSE--203 T	Fundamental of Chemistry II	3	05	05	30	40
BFSE--204 T	Fundamental of Physics II	3	05	05	30	40
BFSE--205 T	Fundamental of Biology II	3	05	05	30	40
BFSE--206 T	Fundamental of Psychology II	3	05	05	30	40
BFSE--207 T	Fundamental of Digital and Cyber Forensics II	3	05	05	30	40
BFSE--208 T	Fundamental of Statistics II	3	05	05	30	40
BFSE--209 T	English	3	05	05	30	40

Lab Course

Paper Code	Title of the Paper	Exam	Journal	Case study/ Seminar/ Tour/Home Assign	Punctuality
BFSE--210 P	Criminology II And Fundamental of Criminal Law II	30	5	5	5
BFSE--211 P	Fundamental of physics And Fundamental of Chemistry II	30	5	5	5
BFSE--212 P	Fundamental of Biology And Fundamental of Psychology II	30	5	5	5
BFSE--213 P	Fundamental of Digital and Cyber Forensics And Fundamental of Statistics	30	5	5	5

- Theory & Practical lectures of 48 minutes each
- Total marks for B.Sc. Part -I including English =1100
- Total credits for B.Sc. Part I Semester I & II =52
- AECC- Ability Enhancement Compulsory Course (1A & 1B)-English

Objectives of the Course

The Universal Declaration of Human Rights directs the member nations to create such conditions under which the ideals of free human beings, enjoying civil and political freedom from fear and want, can be achieved. The Constitution of India, through its various articles, strives to ensure security and safety of citizens in accordance with the principles of Universal Declaration of Human Rights. However, crime is a violation of these principles. In a country like India, where majority of population is uneducated, social set up is heterogeneous, public-police relations are not very cordial, poverty is rampant and unemployment widespread, it is not surprising that crime rate is increasing exponentially.

If we have to create conditions conducive to harmonious development, we must mitigate the crime rate. This can best be achieved by relying on the support of forensic science system. Unfortunately, in our country, forensic science is not viewed as a core investigative skill in crime detection. In fact, there is a lack of understanding of the forensic process itself. It is for this reason that less than 10% of the police cases are, at present, being referred for forensic examination. Less than 5% are solved by the application of forensic science. The rest are solved by third degree method – a practice which the human rights organizations will not allow in days to come.

In majority of serious crime cases, hi-tech measures are being adopted by perpetrators of crime. The counter measures have to be more sophisticated to surpass them. This calls for strengthening the foundations of forensic science at national level. It is with this aim that we wish to initiate a B.Sc. (Hons) Course in Forensic Science.

The following are the objectives of this course.

1. To emphasize the importance of scientific methods in crime detection.
2. To disseminate information on the advancements in the field of forensic science.
3. To highlight the importance of forensic science for perseverance of the society.
4. To review the steps necessary for achieving highest excellence in forensic science.
5. To generate talented human resource, commensurating with latest requirements of forensic science.
6. To provide a platform for students and forensic scientists to exchange views, chalk-out collaborative programs and work in a holistic manner for the advancement of forensic science.

Eligibility

* Passed Class XII from a recognized Board in science stream.

* The admission will be done on merit basis taking into consideration the aggregate marks obtained in the following three subjects:

(i) Physics

(ii) Chemistry

(iii) Any one out of Mathematics or Biology in whichever subject the candidate has scored higher marks.

FIRST YEAR (SEMESTER-I)
BFSE-101 Fundamental of Forensic Science I

Learning Objectives:

After studying this paper the students will know –

- a. The significance of forensic science to human society.
- b. The fundamental principles and functions of forensic science.
- c. The divisions in a forensic science laboratory.
- d. The **working of the** forensic establishments in India and abroad.

Credits: 2

	Syllabus	Lectures
Unit –I	<p>History of Development of Forensic Science in India Historical aspect's of forensic science, Definitions and concepts in forensic science, Pioneers of forensic science, Basic principles and branches of forensic science, Function's of forensic science, Need of forensic science Frye case and Daubert standard, Scope of forensic science.</p>	09
Unit-II	<p>Divisions of Forensic Science Laboratories. Introduction Forensic Science ,Physics division, Chemistry division, Biology division, Serology division, Ballistics division, Toxicology division, Questioned document division, Fingerprint division, Photography division, Evidence collection division, Prohibition division, Digital and Cyber Division etc.</p>	09
Unit-III	<p>Crime Scene And Physical Evidence Crime Scene Processing, Chain of Custody, Common type of Physical evidence, Significance of Physical evidence, Collection and Packaging of Physical evidence.</p>	09
Unit-IV	<p>Forensic Science in India and International Perspective of Forensic Science DFSS, CFSL, SFSL, RFSL, Mobile Crime Laboratories, Government Examiners of Questioned Documents, Central And Divisional Fingerprint Bureaus, National Crime Records Bureau, Police & Detective Training Schools, Bureau of Police Research & Development, police Academies, Police dogs. Forensic science in international perspectives, set up of :- INTERPOL , FBI, CIA, CSI, Ameripol, Europol, Frontex , Duties of forensic scientists, Code of conduct for forensic scientists, Qualifications of forensic scientists, Data depiction, Report writing.</p>	09

Learning Outcomes:

Unit I

- *Student will learn the origin of forensic science its basic principles and functions .*

Unit II

- *Students will understand the different divisions of Forensic Science.*
- *Students will understand the function and structure of Forensic science laboratories and its set up.*

Unit III

- *Students will understand the crime scene processing.*
- *Students will understand different type of Physical Evidence*

Unit IV

- *Students will understand National and international perspective of Forensic Science.*

Suggested Readings :

1. B.B. Nanda and R.K. Tiwari, *Forensic Science in India: A Vision for the Twenty First Century*, Select Publishers, New Delhi (2001).
2. M.K. Bhasin and S. Nath, *Role of Forensic Science in the New Millennium*, University of Delhi, Delhi (2002).
3. S.H. James and J.J. Nordby, *Forensic Science: An Introduction to Scientific and Investigative Techniques*, 2nd Edition, CRC Press, Boca Raton (2005).
4. W.G. Eckert and R.K. Wright in *Introduction to Forensic Sciences*, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997).
5. R. Saferstein, *Criminalistics*, 8th Edition, Prentice Hall, New Jersey (2004).
6. W.J. Tilstone, M.L. Hastrup and C. Hald, *Fisher's Techniques of Crime Scene Investigation*, CRC Press, Boca Raton (2013).

