JSPM University Pune

Faculty of Health Sciences

School of Forensic Sciences

NEP aligned Syllabus

for

B.Sc. (Forensic Science)

(Effective from AY: 2023-24)

Dean
FACULTY OF HEALTH SCIENCES
JSPM UNIVERSITY PUNE

JSPM UNIVERSITY PUNE
Recognized by the UGC u/s 2 (f) of UGC Act 1956 and enacted by the
State Government of Maharashtra - JSPM University Act, 2022 (Mah. IV of 2023)

B.Sc. (Forensic Science)

Semester - I

Level – 4.5

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme (Hrs. per week)				Examination and Marking Scheme			Credits
				L	T	P	EL	TH	PR	OR	
01	PCC	230HFSB01_01	Crime Scene Investigation and Evidences	2	1	-	-	100	-	-	3
02	PCC	230HFSB02_01	Introduction to Forensic Science and Criminal Law	2	1	-	-	100	-	-	3
03	IOC	230VBBB06_01	Essentials of Management	2	-	-	-	100	-	-	2
04	SEC	230UPYB12_01	Introduction to Research Paper Writing	2	-	2	-	-	50	50	3
05	VSC	230HFSB03_01	Introduction to Computers and Windows	1	-	-	2	-	-	50	1.5
06	AEC (HSMC)	230UENB01_01	Effective Communication Skills	1	-	2	-	50	-	-	2
07	IKS (HSMC)	230UHIB01_01	States in Ancient India	2	-	-	-	50	-	-	2
08	VEC/EEC	230GCEB02_01	Environment and Sustainability	2	-	-	-	50	-	-	2
09	LC	230HFSB04_01	Crime Scene Investigation and Evidences Lab	-	-	4	-	-	50	50	2
10	LLC	230HFSB05_01	Human Anatomy and Physiology	-	-	2	2	-	50	-	1.5
Total Academic Engagement and Credits				**14**	**2**	**10**	**4**	**450**	**150**	**150**	**22**
				26				**750**			

Semester - II

Level – 4.5

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme (Hrs. per week)				Examination and Marking Scheme			Credits
				L	T	P	EL	TH	PR	OR	
01	PCC	230HFSB07_02	Forensic Fingerprints	2	-	2	-	100	-	-	3
02	PCC	230HFSB08_02	Instrumental Methods of Analysis	2	-	-	-	100	-	-	2
03	PCC	230HFSB09_02	Criminal Justice Administration	2	-	-	-	50	-	-	2
04	MMC	230HFSB10_02	Essentials of Programming Languages	1	-	2	-	-	50	50	2
		230HFSB11_02	Biomolecules								
05	SEC	230VBCB09_02	Financial Literacy	2	-	2	-	-	50	50	3
06	VSC	230IDCB01_02	Design Thinking and Creativity	1	-	-	2	-	-	50	1.5
07	AEC (HSMC)	230UENB02_02	Communicative Proficiency Skills	1	-	2	-	50	-	-	2
08	VEC/EEC (HSMC)	230UPYB03_02	Ethics and Moral Values	2	-	-	-	50	-	-	2
09	LC	230HFSB12_02	Forensic Analysis Lab	-	-	2	-	-	50	-	1
10	LLC	230UPYB02_02	Mindfulness and Wellbeing	1	-	-	2	-	-	50	1.5
11	IITP/FP/CEP	230HFSB13_02	Internship/Field Project/Community Engagement Programme	4 to 6 weeks				-	-	50	2
Total Academic Engagement and Credits				**14**	**-**	**10**	**4**	**350**	**150**	**250**	**22**
				24				**750**			

Note: A **Certificate** will be awarded if a student exits after first year.
For Exit at the end of first year the student must complete: (Total credits =8)
a) An internship / OJT of 8 - 10 weeks (4 credits)
b) Additional Course 1 (4 credits) (Course offered will be Vocational Skill Course (VSC) or Skill Enhancement Course (SEC))

JSPM University Pune F.Y. B.Sc. Forensic Science Semester I		
Course Type: PCC	**Course Title: Crime Scene Investigation and Evidences**	
Course Code: 230HFSB01_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 3	**Lecture (L): 2** **Tutorial (T): 1** **Practical (P): 0** **Experiential Learning (EL): 0**	**Theory (TH): 100 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- To make students acquainted with the detail process of crime scene investigation.
- To understand the forensic significance of various types of evidences.

Course Outcomes: Students completing the course will be able to:

CO1: Identify and define crime scene and its importance and will able to classify the crime scene.
CO2: Analyze and compare various physical evidences found on the crime scenes.
CO3: Explain crime scene investigation process in detail.
CO4: Apply various scientific techniques in crime scene investigation.
CO5: Demonstrate an ability to manage the crime scene.
CO6: Classify the blood spatter patterns.
CO7: Reconstruct crime scene based on available evidences.

Course Contents

Unit I	Introduction to Crime Scene	(7 Hrs)
Definition of crime scene, Classification of crime scene: indoor and outdoor, primary and secondary, macroscopic and microscopic crime scene, Significance of crime scene, Corpus delicti and Modus operandi		
Unit II	**Introduction to Physical Evidences**	**(7 Hrs)**

Definition of Physical Evidence, Types of physical evidence: movable and immovable evidence; documentary evidence, biological evidence, chemical evidence, pattern evidence, ballistic evidence, digital and electronic evidence, conditional evidence, trace evidence, transient evidence and associative evidence, Significance of physical evidences.

Unit III	Crime Scene Management	(8 Hrs)

Crime scene management and its component: Information management, Manpower management, Technology management and Logistics management, Processing of crime scene: initial survey, assistance to victims, Securing the scene, Role of first responding officer

Unit IV	Crime Scene Investigation	(8 Hrs)

Documentation of crime scene, searching methods of evidences at scene of crime, Methods for collection and packaging of evidence, Forwarding the evidence to forensic science laboratories, Maintaining chain of Custody, Duties and responsibilities of crime scene investigator

Unit V	Impression Evidences	(7 Hrs)

Footprint: Introduction, collection, gait pattern and its importance in person identification. Tire marks: Introduction, types, characteristics, forensic significance. Lip print: Introduction to cheiloscopy, classification, collection and forensic examination. Trace evidences: Paint, soil, glass, fibers, hair etc.

Unit VI	Blood Stain Pattern and Crime Scene Reconstruction	(8 Hrs)

Bloodstain Pattern: Physical and biological properties of human blood, Classification: spatter and non-spatter pattern, Crime Scene reconstruction (CSR): Nature and Importance of CSR, Basic principles and stages: Data collection, Conjecture, Hypothesis formulation, testing and theory formation, Role of logic in CSR.

Learning Resources

Reference Books:

1. Henry Lee's Crime Scene Handbook: Henry C Lee.
2. Rao, M.S. and Maithil, B.P. Crime Scene Management: A Forensic Approach 3rd ed. Selective & Scientific Books: India; (2018)
3. Nanda, B.B. and Tiwari, R.K. Forensic Science in India- A Vision for the Twenty First Century. Select Publisher: New Delhi; (2001)
4. James, S.H. and Nordby, J.J. Forensic Science: An Introduction to Scientific and Investigative Techniques. CRC Press: USA; (2003).
5. Saferstein, R. Criminalistics -An Introduction to Forensic Science. Prentice Hall: USA; (1995).
6. Jacquiline T. Fish and Larry S. Miller, Crime Scene Investigation.
7. Bennett W.W. and Hass K.M. Criminal Investigation 6th ed. Wordsworth Thompson Learning: (2001).
8. Barry, A.J. Fisher- Techniques of Crime Scene Investigation, 7th ed. R.C. Press, New York (2003)

9. James S.H and Eckert, W.G. Interpretation of Bloodstains Evidence at Crime Scene 2nd ed.CRC Press: (1998).
10. James S.H; Scientific and Legal Application of Blood Stain Pattern Analysis.CRC Press: Florida; (1998).
11. Sharma, B.R. Forensic Science in Criminal Investigation and Trails. Universal Law Publishing: (2003).
12. Seigel, J.A., Saukko, P.J. and Knupfer, G.C. Encyclopedia of Forensic Science vol. I, II& III. Academic Press: United States; (2000).
13. Gross, H. Criminal Investigation- A Practical Handbook for Magistrates, Police Officers and Lawyers. Forgotten Books: India; (2000).
14. Bell, W.R. Practical Criminal Investigation in Correctional Facilities. CRC Pres: London; (2001).
15. Tom Bevel, Ross Gardner, Bloodstain pattern analysis with Introduction to crime scene reconstruction, Third edition.
16. B.S. Nabar, Forensic Science in Crime Investigation, 3rd ed.
17. William Bodziak, Footwear Impression Evidence - Detection, Recovery and Examination, 2nd ed.

JSPM University Pune F.Y. B.Sc. Forensic Science Semester I		
Course Type: PCC	**Course Title: Introduction to Forensic Science and Criminal Law**	
Course Code: 230HFSB02_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 3	**Lecture (L): 2** **Tutorial (T): 1** **Practical (P): 0** **Experiential Learning (EL): 0**	**Theory (TH): 100 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- To make students understand the history, development, and fundamental laws of forensic science.
- To under the organization set-up of forensic science laboratories.
- To comprehend crime detection agencies, constitutional articles and legal provisions related to Forensic Science

Course Outcomes: On completion of the course, learner will be able to

CO1: Understand the various branches and future scope in forensic science.
CO2: Apply the fundamental principles of forensic science to solve crimes.
CO3: Understand the pioneers involved in the history and development of forensic science.
CO4: Comprehend the different laboratories i.e., CFSL, SFSL, Mini laboratories their structure and function in criminal investigation.
CO5: Comprehend the functions, responsibilities, and ethics to be followed as a forensic scientist.
CO6: Understand the structure and function of Indian Judiciary system.
CO7: Figure out the articles of Indian constitution as well as legal provisions pertaining to forensic science.