BFSC102: Criminal Law I

Learning Objectives

- *After studying this paper the students will know –*
- *Elements of Criminal Procedure Code related to forensic science.*
- *Acts and provisions of the Constitution of India related to forensic science.*
- *Acts governing socio-economic crimes.*
- *Acts governing environmental crimes.*

Credits: 2

	Syllabus	Lectures
Unit 1	Introduction to law Classification – civil, criminal cases. Essential elements of criminal law. Hierarchy of criminal courts. Classification of offences. Constitution of India - Preamble, Fundamental Rights, Directive Principles of State Policy. – Articles 14, 15, 20, 21, 22, 51A	09
Unit 2	Substantive and Procedural law section - I Introduction to Criminal Procedure Code. Indian Penal Code pertaining to offences against persons –Sections 121A, 299, 300, 302, 304A, 304B, 307, 309, 319, 320, 324, 326, 351, 354, 359, 362. Sections 375 & 377 and their amendments.	09
Unit 3	Substantive and Procedural law section - II Indian Penal Code pertaining to offences against property Sections – 378, 383, 390, 391, 405, 415, 420, 441, 463, 489A, 497, 499, 503, 511.	09
Unit 4	Substantive and Procedural law section - III Indian Evidence Act – Evidence and rules of relevancy in brief. Expert witness. Cross examination and re-examination of witnesses. Sections 32, 45, 46, 47, 57, 58, 60, 73, 135, 136, 137, 138, 141 of IEA. Section 293 in the code of criminal procedure.	09

Learning Outcomes:

Unit-I

- 1) *Students should be able to understand hierarchy of courts*
- 2) *Students should be able to understand different types of offences*

Unit-II

- 1) *Students should be able to understand procedures of court trials.*

Unit-III

- 1) *Students should be able to understand about Fundamental Rights in Constitution of India*

Unit- IV

- 1) *Students should be able to define Drugs, Psychotropic substances.*
- 2) *Students should be able to understand essential commodity act*
- 3) *Students should be able to explain several aspects of arms and explosive act*

Suggested Readings

1. D.A. Bronstein, *Law for the Expert Witness*, CRC Press, Boca Raton (1999).
2. Vipa P. Sarthi, *Law of Evidence*, 6th Edition, Eastern Book Co., Lucknow (2006).
3. A.S. Pillia, *Criminal Law*, 6th Edition, N.M. Tripathi Pvt Ltd., Mumbai (1983).
4. R.C. Nigam, *Law of Crimes in India*, Volume I, Asia Publishing House, New Delhi (1965).
5. (Chief Justice) M. Monir, *Law of Evidence*, 6th Edition, Universal Law Publishing Co. Pvt. Ltd., New Delhi (2002).

BFSC 103: Fundamental of Chemistry I

Learning Objective :

After studying this paper students we know.....

1. To study of IUPAC Nomenclature and their examples.
2. To Study of Natural Products.
3. Instrumentation of chromatographic technique.
4. Introduction of drugs, dyes, polymer, insecticides, pesticides

Credit : 2

	Syllabus	Lecture
Unit 1	Reactive Intermediate and related reaction Fundamental of chemistry, Reactive Intermediate and related reaction Carbocation Carbanion, Free radical, Carbene, Nitrene, Benzyne , Normality, Morality	09
Unit 2	IUPAC Nomenclature and Introduction of Natural products Alkanes, alkenes, alkynes, haloalkanes, alcohol, ether, aldehyde, ketone, Carboxylic acid, nitro group. Introduction of Natural products : Carbohydrates, Amino acids.	09
Unit 3	Introduction to Chemical compounds Introduction of Petroleum Products, Dyes, Drugs, Paints, Polymer, Insecticides, Pesticides.	09
Unit 4	Chromatography Paper Chromatography, Thin layer chromatography, Column chromatography, High performance liquid chromatography, HPTLC, Gas chromatography, Ion exchange chromatography.	09

Learning outcomes:

Unit 1

- 1. Students will know definition of reactive intermediate.*
- 2. Students will understand the all reactive intermediate and their all reactions in organic chemistry.*

Unit II

- 1. Students will be able to know the IUPAC nomenclature and their various examples.*
- 2. Students will understand the what is meant by natural products i.e carbohydrates and amino acids*

Unit III

- 1. Students will be able to know the introduction to all chemical compounds.*
- 2. and identifying their a chemical compounds.*

Unit IV

- 1. Students will be able to know the all chromatographic methods.*
- 2. and their Principle, instrumentation, working and their advantages and applications.*

Suggested Readings :

1. Analytical Chemistry by G.D. Christian 6th edition.
2. S.B. Karch , The Pathology of Drug Abuse, CRC Press, Boca Raton (1996).
3. Organic Chemistry by Moris and Boyed
4. Heterocyclic chemistry by Gupta kumar Vol I and Vol II
5. Natural Products by S.V. Bhat
6. Instrumental Analysis by Skoog, Holler and Crouch

BFSE- 104
Fundamental of Physics I

Credits: 2

Learning Objectives:

After studying this unit the students will know -

- a. To study the viscosity of liquids.*
- b. To study the Archimedes' Principle, Pressure difference and Buoyant Force in accelerating fluids and different types of fluids.*
- c. To study the basic concept of Optics.*
- d. To study the different types of microscopes and Forensic application of microscopy.*

	Syllabus	Lecture
Unit 1	Fluids and Viscosity Fluids, Friction in Solid surfaces in contact verses friction in Fluid, Pressure in a fluid, Definition of buoyancy, Pascal's law, Atmospheric Pressure and Barometer.	09
Unit 2	Fluid Mechanics Archimedes' Principle, Pressure difference and Buoyant Force in accelerating fluids, Steady and Turbulent Flow, Equation of continuity, Bernoulli's Principle, Application of Bernoulli's equation .	09
Unit 3	Optics Introduction to development of optics, Types of Lens, Lens maker's formula, Cardinal points of an optical system, Aberration, Types of Aberration: Monochromatic, chromatic, Interference in thin film- Thin films, Interference due to transmitted light, Newton's rings.	09
Unit 4	Microscopy Fundamental principles, Different types of microscope, Simple microscope, Electron microscope- Scanning Electron Microscope, Transmission Electron Microscope, Comparison microscope, Binocular microscope, Stereo microscope, Phase contrast microscope, Dark field microscope, Fluorescence microscope, Forensic application of microscopy.	09

Learning Outcomes:

Unit -I

- *Students understand the behavior and properties of fluids.*
- *Students get the knowledge about viscosity of liquids.*

Unit -II

- *The course on fluid mechanics is devised to introduce fundamental aspects of fluid flow behaviour.*
- *A student is able to: State Bernoulli's principle.*
- *To understand basic concept of fluid flow and its application to chemical process industries including pipe flow.*

Unit-III

- *Students will able to know different types of lens, Lens Equation.*
- *Students will able to know different types of aberration*

Unit-IV

- *Investigate different types of microscopes.*
- *Learn how image is formed in a compound microscope.*
- *The significance of microscopy in visualizing trace evidence and comparing it with control samples.*

Suggested Readings:

1. Symon, Keith (1971). Mechanics (Third ed.). Addison-Wesley. ISBN 0-201-07392-7.
2. Viscosity of liquids and gases (<http://hyperphysics.phy-astr.gsu.edu/Hbase/tables/viscosity.html>)
3. University Physics, Sears and Zeemansky XIth edition, Pearson education.
4. Concepts of Physics H.C. Varma Bharati Bhavan Publishers
5. Problems in Physics P.K. Srivastava Wiley Eastern Ltd.
6. Applied Fluid Mechanics, Mott Robert Pearson Benjamin Cummir, VI Edition, Pearson Education/Prentice Hall International, New Delhi
7. Properties of Matter, D. S. Mathur, Shamlal Chritable Trust New Delhi
8. Concept of Physics H.C. Verma Bharati Bhavan Published.
9. [http://en.wikipedia.org/wiki/History of Physics](http://en.wikipedia.org/wiki/History_of_Physics)
10. [http://en.wikipedia.org/wiki/Nobel Prizes in Physics](http://en.wikipedia.org/wiki/Nobel_Prizes_in_Physics)
11. Solid State Physics P. K. Palanisamy, Scitech Publications (India) Pvt. Ltd

BFSC 105 Fundamental of Biology I

Learning Objectives:

After studying this paper the students will know –

- a. The importance of Human Physiology .
- b. The basic principle of human anatomy.
- c. The basic knowledge of genetics.
- d. The basic principle of anatomy.
- e. To study the human anatomy and physiology to solve the forensic cases.
- f. The significance of cell cytology.

Credit: 2

	Syllabus	Lecture
Unit 1	Cytology The Cell and Cell Division: Mechanism of Cell cycle. Meosis & Mitosis - Stages and significance, Apoptosis.	09
Unit 2	Human anatomy Respiratory system: physiology , exchange of gases. Mechanism of blood circulation: cardiac mechanism. Human excretary system: physiology, mechanism & functions of kidney Human Reproductive system: physiology, mechanism & functions	09
Unit 3	Human Physiology Study of blood components and body fluids: Composition & functions of blood, types of blood cells,introduction with different body fluids Nutrition - BMR, Calorie value, balanced diet Digestive system: physiology, structure and mechanism of digestion, enzymes involved in digestion Skeletal Muscle: physiology, structure, mechanism of contraction & relaxation	09
Unit 4	Genetics: Mendelian Principles a) Principle of unit characters b) Principle of dominance (Monohybrid cross) c) Principle of segregation (Monohybrid cross) d) Principle of independent assortment (Dihybrid cross) Sex linked inheritance, sex determination and crossing over, Karyotyping analysis	09

Learning Outcomes:

Unit –I

- *Students will be able to know the cell division and significance of cell Cytology.*
- *Students will be able to know describe the chromosomal basis of inheritance and how alterations in chromosome number or structure may arise during mitosis and meiosis*

Unit -II

- *Students will be able to know the digestive and respiratory system*
- *Students will understand the mechanism of blood circulation.*

Unit –III

- Students will be able to know the blood components and body fluids.*
- Students will be able to know the importance of Human Physiology*

.Unit-IV

- *Students will be demonstrate knowledge of the basics of Mendelian principle and law of segregation.*
- *Students will have to describe how a punnet square can be used to predict the results of a genetic cross*

Suggested Reading

1. Biochemistry-Stryer
2. Biochemistry-U Satynarayanan
3. Principle of Biochemistry by Lehninger.
4. Clinical Biochemistry-Praful B. Godkar
5. Atlas of Human anatomy profectio edition author Frank H. netter
- 6 Cell biology ,genetics, Molecular biology, evolution and ecology-by S chand (1 sep.2004)
7. Ross and Wilson anatomy and Physiology in health and illness-Elsevier publisher(1 Jun 2010)
8. Molecular Biology of cells –B. Alberts, J. Lewis, and J. D. Watson.

BFSC106 - Fundamentals of Psychology

Learning Objectives:

- *After studying this paper the students will know –*
- *The overview of psychology and its applications.*
- *The legal aspects of forensic psychology.*
- *The significance of criminal profiling.*
- *The importance of psychological assessment in gauging criminal behavior.*
- *The tools and techniques required for detection of deception.*
- *The critical assessment of advanced forensic techniques like polygraph, narco analysis and brain electrical oscillation signatures.*

Credit :2

	Syllabus	Lecture
Unit 1	Introduction to Psychology Introduction, Definition, Fields of Psychology, Methods in Psychology. Physiological basis of Human Behavior: Neurons-Structure, Function, Types of Neuron. Nervous System-CNS,PNS, Endocrine system,	09
Unit 2	Theories of Learning Learning: Definition, Nature, Characteristics. Theories of Learning-Pavlov's Theory, Skinner's Theory, Tolman's Theory, Koehler's' Theory. Determinants of Learning. Memory: Basic Process of Memory, Types of Memory, Theories of Forgetting, Causes of forgetting. Introduction to Personality.	09
Unit 3	Psychology and Criminal Behavior Psychopathology and personality disorders. Psychological assessment and its importance. Serial murderers, Psychology of terrorism	09
Unit 4	Biological factors and Crime 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.	09

Learning Outcomes:

Unit -I

- *Students will able understand Psychology.*
- *Students will able to know the nervous system and its function*

Unit -II

- Students will understand the theories of learning..
- Students will able to understand types of Memory
- Students will able to understand personality
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Unit -III

- Students will able to know the Psychological assessments

Unit-IV

- Students will able to know the biological factors regarding social learning theories.
- Students will able to know the psychosocial factors

Suggested Readings

1. A.A. Moenssens, J. Starrs, C.E. Henderson and F.E. Inbau, *Scientific Evidence in Civil and Criminal Cases*, 4th Edition, The Foundation Press, Inc., New York (1995).
2. R. Saferstein, *Criminalistics*, 8th Edition, Prentice Hall, New Jersey (2004).
3. J.C. DeLadurantey and D.R. Sullivan, *Criminal Investigation Standards*, Harper & Row, New York (1980).
4. J. Niehaus, *Investigative Forensic Hypnosis*, CRC Press, Boca Raton (1999).
5. E. Elaad in *Encyclopedia of Forensic Science, Volume 2*, J.A. Siegel, P.J. Saukko and G.C. Knupfer (Eds.), Academic Press, London (2000).