Course Contents

Unit I	**History and Fundamentals of Forensic Science**	**(7 Hrs)**

Introduction to Forensic Science, Definition and scope of Forensic Science, Laws and Principles of Forensic Science, History and development of Forensic Science (Global and Indian perspective)

Unit II	Scientific Contributions and Branches of Forensic Science	(7 Hrs)
Specific contribution of scientists in the field of Forensic Science, Multi professional and multi personal aspects of forensic science, Branches of forensic science, Ethics of Forensic Science.		
Unit III	**Organizational set-up of Forensic Science Laboratory**	**(8 Hrs)**
Structure and function of State and regional Forensic Science Laboratory, Directorate of Forensic Science Services and Forensic Science Laboratories in India, Central Forensic Science Laboratory and facilities provided, Mobile Forensic Science Laboratory, Function and responsibility of forensic scientists, Role of FSL in criminal investigation,		
Unit IV	**Criminal Justice System**	**(7 Hrs)**
Crime: definition, elements, and types of crime, Criminal Justice System: Definition and component, structure and functions of law enforcement agencies (police), Structure and functions of courts, hierarchy and powers of the court and structure and functions of corrections, Court testimony: Admissibility of expert testimony, pre-court preparation and court appearance, examination-in-chief, cross-examination, and re-examination		
Unit V	**Crime Detection Agencies and Constitutional Articles**	**(9 Hrs)**
Introduction to Crime Detection Agencies: NCRB, BPR&D, CBI, CID, NIA, IB, R&AW, Interpol, etc., Constitution of India: Article 14 to 18 and 19 to 22		
Unit VI	**Legal Provisions related to Forensic Science**	**(8 Hrs)**
Indian Penal Code: Essentials of Crime, cognizable and non-cognizable offence, bailable and non-bailable offence, compoundable, non-compoundable offences and punishments; Offences against Person – Sections 299, 302, 304B, 306, 307, 319, 320, 326, 339, 340, 351, 359, 362, 375, 376, 377; Offences against Property- Sections 378, 383, 390, 499. Indian Evidence Act- Sections 32, 45, 46, 47, 57, 58, 60, 73, 135, 136, 137, 159. Criminal Procedure Code: Sections 291, 292, 293.		

Learning Resources

Reference Books:

1. Nanda, B.B. and Tiwari, R.K. Forensic Science in India- A Vision for the Twenty First Century. Select Publisher: New Delhi; (2001).
2. James, S.H. and Nordby, J.J. Forensic Science: An Introduction to Scientific and Investigative Techniques. CRC Press: USA; (2003).
3. Saferstein, R. Criminalistics -An Introduction to Forensic Science. Prentice Hall Inc: USA; (1995).
4. Bennett W.W. and Hass K.M. Criminal Investigation 6th ed. Wordsworth Thompson Learning: (2001).
5. Fisher, B.A.J. Techniques of Crime Scene Investigation 7th ed. R.C. Press: New York; (2003).
6. Nordby, J.J. Dead Reckoning-The Art of Forensic Detection. CRC Press LLC: (1999).
7. Sharma, B.R. Forensic Science in Criminal Investigation and Trails. Universal Law Publishing: (2003).

8. The Indian Evidence Act (1872), Amendment Act (2002), Universal Law Publication: (2003).
9. The Code of Criminal Procedure (1973), Amendment Act (2001), Universal Law Publication: (2002).
10. Lal, R and Lal, D. The Indian Panel Code 28thed. Wadhwa &Co: Nagpur; (2002).
11. Swanson, C.R., Territo, L.I. and Taylor, R.W. Police Administration: Structures, Processes and Behaviour 8th ed.Pearson: USA; (2012).
12. Ahuja, R. Criminology. Rawat Publication: Jaipur; (2000).
13. Meguire, M., Morgan, R. and Reiner, R.The Oxford Handbook of Criminology 2nded. Oxford University Press: New York; (2002).
14. Bag, R.K. Supreme Court on Criminal Law. Asia Law House: (1999).
15. Deb, R. Criminal Justice. The Law Book Co. Pvt. Ltd:Allahabad; (1998).
16. Seigel, J.A.,Saukko, P.J. and Knupfer, G.C. Encyclopedia of Forensic Science vol. I, II& III. Academic Press:United States; (2000).
17. Bridges, B.C. Criminal Investigation, Practical Fingerprinting, Thumb Impressions, Handwriting Expert Testimony, Opinion Evidence. University book Agency: Allahabad; (2000).
18. Gross, H. Criminal Investigation- A Practical Handbook for Magistrates, Police Officers and Lawyers. Forgotten Books: India; (2000).
19. Bell, W.R. Practical Criminal Investigation in Correctional Facilities. CRC Pres: London; (2001).
20. Lyman M.D. Criminal Investigation- The Art and the Science. Pearson Education: India; (2013)

JSPM University Pune F.Y. B.Sc. Forensic Science Semester I		
Course Type: IOC	**Course Title: Essentials of Management**	
Course Code: 230VBBB06_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 2 Tutorial (T): 0 Practical (P): 0 Experiential Learning (EL): 0**	**Theory (TH): 100 Marks**

Prerequisite Courses, if any:

1. Basics of Management (Available on Great Learnings)
2. Basics of Leadership (Available on Oxford Home Study Centre)

Course Objectives:

To enable the students:

- To study the evolution of Management,
- To study the functions of principles of management and
- To learn the application of the principles in an organization.
- To learn the Leadership skills in Management.
- To study the goal setting by Management Objective Theory

Course Outcomes: On completion of the course, learner will be able to

CO1: To explain the evolution of Management and its principles

CO2: Describe how the managerial tasks of planning, organizing, and controlling can be carried out in a variety of situations

CO3: Incorporate management principles into daily operations.

CO4: Analyze the global situation, including opportunities and threats that will affect organizational management.

CO5: Identify the most effective course of action to take in specific situations.

CO6: Evaluate managerial practices and decisions considering ethical principles and standards.

Course Contents

Unit I	Introduction	(5 Hrs)
Managing: Science or Art?, Evolution of Management Thoughts, Management Theories, Role of a Manager, Managerial Skills		
Unit II	**Management Organization Structure**	**(5 Hrs)**

Functions of Management, Systematic approach to Management Process, Organizational Dynamics, Coordination in Management, Strategic Management		
Unit III	**The Function of Manager**	**(5 Hrs)**
Planning: Strategic Planning Process, Organizing: Structure and Process of Organization, Directing: Foundations of individual and group behavior, Staffing: The System Approach to Human Resource Management, Controlling: System and process of controlling		
Unit IV	**Management by Objectives**	**(5 Hrs)**
Core Concepts of MBO, Characteristics of Management by Objectives, Process of MBO, Defining the Goal, Action Plan		
Unit V	**Leadership and Management**	**(5 Hrs)**
Manager Vs Leader, Committees and Group Decision Making, Managerial Decision Making, Leadership traits and ethics, Roles, functions and characteristics of a leader		
Unit VI	**General Overview of all the Units**	**(5 Hrs)**
Case Study: Skills of an effective Manager, Phases of Strategic Management, Final Review on Management by Objective		

Learning Resources

Text Books:

1. Stephen P. Robbins, David A. Decenzo, 2016. Fundamentals of Management, Pearson Education, 9th Edition
2. Harold Koontz, O'Donnell and Heinz Weihrich, 2012. Essentials of Management. New Delhi, 9th edition, Tata McGraw Hill

Reference Books:

1. Fundamentals of Management by Robbins, S.P. and Decenzo
2. Management - Text & Cases, Satya Raju
3. Principles of Management – Davar

MOOC / NPTEL Courses:

1. https://onlinecourses.nptel.ac.in/noc23_mg33/preview
2. https://onlinecourses.swayam2.ac.in/nou23_mg04/preview

Additional Web Resources:

https://onlinecourses.swayam2.ac.in/cec22_mg20/preview
https://www.coursera.org/learn/fundamentals-of-management?trk_ref=articleProductCard&utm_source=gg&utm_medium=sem&utm_campaign=B2C_INDIA__branded_FTCOF_courseraplus_arte_PMax&utm_content=Degree&campaignid=19607944793&adgroupid=&device=c&keyword=&matchtype=&network=x&devicemodel=&adpostion=&creativeid=&hide_mobile_promo&gclid=EAIaIQobChMI16Sgpqmh_gIV2pNmAh1YIAWQEAAYASAAEgKWuvD_BwE#modules

JSPM University Pune F.Y. B.Sc. Forensic Science Semester I		
Course Type: SEC	**Course Title: Introduction to Research Paper Writing**	
Course Code: 230UPYB12_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 3	**Lecture (L): 2** **Tutorial (T): 0** **Practical (P): 2** **Experiential Learning (EL): 0**	**Practical (PR): 50 Marks** **Oral (OR): 50 Marks**
Prerequisite Courses, if any: Nil		

Course Objectives:

- The aim of the undergoing course is to make Graduate students familiar with the basic research concepts, Idea, and process behind it.
- This course aims at developing understanding of writing a good research paper and consideration of issues which should be involved during publishing a research paper.
- Thus, creating a research friendly environment for students.

Course Outcomes: On completion of the course, learner will be able to

CO1: Recognize potential areas of research.
CO2: Summarize the knowledge of different methods of research.
CO3: Understand research steps.
CO4: inculcate ethics of research.
CO5: Develop basic skills of research paper writing
CO6: To demonstrate their training on research paper writing.

Course Contents

Unit I	Introduction to Research	(8 Hrs)
What is Research? Basic concepts, Aim of Research, criterion of good research, Method vs methodology. Types of research: Descriptive Research, Empirical, Exploratory, Experimental, Mixed		
Unit II	**Methods and Tools**	**(12 Hrs)**
Survey, Case study, Ethnography, Content Analysis, Quantitative Data Collection, Qualitative Data Collection		
Unit III	**Steps of Research**	**(10 Hrs)**

Problem identification/ formulation, Research question hypothesis, Research Method identification, Data collection, Data analysis, Result analysis and interpretation		
Unit IV	**Developing Research Paper**	**(10 Hrs)**
Abstract Writing, Introduction to Literature review, Basic ideas about Research design, Major findings, Conclusion		
Unit V	**Ethics of Research**	**(7 Hrs)**
Plagiarism, Citations, Referencing, Copyright		
Unit VI	**Writing a Research Paper**	**(12 Hrs)**
Each student will write a full-fledged research paper, identify sources of submission, and present a PPT on the same in class.		