BFSE-107

Fundamental of Digital And Cyber Forensic

Learning Objectives:

After studying this paper the students will know –

- a. The basics fundamental of computers.*
- b. The basics of operating system, networking, file system.*
- c. The types of digital crimes and vulnerabilities.*
- d. The elements involved in investigation of digital crimes.*

Credit - 2

	Syllabus	Lecture
Unit 1	Fundamentals of computers Basics of Computers: Computer organization, Input and Output devices, Central Processing Unit, types of Memory – RAM, ROM etc. Understanding working of internal and external Storage devices. Memory units, memory structure and management.	09
Unit 2	Introduction To Software's, Hardware's And Logic Gates Software and hardware, understanding applications, data representations, integers, real, binary, octal, hexadecimal & their conversions. Logic gates – Negation, OR, AND, XOR etc.	09
Unit 3	Basics of Operating system Introduction to operating System, process management, Concurrency, scheduling, Synchronization, Examples of operating Systems – Windows and Dos, Linux.	09
Unit 4	Types of Computers Internal and external parts of computers ex :- connectors, sockets etc. Types of computers.	09

Learning Outcomes:

Unit -I

- a. Students should able to define computer and peripherals*
- b. Students should able to understand memory structure utilized in computers*
- c. Students should able to explain storage devices*

Unit-II

- a. Students should able to differentiate software's and hardware's*
- b. Students should able to understand data representation*
- c. Students should able to explain several applications*

Unit-III

- a. Students should able to understand Operating system*
- b. Students should able to define memory management*
- c. Students should able to explain several types of OS*

Unit-IV

- a. Students should able to understand types of software's*
- b. Students should able to explain structure of motherboard*
- c. Students should able to explain several types of Computers*

Suggested reading:

1. Introduction to Computers :Rajmohanjoshi 4
2. Introduction to Computers :S. Vankatachalam
3. Basic of Computer :P K Singh
4. Computer basic : Michael miller
5. Basic operating system: Dr. R.C. Joshi
6. Computer networking : Wendell Odom
7. Data communication system :V. S. Bagad
8. Networking : Beasley
9. Internet : john Hamilton
10. The internet basic :Jason Whittaker

BFSE-108

Fundamental of Forensic Accountancy I

Credits:2

	Syllabus	lectures
Unit 1	Arithmetic And Geometric Progressions Definitions of A.P. and G.P., Formulae for nth term and sum to n terms of A.P. and G.P., Simple examples	09
Unit 2	Differential equation Defination of ordinary differential equation and degree, order of differential equation Exact differential equation with simple examples. Linear differential equation $dy + P(x)dx = Q(x)dx$ = method of solution with simple examples. Bernoulli's differential equation with examples. Application of differential equation i) Growth and decay problems ii) Newton's law of cooling with examples.	09
Unit 3	Modern Concepts of Forensic Accounting and Investigative Strategies Forensic Accounting – Introduction Principles of accounting – Basic concepts of forensic accounting Understanding Frauds – Fraud examination methodology – Introduction to Financial Statements, Money laundering : Basic concepts of money laundering- historical context laws related money laundering-various methods followed in money laundering-international money laundering council Financial examinations, fraud, theft, embezzlement, fictitious vendor schemes, tracing of matrimonial assets, reconstruction of income and expenses Occupational frauds and abuses Asset misappropriation Fraudulent disbursement Billing schemes Frauds involving Credit Cards and Cheques	09
Unit 4	Fraud Investigation & Documents Examination Fraudulent financial statement schemes Fictitious revenues Concealed liabilities and expenditures <ul style="list-style-type: none">• Red flags – associated improper disclosures and improper assets valuation• Understanding frauds in various sector: Frauds in Insurance, Frauds in Health Care, Frauds in Banking,	09

	<p>Frauds in Tax, Frauds in Stock Market / Securities, Consumer Frauds, Frauds in Public Sector, Frauds in Contract and procurement</p> <ul style="list-style-type: none">• Evidence collection – analysis- data interpretation-reporting• Whistle blowers and responses to fraud: whistle blower theory and whistle blowing practice• Frauds on intellectual property rights and implications	
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Suggested Reading:

1) Algebra and geometry by G. V. Khumbojkar.

2) Calculus and differential equation (Phadakeprakashan). Prof. L. G. Kulkarni, Dr. P. B. Jadhav 3) Shantinayakan - Text Book of Matrice

Practical Semester I
Practical -110
Section I- Fundamental of Forensic Science

Credit: 2

Sr. no.	Forensic Science Practical
1	To study the history of crime cases from forensic science perspective.
2	To cite examples of crime cases in which apprehensions arose because of Daubert standards.
3	To review the sections of forensic science at INTERPOL and compare with those in Central Forensic Science Laboratories in India. Includes suggestions for improvements if any.
4	To study the annual reports of National Crime Records Bureau and depict the data on different type of crime cases by way of smart art/templates.
5	To write report on different type of crime cases.

Note: Minimum 4 Practical should be conducted.

Practical Semester I
Section II - Criminal Law

Credit: 2

Sr. no.	Criminal Law
1	To prepare a schedule of five cognizable and five non-cognizable offences.
2	To study the powers and limitations of the Court of Judicial Magistrate of First Class.
3	To prepare a schedule of the offences which may be tried under Section 260(2) of Criminal Procedure Code.
4	To study a crime case in which an accused was punished on charge of murder under Section 302.
5	To study a crime case in which an accused was punished on charge of rape under Section 375.
6	To cite example of a case in which the opinion of an expert was called for under Section 45 of the Indian Evidence Act.