Learning Resources

Text Books:

1. Singh A.K. (2006). 5th ed. Tests, Measurement and Research Methods in Behavioural Sciences. Patna: Bharati Bhavan

Reference Books:

1. Kothari, C. R. (2004). Research Methodology: Methods and Techniques. New Delhi: New Age International.
2. Kumar, R. (2005). Research Methodology-A Step-by-Step Guide for. Singapore: Pearson Education

MOOC / NPTEL Courses:

Link of the Course: https://nptel.ac.in/courses/110105091, Prof. Aradhna malik, IIT Kharagpur

JSPM University Pune F.Y. B.Sc. Forensic Science Semester I		
Course Type: VSC (HSMC)	**Course Title: Introduction to Computers and Windows**	
Course Code: 230HFSB03_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 1.5	**Lecture (L): 1** **Tutorial (T): 0** **Practical (P): 0** **Experiential Learning (EL): 2**	**Oral (OR): 50 Marks**
Prerequisite Courses, if any: Nil		

Course Objectives:

The specific objectives of the Programme include:

- Students will proficiently navigate and utilize the Windows operating system, including tasks such as managing files and folders, customizing the desktop, and using system tools.
- Students will develop foundational skills in using common office software, including word processing for creating and formatting documents, spreadsheet software for data entry and basic analysis, and presentation software for creating multimedia presentations.
- Students will gain an understanding of essential concepts in computer security, including data backup, and ethical considerations in computing, ensuring responsible and safe computer usage.
- Students will effectively use web browsers to access information on the internet.
- Students will proficiently send emails, manage contacts, and engage in online communication, forums, and discussions.
- Students will cultivate a strong awareness of ethical considerations in computing, emphasizing responsible and safe computer usage.

Course Outcomes: On completion of the course, learner will be able to

CO1: Define the fundamental components of a computer, including the CPU, input and output units, and various memory devices.

CO2: Gain comprehensive knowledge of computing history, computer classifications, operating system functions and types, and proficiency in word processing and presentation skills using MS-Word and MS-PowerPoint.

CO3: Develop essential computing skills, including proficiency in Microsoft Office applications, effective email management, and efficient navigation of the Windows operating system.

CO4: Analyze the multifaceted components of operating systems, including process, file, and security management, while also assessing the diverse applications of Information and Communications Technology across various fields.
CO5: Assess how various computer generations have shaped the evolution of technology, compared their characteristics and impact, and explored how they have influenced industries and daily life.
CO6: Create a captivating multimedia presentation showcasing the history of computer operating systems. Use visuals and narratives to highlight key milestones from command-line interfaces to modern graphical systems, emphasizing their importance in computing.

Course Contents

Unit 1	**Foundations and Components of Computing**	**(2 Hrs)**
Definition of Computers, History and Generations of Computers, Computer Peripherals, Characteristics of Computers, Classification of Computers. Fundamental Block diagram of Computer: CPU, Input and Output Unit. Various Input Devices, Various Output Devices, Memory Devices like USB, CD, DVD, Hard Disk, Floppy Disk. Organizing a Computer System, Hardware, Software, Applications of Information and Communications Technology.		
Unit 2	**Overview of Operating Systems**	**(2 Hrs)**
Operating System, Definition and Function of Operating Systems, Evolution of Operating System, Types of Operating System, Different Components of Operating System – Process Management, File Management, Network Management, Main Memory Management, Secondary Storage Management I/O Device Management, Security Management		
Unit 3	**Navigating Computers**	**(2 Hrs)**
The Graphic User Interface (GUI), Using Mouse; Using Right and Left Buttons of the Mouse, Knowing About Keyboards and Shortcut Keys, Moving Icons on the screen, Use of Common Icons, Status Bar, Using Menu and Menu-selection, Running an Application, Viewing of File, Folders and Directories, Creating and Renaming of Files and Folders		
Unit 4	**Windows Basics: From Desktop to Web Browsing**	**(2 Hrs)**
Introduction to Windows, Starting Windows, Desktop, Task Bar, Start Up Menu Working with Programs, and Icons-Adding, Removing, Starting, and Quitting Programs and Icons**,** Working with Files and Folders - Creating, Deleting, Opening, Finding, Copying, Moving, and Renaming Files and Folders**,** Control Panel, Setting, My Computer, Recycle Bin, My Documents, Drives, Windows Notepad, Accessories, and Microsoft Edge.		
Unit 5	**Essential of MS-Word and MS-PowerPoint**	**(2 Hrs)**
MS-Word: Overview of Word Processing, Types of Menus, Opening, Creating Saving, Cut, Copy, Paste, Print, Print Preview, Find, Replace, Header, Footer, Save, Save As, Borders, Shading, Bullets, Numbering, Spelling, Grammar, Word Count, Mail Merge, Table Handling and Important Shortcut Keys, Macros. MS-PowerPoint: Overview of MS-PowerPoint, Slides, PowerPoint Views, Auto Content Wizard, Custom Animation, Transition and Build effects, Printing slides and Important Shortcut Keys.		
Unit 6	**An Introduction to MS-Excel and E-Mail**	**(2 Hrs)**

MS-Excel: Create Worksheets and Workbooks, Apply Custom Data Formats and Layouts, Create Tables, Perform Operations with Formulas and Functions, Create Charts and Objects, Apply Custom Data Formats and Layouts, Manage Workbook Options and Settings.