Note: Minimum 4 practical's should be conducted

BFSC 111
Practical Semester I

Credit - 2

Section I- Fundamental of Chemistry

Sr. no.	Fundamental Chemistry Practical
1	Preparation & standardisation Of H ₂ SO ₄ Solution.
2	Preparation & standardisation Of HCl Solution
3	Estimation of Acetamide
4	To determine the surface tension of given liquid
5	Organic Qualitative Analysis (3 compound)
6	Determination of amount of acetic acid in commercial vinegar
7	Water analysis
8	Volumetric estimation Of Potassium Permanganate

Note: Minimum 4 Practical should be conducted.

Practical Semester I
Section II - Fundamental of Physics

Credit - 2

Sr. no.	Fundamental Physics Practical
1	To determine the Poission's Ratio of a hallow rubber tube.
2	To determine Young's modulus (Y) of the wooden bar.
3	To determine the coefficient of viscosity of water by Poiseuille's methods
4	Determine Refractive index by using liquid lens
5	To Calibrate a Spectrometer using a mercury source.
6	To study the Zener diode as voltage regulator
7	To determine the wavelength of given (He-Ne LASER) LASER source by using plane diffraction grating.
8	To study the Exponential Decay of Amplitude of simple pendulum
9	To determine the Frequency of a.c. mains by sonometer using a wire of magnetic /non-magnetic material.

Note: Minimum 4 Practical should be conducted.

BFSC112

Section I Fundamental of Biology and Fundamental Psychology

Section I Fundamental of Biology

Credit: 2

Sr. no.	Fundamental Biology
1	To study the Use, care and study of compound Microscope.
2	To study the Glassware Sterilization
3	To study the Preparation of nutrient media and its sterilization i) Peptone water ii) Nutrient broth iii) Nutrient agar iv) Starch agar
4	To study the Microscopic examination of Bacteria by iii) Gram staining iv) Hanging drop technique of motility
5	To study the Microscopic examination of Bacteria by iii) Gram staining iv) Hanging drop technique of motility Chromatography-i) separation of Amino acids, ii) sugars using paper chromatography
6	To study the Thin layer chromatography, determination of RF values
7	To study the Isolation of chromosomal DNA

Note: Minimum 4 practical's should be conducted.

Section II : Fundamental of psychology

Sr. no.	Fundamental Psychology
1	To cite a crime case where legal procedures pertaining to psychic behavior had to be invoked.
2	To prepare a report on relationship between mental disorders and forensic psychology
3	To review a crime case involving serial murders. Comment on the psychological traits of the accused.
4	To cite a crime case involving a juvenile and argue for and against lowering the age for categorizing an individual as juvenile.
5	To study a criminal case in which hypnosis was used as a means to detect deception.
6	To prepare a case report on thematic appreciation test.
7	To prepare a case report on Minnesota multiphase personality inventory test.

Note: Minimum 4 practical's should be conducted.

BFSC113

Section I Fundamental of Digital and Cyber Forensic

Credit: 2

Sr. no.	Fundamental Digital and Cyber Forensic
1	Working with windows file (creation, modification, deletion, attributes) folder (creation, nesting, attributes)
2	Working with external storage devices using windows- Reading and writing data on floppy, CD,DVD, USB thumb drive
3	Working with external storage devices using Linux-reading writing data on floppy, CD, DVD, USB, thumb drive.
4	Understanding LAN-client/server, user creation, password protection.
5	Use of internet- visiting websites with given URL, Searching in Formation using search engine.
6	Working with hard drive and cloud storage.
7	Introduction to computer hardware and peripherals.

Note: Minimum 4 practical's should be conducted.

Section II : Fundamental Accountancy

Credit: 2

Sr. no.	Fundamental Accountancy Practical
1	Applications of differential equation ,Growth & decay
2	Applications of differential equation, Newton's law of cooling
3	Eigen values & Eigen vectors
4	Complex numbers: Geometrical representation of complex numbers (Argand's diagram) Graphical representation of Z^{-1} , $Z_1 + Z_2$, $Z_1 - Z_2$, $Z_1 \cdot Z_2$, Z_2 / Z_1 , $[Z - a] = b$.
5	Exact differntial eqation
6	Example on unit and controllability

Note: Minimum 4 Practical should be conducted.

SEMESTER II

BFSC-201 CRIMINOLOGY II

Credits: 2

Learning Objectives:

After studying this paper the students will know –

- a. The importance of criminology.
- b. The causes of criminal behavior.
- c. The significance of criminal profiling to mitigate crime.
- d. The consequences of crime in society.
- e. The elements of criminal justice system.

	Syllabus	Lectures
Unit 1	Basics of Criminology Definition, aims and scope, Theories of criminal behavior – classical, positivist, sociological. Criminal anthropology, Criminal profiling, Understanding modus operandi. Investigative strategy, Role of media.	09
Unit 2	Crime Elements, nature, causes and consequences of crime, Deviant behavior, Hate crimes, organized crimes and public disorder, domestic violence and workplace violence, White collar crimes, Victimology, Juvenile delinquency. Social change and crime, Psychological Disorders and Criminality. Situational crime prevention.	09
Unit 3	Criminal Justice System Broad components of criminal justice system, Policing styles and principles. Police's power of investigation, Filing of criminal charges, Community policing. Policing a heterogeneous society, Correctional measures and rehabilitation of offenders, Human rights and criminal justice system in India.	09
Unit 4	Cyber Crimes and digital evidence Cyber crimes and digital evidence: what is cyber crime, types of cyber crimes, digital evidence, Digital Vs Physical Evidence, Nature of Digital Evidence, Precautions, while dealing with Digital Evidence.	09

Learning Outcomes:

Unit-I

- a. *Students should be able to understand criminology*
- b. *Students should be able to understand criminal profiling, and other concepts of investigation*

Unit-II

- a. *Students should be able to understand concepts regarding Nature and types of crimes.*
- b. *Students should be able to understand different psychological disorder*

Unit-III

- a. *Students should be able to understand criminal justice system*
- b. *Students should be able to understand regarding human rights, Rehabilitation*

Unit-IV

- a. *Students should be able to differentiate between Physical evidences and digital evidences*
- b. *Students should be able to understand Nature of Digital Evidence.*

Suggested Readings:

1. D.E. Zulawski and D.E. Wicklander, *Practical Aspects of Interview and Interrogation*, CRC Press, Boca Raton (2002).
3. R. Saferstein, *Criminalistics*, 8th Edition, Prentice Hall, New Jersey (2004).
4. J.L. Jackson and E. Barkley, *Offender Profiling: Theory, Research and Practice*, Wiley, Chichester (1997). R. Gupta, *Sexual Harassment at Workplace*, LexisNexis, Gurgaon (2014).

BFSC202
Criminal Law II

Learning Objectives:

After studying this paper the students will know –

- a. The basics fundamental of computers.*
- b. The basics of operating system, networking, file system.*
- c. The types of digital crimes and vulnerabilities.*
- d. The elements involved in investigation of digital crimes*

	Syllabus	Lectures
Unit 1	Major acts-I Dowry Prohibition Act. Prevention of Food Adulteration Act. Prevention of Corruption Act.	09
Unit 2	Major acts-II Wildlife Protection Act. I.T.Act.2000 and its amendments. Environment Protection Act. Untouchability Offences Act	09
Unit 3	Major acts-III Drugs and Cosmetics Act. Explosive Substances Act. Arms Act.	09
Unit 4	Major acts-IV Narcotic Drugs and Psychotropic Substances Act. Essential Commodity Act.	09

Suggested reading:

1. NDPS Bare act
2. Prevention of Food Adulteration Bare Act.
3. NDPS Bare Act.
4. Explosive Substances Bare Act
5. Arms Bare Act.
6. I.T.Act.2000 and its amendments Bare Act
7. Environment Protection Bare Act.
8. Wildlife Protection Bare Act.
9. Untouchability Offences Bare Act
10. Prevention of Corruption Bare Act.
11. Essential Commodity Act.
12. Dowry Prohibition Bare Act.

BFSE 203
Fundamental Physics II

Learning Objectives:

After studying this unit the students will know -

- *To understand basic concept of laser physics.*
- *To understand basic concept of nuclear radiation.*
- *To understand basic concept of electronics, logic gates and derived logic gates.*

Credits: 2

	Syllabus	Lectures
Unit 1	<p>Laser A brief history of lasers, Einstein prediction : The Three Processes, Einstein's relations (qualitative discussion only). Pumping schemes. Characteristics of lasers, Types of lasers: 1.Ruby laser, 2. He-Ne laser, Applications of lasers.</p>	09
Unit 2	<p>Radioactivity Review of nuclear composition, nuclear properties and half life, Radioactive decay schemes, Applications of Radioisotope, Carbon dating, Radiometric dating.</p>	09
Unit 3	<p>Electronics Basics of LR, CR, LCR Circuits, Bridge Rectifier with π filter, Difference between regulated and unregulated power supply, Definition of Line and Load regulation, series and Shunt regulators. Basic logic gates: OR, AND, NOT, Derived gates: NOR, NAND,XOR, with symbols and truth tables, De Morgan's theorems and its verification.</p>	09
Unit 4	<p>Photography Physics of light, properties UV, Visible , IR, property of color Basic principles and applications of photography in forensic Science, 3D photography, photographic evidence, Infrared and Ultraviolet photography, Digital photography, Videography, Crime scene and laboratory photography.</p>	09

Learning Outcomes:

Unit I

- Describe the concept of stimulated emission and what is an active medium.
- Students will be able to know different types of laser.

Unit-II

- To learn types of radiation—alpha, beta, and gamma.
- Determine what a half-life is and how it relates to carbon dating.
- Students will be able to know basic process of carbon dating works.

Unit-III

- Students will be able to know concept of digital logic gates.
- Knowledge about the symbols and truth tables of basic and derived logic gates.
- To learn principle of operation, construction and characteristics of various electronic devices.

Unit IV

- The usefulness of photography and videography for recording the crime scenes.
- To give an understanding of the fundamentals behind photography, digital imaging, lighting and human vision emphasizing best practice in the forensic context.
- To enable students to optimize the capture and enhancement of images of crime scene marks to maximize their evidential potential.
- To enable students to produce an accurate high quality photographic record of a crime scene.

Suggested Readings:

1. An introduction to Lasers – Theory and Applications M. N. Avadhanalu, S.

Chand and Co, Ltd.

Pumping schemes (Ref.1, 1.1 – 1.12, 1.15, 1.16, 1.18-1.20).

Characteristics of lasers (Ref. 2, 11.7.1 – 11.7.4)

Types of lasers : 1. Ruby laser, 2. He-Ne laser (Ref.1 , 2.2.1, 2.3.1)

Applications of lasers (Ref. 2, 11.9, 11.10, 11.11, 11.12)

2. Electronics Principles, Malvino, 7 th Edition TaTa Mc-Graw Hills.

3. Principles of Electronics, V. K. Mehta, S. Chand Publication New Delhi.

4. Op Amp and Linear integrated circuits, Ramakant Gaikwad, Prentice Hall of India Pub.

5. Integrated Circuits, Botkar, Khanna Publications, New Delhi

6. Digital Principles and Applications, Malvino and Leech Tata Mc-Graw Hills Pub.

7. http://en.wikipedia.org/wiki/History_of_Physics

8. http://en.wikipedia.org/wiki/Nobel_Prizes_in_Physics.

9. D.R. Redicker, the practical methodology of forensic Photography, 2nd Edition, CRC Press, Boca Raton (2000)

BFSE- 204
Forensic Biology II

Learning Objectives:

After studying this paper the students will know –

- a. The importance of immune system development.*
- b. The basic principle of . immune system disorders*
- c. The basic knowledge of biochemistry..*
- d. The basic principle of . biotechnology.*
- e. To study the plant morphology.*

Credit: 2

	Syllabus	Lectures
UNIT I	<p>Immunology Immunity: Introduction, Types of immunity, Immune System development, Immune System organs, Immune System cells. B cell / T cell development, Antigen-antibody:. Immunoglobulins structure & its types, Antigen-antibody reaction, ABO Blood Grouping.Organ Transplantation and its types. Immune system disorders, Failures of Body defenses.</p>	09
UNIT II	<p>Biochemistry Properties, classification and function of Carbohydrates Properties, classification and function of Proteins , Properties, classification and function of Nucleic acids, Properties, classification and function of Lipids Properties, classification and function of Enzymes</p>	09
UNIT III	<p>Microbiology and Biotechnology Historical introduction to microbiology.Basics of introduction to microbiology and concepts of pure culture technique.Broad classification of microorganisms. Fundamentals of recombinant DNA technology and its application in Health and disease.Western and blot technique.</p>	09
UNIT IV	<p>Plant Morphology Principles of taxonomy and system of classification of angiosperms (Bentham and Hooker)and Gymnosperms (chamberlain) origin of life and Geological time scale mechanical and conductive tissue system in plants.</p>	09

Learning Outcomes

UNIT I : Immunology

- *Student studied the introduction of immune system.*
- *Student will be know the organ transplantation and its types.*