E-Mail: Electronic Mail, creating a Mail ID/Account, Composing a Mail, Formatting a Mail, Attachments, Searching, Inbox, Conversations, Reply, Labels, Filters, Sending a Mail, Spam, Trash, Gmail, General Settings, etc.

Learning Resources

Reference Books:

1. “Computer Fundamentals” by P.K. Sinha.
2. “Computer Fundamentals” by D. P. Nagpal.
3. “Fundamentals of Computers” by Rajaraman V and Adabala N.
4. “Fundamentals of Computers” by Reema Thareja.

JSPM University Pune

F.Y. B.Sc. Forensic Science

Semester I

Course Type: AEC	**Course Title: Effective Communication Skills**	
Course Code: 230UENB01_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 1** **Tutorial (T): 0** **Practical (P): 2** **Experiential Learning (EL): 0**	**Theory (TH): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- **Remember** key facts and concepts of communication skills.
- **Understand** the theories, fundamentals, and tools of communication.
- **Apply** basic language skills – listening, speaking, reading, and writing.
- **Analyze** functional grammar and language for professional usage.
- **Evaluate** the communication strategies used in case studies or real-world scenarios.
- **Create** social awareness.

Course Outcomes: On completion of the course, learner will be able to

CO1: Remember basic language skills- listening, speaking, reading, and writing and attempt tasks by using functional grammar and vocabulary effectively.
CO2: Reproduce their understanding of concepts / principles of communication skills.
CO3: Apply grammatical rules in professional communication.
CO4: Analyze professional content with effective listening and reading skills.
CO5: **Evaluate** the social scenarios and present themselves effectively.
CO6: Create socially aware personalities.

Course Contents

Unit I	Foundation of Communication	(2 Hrs)

Meaning, Definition, Scope, and Importance of Communication, Process and Types of Communication, Channels of Communication, Barriers to Effective Communication and ways to mitigate

Unit II	Language Competency	(2 Hrs)

Basic rules of Tenses, Rules of Phonics, Diagraph, Trigraphs, Consonant blends and silent consonants, Construction of multi syllabic words

Unit III	Active Listening	(2 Hrs)

Differentiating Active listening from Passive listening, Recognizing and overcoming common barriers to Active listening, Role of Active listening in professional interactions and conflict

resolutions, Summarize and Analyze the content of broadcasts		
Unit IV	**Effective Speaking**	**(4 Hrs)**
Identifying common fears and anxieties related to speaking, Techniques to build confidence and overcome stage fright, Voice modulation, pitch, and pace for engaging delivery, Impromptu Speaking		
Unit V	**Skillful Reading**	**(2 Hrs)**
Learning active reading techniques like Intensive Reading, Extensive reading Skimming and Scanning, identifying main ideas, supporting details, and drawing inferences, Strategies for vocabulary building and context-based understanding, Comprehensive Reading-Practical		
Unit VI	**Comprehensive Writing**	**(3 Hrs)**
Learning Sentence Structure essentials, Professional Email writing- Salutations, subject line, greeting, body, closing line, and signature, Memo, Notice and Agenda, Minutes of Meeting, Letter Writing: Formal Letter, Informal Letter, Business Letter, Job Application Complaint Letter and Leave Application		
Learning Resources		
Textbooks: 1. Meenakshi Raman, "Technical Communication Principles and Practice", Oxford University Press Fourth Edition May 2022		
Reference Books: 1. Veerendra Mishra, "English Language Skills: A Practical Approach Cambridge University Press, 2020.		
MOOC / NPTEL Courses: 1. NPTEL Course "Communication Skills" Dr. T. Ravichandran, IIT Kanpur **Link of the Course**: https://archive.nptel.ac.in/courses/109/104/109104031/ **Additional Web Resources**: https://www.britishcouncil.in/english/online/resources-websites/moocs		

JSPM University Pune F.Y. B.Sc. Forensic Science Semester I		
Course Type: AEC	**Lab Course Title: Effective Communication Skills**	
Course Code: 230UENB01_01	**Teaching Scheme:**	**Examination Scheme:**
Credits: 2	**Lecture (L): 1** **Tutorial (T): 0** **Practical(P): 2** **Experiential Learning (EL): 0**	**Theory (TH): 50 Marks**
Prerequisite Courses, if any: - Nil		

List of Laboratory Experiments	
Group A	
1.	Presentation Skills
2.	Tenses
3.	Phonics
4.	Listening Skills
5.	Speaking Skills
Group B	
6.	Group Discussion
7.	Impromptu Speech
8.	Reading Skills
9.	Letter Writing
10.	Email Writing
Virtual LAB Links:	

JSPM University Pune

F.Y. B.Sc. Forensic Science

Semester I

Course Type: IKS	**Course Title: States in Ancient India**	
Course Code: 230UHIB01_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 2** **Tutorial (T): 0** **Practical (P): 0** **Experiential Learning (EL): 0**	**Theory (TH): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- Acquaint students with Ancient Polity.
- To understand Governing structures prevailing in Ancient India.