UNIT II: Biochemistry

- *Student will be know the different properties classification and also function of the Carbohydrates, Proteins, Nucleic acids, Lipids, and Enzymes.*

UNIT III: Microbiology and Biotechnology

- *Students will able to know the describe unique introduction of microbiology*
- *Students will understand the western and southern blotting system.*

UNIT IV: Plant Morphology

- *Students will understand the different plant morphology.*
- *Students will understand the difference between angiosperms and gymnosperms*

Suggested Reading

1. Gymnosperms- Vashishta (1976)
2. Gymnosperms- Chamberlein (1966)
3. Morphology of Angiosperms - Eames A. J. (1961)
4. Morphology and Evolution of Vascular Plants –Gifford E. M., Foster A. S. (1989)
5. Morphology of Gymnosperms - Sporne K. R. (1967)
6. Morphology of Gymnosperms - Coulter and Chamberlein (1978)
7. Morphology of Pteridophytes - Sporne K. R. (1966)
8. Principle of Biochemistry by Lehninger.
9. . Microbiology by Prescott, Herley and Klein, IInd edition.
10. General Microbiology Vol I and II by Powar and Daginawala, Himalaya Publications

BFSC205
Fundamentals of Forensic Psychology

Learning Objectives: After studying this paper the students will know –

- a. The overview of forensic psychology and its applications.
- b. The legal aspects of forensic psychology.
- c. The significance of criminal profiling.
- d. The importance of psychological assessment in gauging criminal behavior.
- e The tools and techniques required for detection of deception.
- f. The critical assessment of advanced forensic techniques like polygraph, narco analysis and brain electrical oscillation signature

Credit :2

	Syllabus	Lectures
Unit 1	<p>Basics of Forensic Psychology Definition and fundamental concepts of forensic psychology and forensic psychiatry. Psychology and law. Ethical issues in forensic psychology. Case studies - "Nithari Hatyakand" , "Hannibal" -the silence of the lamb, Joseph Paul Franklin, New York's Mad Bomber, Machine Gun "Kelly", The Vampire Rapist- John Crutchely.</p>	09
Unit 2	<p>Assessment of mental competency and Psychology of Evidence 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.</p>	09
Unit 3	<p>Detection of Deception Tools for detection of deception – interviews, non-verbal detection, statement analysis, voice stress analyzer, hypnosis, LVA.</p>	09
Unit 4	<p>Polygraphy and Narco analysis Polygraphy – operational and question formulation techniques, ethical and legal aspects, the guilty knowledge test. Narco analysis and brain fingerprinting e – principle and theory, ethical and legal issues.</p>	09

Suggested Readings

1. A.A. Monessen's, J. Starrs, C.E. Henderson and F.E. Inbau, *Scientific Evidence in Civil and Criminal Cases*, 4th Edition, The Foundation Press, Inc., New York (1995).
2. R. Saferstein, *Criminalistics*, 8th Edition, Prentice Hall, New Jersey (2004).
3. J.C. DeLadurantey and D.R. Sullivan, *Criminal Investigation Standards*, Harper & Row, New York (1980).
4. J. Niehaus, *Investigative Forensic Hypnosis*, CRC Press, Boca Raton (1999).
5. E. Elaad in *Encyclopedia of Forensic Science, Volume 2*, J.A. Siegel, P.J. Saukko and G.C. Knupfer (Eds.), Academic Press, London (2000).

BFSC206

Digital And Cyber Forensic

Learning Objectives:

After studying this paper the students will know –

- a. The basics fundamental of computers.
- b. The basics of operating system, networking, file system.
- c. The types of digital crimes and vulnerabilities.
- d. The elements involved in investigation of digital crimes

Credit :2

	Syllabus	Lectures
Unit 1	File allocation tables and Basics of networking File Systems and Networking, FAT12, FAT16, FAT32, NTFS, Ext2, Ext3 & HFS. Learning extensions, File system management,	09
Unit 2	Basics of networking Basics of Networking – Types of topologies, LAN, MAN, WAN, SAN, CAN etc. Types of internet connections (Dialup, DSL, Cable, broadband, leased line, satellite , Wi-Fi, 3G-4G) ISP , IP grouping.	09
Unit 3	Basics of Internet Introduction to Internet web and cloud based application, World Wide Web, E-mails, Chat, Search Engines, Types of portals, Networking Protocols.	09
Unit 4	Network Security Network Security – Threats, Vulnerabilities, Access control, Virus, Trojans, Security plan and policies.	09

Suggested reading:

1. Introduction to Computers : Rajmohanjoshi 4
2. Introduction to Computers :S. Vankatachalam
3. Basic of Computer :P K Singh
4. Computer basic : Michael miller
5. Basic operating system: Dr. R.C. Joshi
6. Computer networking : Wendell Odom
7. Data communication system :V. S. Bagad
8. Networking : Beasley
9. Internet : john Hamilton
10. The internet basic :Jason Whittaker

BFSC207
Forensic Statistics II

Credit: 2

	Syllabus	Lectures
Unit I	Introduction to statistics and collection of data., Meaning of statistics, Scope of statistics in Biological and medical sciences , Primary and Secondary data ,Classification of data, Inclusive and Exclusive methods, Discrete and Continuous frequency distribution. ,Cumulative frequencies Graphical representation :- Histogram and ogive curves	09
Unit II	Measures of central tendency and measures of dispersion,Concept of measures of central tendency , Definitions of A.M., Median, Mode, Quartiles, Weighted mean, Examples on ungrouped and grouped data.,Properties of A.M. (statement only) , Methods of obtaining mean & quartiles graphically ,Concept of measures of dispersion . Absolute and Relative measures of dispersion. ,Definitions of Range, Q.D, S.D and variance , coefficient of variation. Examples on grouped and ungrouped data	09
Unit III	Correlation and Regression Concept of correlation between two variables and types of correlation. Method of obtaining correlation (i) by scattar diagram method ii) By Karl Pearson Correlation coefficient iii) By Spearman's Rank correlation coefficient with and without tie. Properties of correlation coefficient. Examples on ungrouped data, Concept of regression, Lines of regression Regression coefficients and properties without proof. , Examples on ungrouped data. , Idea of multiple and partial correlation	09

Unit IV	<p>Probability and Sampling Definition of sample space, Outcomes, events, exhaustive events, Mutually exclusive events, Equally likely events, certain events impossible events.,</p> <p>Definition of probability, Limits of probability. Probability of complementary event, Additive law of probability. Simple illustrative examples.</p> <p>Definition of conditional probability, Multiplicative law of probability, Independent events, Simple illustrative examples.</p> <p>Idea of population and sample. Simple Random Sampling and Stratified Random sampling. Advantages and disadvantages of both the methods.</p> <p>Testing of hypothesis Simple and composite hypothesis, Null and alternative hypothesis, types of errors, Critical region, Acceptance region, level of significance. 4.6 Tests of significance: Chi square tests, t tests and F</p>	09
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Suggested Reading:

- 1) Goon A. M., Gupta M. K. and Dasgupta B.: Fundamentals of mathematical statistics vol. I & II. World Press, Calcutta.
- 2) Gupta & Kapoor: Fundamental of mathematical statistics.
- 3) Thingale T. K. and Dixit P. G. (2003): A text book of paper- I for B.Sc. I, NiraliPublication, Pune.
- 4) Waiker and Lev: Elementary Statistical methods.
- 5) Rohatgi V. K. and Sauh A. K. Md E. (2002) An Introduction to probability and statistics (John Wiley & Sons-Asia).
- 6) Thigale T. K. and Dixit P. G. (2003): A text book Of paper II for B.Sc. I.
- 7) Meyer P. L. (1970): Introductory to probability and statistical Application. Addisonwesly.

BFSC Practical-210

Section I : Forensic Science

Credit: 2

Sr. no	Forensic Science practical
1	To study Law of individuality.
2	To study Locards principle of exchange.
3	To study Law of progressive of change.
4	To study Law of comparison.
5	To study Law of analysis.
6	To study Law of Probability.
7	To study Law of Circumstantial Facts.

Note: Minimum 4 Practical should be conducted.

Practical- BFSE -211

Section I : Fundamental Physics

Credit: 2

Sr. No.	Fundamental Physics Practicals
1	To determine the temperature coefficient of resistance of given coil.
2	To study the voltage regulation and calculate ripple factor of bridge rectifier with π filter .
3	Transistor (CE) characteristics: Output characteristics
4	To Study of Basic Logic Gates.
5	To study De Morgan's theorems
6	To determine the dc resistance of inductor (LCR series resonance)
7	To plot polar intensity distribution curve for an electric bulb using photo electric cell .
8	Spectrometer (determination of angle of prism A)
9	To determine M.I. of a rod using Bifilar suspension.
10	To determine the 'g' acceleration due to gravity using Kater's Pendulum.

Note: Minimum 4 Practical should be conducted.

Section II Forensic Chemistry

Credit: 2

Sr.no	Forensic Chemistry practical
1	Preparation & standardisation Of H_2SO_4 Solution.
2	Preparation & standardisation Of HCl Solution
3	Estimation of Acetamide.
4	To determine the surface tension of given liquid
5	Organic Qualitative Analysis (3 compound)
6	Determination of amount of acetic acid in commercial vinegar
7	Water analysis
8	Volumetric estimation Of Potassium Permagnate

Note: Minimum 4 practicals should be conducted.

BFSC212
Section – I Forensic Biology

Credit: 2

Sr. No	Forensic Biology
1	Study of morphological types of red blood cells
2	Antigen-antibody reaction (blood groupings)
3	Study of body fluids – i) Saliva ii) Urine iii) Blood iv) Sweat
4	Mitochondria – Stained preparation of mitochondria from i) Onion peeling ii) Hydrilla leaf iii) Oral mucosa by using Janus Green B.
5	Examples based on Monohybrid cross, Dihybrid cross and Multiple Alleles (At least 10 examples must be solved)
6	Preparation of buffers (Phosphate buffer, acetate buffer) and determination of pH with pH meter
7	General test for carbohydrates and detection of unknown carbohydrate (Glucose, fructose, maltose, sucrose, xylose and starch) Benedict's Method

Minimum 4 Practical should be conducted.

Section – II Fundamental Psychology

Credit: 2

Sr. No.	Fundamental Psychology
1	To prepare a case report on thematic appreciation test.
2	To prepare a case report on word association test.
3	To prepare a case report on Bhatia's battery of performance test of intelligence.
4	To cite a criminal case in which narco analysis was used as a means to detect deception.
5	Draw a tree
6	HTP
7	CPQ
8	Sack's Sentence completion test.

Minimum 4 Practical should be conducted.

BFSC213

Section – I Digital and Cyber Forensics

Credit:2

Sr. No.	Digital and Cyber Forensics practical
1	Use of E-mail, creating e-mail, sending and receiving e-mails with attachments.
2	Networking commands- like ping, IP config. etc, with various switches.
3	Tracing E-mail, finding senders IP address, of received email, tracing route of email received using tool available on internet, e.g. Visual Trace Route etc.
4	Working with Ms-office (word, excel, power-point).
5	Understanding Firewall

Minimum 4 Practical should be conducted.

Section II : Forensic Statistics

Credit: 2

Sr. no.	Forensic Statistics
1	Frequency distribution – Graphical, Histogram, ogive curve [less & greater than].
2	Measures of central tendency (Grouped and Ungrouped) A. M., Median, Mode.
3	Measures of Dispersion – Range, s. d., C. V. combined s. d.
4	Correlation, Regression. Scattered diagram, Karl Pearson's correlation coefficient, eqn of Regression line
5	Testing of Hypothesis: Large sample test: Normal, proportion. Small sample test.: χ^2 , t, f.

Note: Minimum 4 Practical should be conducted.

Section – II Criminal Law

Credit: 2

Sr. No.	Criminal Law practical
1	To cite a case wherein a person was detained under Article 22(5) of the Indian Constitution. Express your views whether the rights of the person as enlisted in this Article were taken care of.
2	To cite a case under Article 14 of the Constitution of India wherein the Right to Equality before Law was allegedly violated.
3	To list the restrictions imposed on Right to Freedom of Worship under the Constitution of India.
4	To prepare a schedule of persons convicted under Narcotics, Drugs and Psychotropic Act statistically analyze the age group to which they belonged.
5	To study a case in which Drugs and Cosmetic Act was invoked.
6	To study a case in which Explosive Substances Act was invoked.
7	To study a case in which Arms Act was invoked.
8	In light of Section 304B of the Indian Penal Code, cite a case involving dowry death.
9	To study a case wherein the Untouchability Offences Act was invoked on the basis of Article of the Constitution of India.

Minimum 4 Practical should be conducted.