Course Outcomes: On completion of the course, learner will be able to -

CO1: Students will understand the role of executives in the functioning of the State.

CO2: Able to understand working of different branches of Administration during Ancient India.

CO3: Understand the notion of state in Ancient India and its characteristic features

CO4: Distinguish the modern state from the more ethical forms of state in Ancient India

CO5: Able to think about abstract political structures and draw understandings

CO6: Make correlation between the past and present societies.

Course Contents

Unit I	**Categories**	**(2 Hrs)**
Notion of Indian Knowledge system, Nature and Scope of Panchatantra, Concepts in History State, Ancient India		
Unit II	**Early Instance of State**	**(2 Hrs)**
Background, Early History, State in the First Urban Civilization, Harappa, Mohenjo-Daro		
Unit III	**Vedic Polity**	**(7 Hrs)**
Institutions: Vidatha, Sabha and Samiti, Role scope functions and nature of the institutions, Significance of Rajan, Kula-Visha, Jana, Change from family and tribe to Kingship.		
Unit IV	**Territorial Kingdoms**	**(3 Hrs)**
Mahajanpada, Factors of State, Role of Territory, Types of Taxes during ancient Times, Tax (Bhaga), Tax as an instrument of Power and income for State		

Unit V	Mauryan State	(7 Hrs)
The Arthashastra, Treatises on State Craft- Saptanga Theory of State, Role of Espionage System. Provincial and Local Administration, Positions of Amatyas and Kumar-Amatyas, Committees for Local Administration		
Unit VI	**Gupta State**	**(7 Hrs)**
Divine Theory of Kingship, Role of Land, Role of Religion in State-Devaputra, Feudal Structure and its Literature		

Learning Resources

Textbooks:

1. Altekar A. S. 'State and Government in Ancient India', Motilal Banarasidas Publishers, Varanasi, 1949
2. Jha D. N., 'Early India: A Concise History' Manohar Publication, New Delhi, 2010

Reference Books:

1. Sharma Ram Sharan., Aspects of Political ideas and Institutions in Ancient India., Munshiram Manoharlal
2. Kautilya's Arthshastra, Penguin Publication, 1992
3. Raychaudhari Hemchandra, 'Political History of Ancient India', University of Calcutta, Calcutta,1923.
4. Thapar R., 'Early India: From the Origins to A.D. 1300', Penguin Books, 2002

MOOC / NPTEL Courses:

1. Swayam Course Indian Knowledge System(IKS): Humanities and Social Sciences course, by Prof. B. Mahadevan, Dr. Vinayak Rajat Bhat, Dr. R Venkata Raghavan
Link of the Course: https://swayam.gov.in/explorer?searchText=iks

JSPM University Pune

F.Y. B.Sc. Forensic Science

Semester I

Course Type: VEC (HSMC)	**Course Title: Environment and Sustainability**	
Course Code: 230GCEB02_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 2** **Tutorial (T): 0** **Practical (P): 0** **Experiential Learning (EL): 0**	**Theory (TH): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

The specific objectives of the Programme include:

- This undergraduate course explores the fundamental concepts of environmental science, sustainability, and their interconnections.
- Students will gain an understanding of the complex issues surrounding environmental degradation and sustainable solutions.
- The course emphasizes critical thinking and problem-solving skills to address real-world environmental challenges.

Course Outcomes: On completion of the course, learner will be able to

CO1: Comprehend the environment's components and historical human-environment interactions comprehensively.

CO2: Analyze ecosystems, recognize biodiversity's importance, and propose conservation strategies.

CO3: Identify pollution types, explore remediation strategies, and understand the shift to renewable energy and sustainable resource management.

CO4: Gain knowledge in climate science, comprehend climate change impacts.

CO5: Grasp the concept of sustainability, and its practical application in addressing global environmental challenges.

CO6: Explore environmental policy development, engage in actions towards sustainability.

Course Contents

Unit 1	**Introduction to Environment and Sustainability**	**(5 Hrs)**
Definition of environment and its components, Environmental sustainability and its importance, Historical perspectives on human-environment interactions, Key environmental challenges and global environmental issues		
Unit 2	**Ecosystem and Biodiversity**	**(5 Hrs)**

Ecosystem structure and function, Biodiversity and its importance, Threats to biodiversity and conservation strategies, Case studies in ecosystem restoration and preservation, Conservation strategies and sustainable solutions		
Unit 3	**Environmental Pollution**	**(5 Hrs)**
Air and water pollution, Soil contamination and remediation, Fossil fuel consumption and renewable energy sources, Sustainable resource management		
Unit 4	**Climate Change and Global Sustainability**	**(5 Hrs)**
Climate change and global warming**,** Impacts of climate change on ecosystems and societies, Mitigation and adaptation strategies, International agreements and policies related to climate change.		
Unit 5	**Sustainable Living and Consumer Choices**	**(5 Hrs)**
Sustainable lifestyles and consumption patterns, Green technology and sustainable design, Food systems and sustainable agriculture, Sustainable transportation and urban planning		
Unit 6	**Environmental Policy and Action**	**(5 Hrs)**
Environmental policy development and implementation, Environmental activism and advocacy, Corporate sustainability, and CSR (Corporate Social Responsibility), The role of individuals and communities in sustainability		

Learning Resources

Text Books:

1. Richard T. Wright and Dorothy F. Boorse, “Environmental Science: Toward a Sustainable Future”, Benjamin-Cummings Pub Co,13th Edition.
2. Tom Theis and Jonathan Tomkin, “Sustainability: A Comprehensive Foundation”, OpenStax CNX,

Reference Books:

1. David A. Anderson, “Environmental Economics and Natural Resource Management”, Routledge, 5th Edition.
2. R. S. Khoiyangbam and N. Gupta, “Introduction to Environmental Sciences” (2015)

MOOC / NPTEL Courses:

1. NPTEL Course “ENVIRONMENT & ECOLOGY”, Prof. Anuradha Sharma and Prof. V. Upadhyay, IIT Delhi. Link of the Course: https://gndec.ac.in/~librarian/web%20courses/IIT-Delhi/Environment%20and%20Ecology/
2. Swayam course “Environmental Science”, Prof. Sudha Goel, Prof. Shamik Chowdhury, IIT Kharagpur.

JSPM University Pune F.Y. B.Sc. Forensic Science Semester I		
Course Type: LC	**Course Title: Crime Scene Investigation and Evidences Lab**	
Course Code: 230HFSB04_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 0** **Tutorial (T): 0** **Practical (P): 4** **Experiential Learning (EL): 0**	**Practical (PR): 50 Marks** **Oral (OR): 50 Marks**
Prerequisite Courses, if any: Nil		

List of Laboratory Experiments	
Group A	
1.	To protect a given crime scene.
2.	To perform crime scene photography.
3.	To perform videography of a crime scene.
4.	To perform crime scene sketching.
5.	To collect various evidences from the scene of the crime.
Group B	
6.	Packaging and forwarding of physical evidences.
7.	To reconstruct the given crime scenes.
8.	To compare soil samples.
9.	To compare and calculate diameter of given bangle piece.
10.	To compare cloth samples by physical matching.
Group C	
11.	To study and classify lip prints.
12.	Examination of soil through a microscope.
13.	To study footprints on various surfaces.
14.	To study characteristics of various tires.
15.	Classify various blood spatter patterns.

JSPM University Pune

F.Y. B.Sc. Forensic Science

Semester I

Course Type: LLC	**Course Title: Human Anatomy and Physiology**	
Course Code: 230HFSB05_01	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 1.5	**Lectures (L): 0** **Tutorials (T): 0** **Practical (P): 2** **Experiential Learning (EL): 2**	**Practical (PR): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- To Make Students acquainted of Human Body and Physiology
- To understand functioning of different organs in body.

Course Outcomes: By the end of this course, students will be able to:

CO1: Describe the shape, parts, and jobs of different organs in the human body.
CO2: Explain how our body keeps things balanced and what happens when it does not.
CO3: Recognize different body parts in various systems.
CO4: Do experiments related to our senses and how our systems work.
CO5: Understand how different organs in our body work together.

Course Contents

Unit I	**Introduction to Human Body**	**(5 Hrs)**
Definition and scope of anatomy and physiology, Basic anatomical terminology, Levels of structural organization and body systems, basic life processes, Origin of life and theories of evolution, geological time scale.		
Unit II	**Introduction to Cell Biology**	**(6 Hrs)**
Cell - Discovery of cell, The cell theory, cell structure and functions, Cellular Organelles, transportation across cell membrane, cell division, Prokaryotic and eukaryotic cell.		
Unit III	**Skeletal System and Joints**	**(8 Hrs)**
Skeletal System – Introduction, Bone Structure, Types of bone, salient features, and functions of bones of axial and appendicular skeletal system, Physiology of muscle contraction, neuromuscular junction. Joints - Structural and functional classification, types of joint movements		
Unit IV	**Body Fluids**	**(5 Hrs)**
Different body fluids in humans, Blood, Semen, Saliva, Urine, sweat, etc. Composition of body fluids, functions, Forensic significance of body fluids		

Unit V	Blood Anatomy and Physiology	(6 Hrs)
Blood – Basics, Hematopoiesis, anaemia, Mechanisms of blood clotting, Blood grouping, Rh factors, transfusion, Significance and disorders of blood, Blood borne diseases.		
Unit VI	**Experiential Learning**	**(30 Hrs)**

I. Study of microscope and its parts.
II. Microscopic study of cell.
III. Study of human anatomy and different systems.
IV. Study of human skeletal system.
V. Identification of long and short bones in human body.
VI. Identification of axial bones.
VII. Identification of appendicular bones.
VIII. Microscopic study of blood.
IX. Preparation of blood smear and staining.
X. Identification of different kind of cells in blood.
XI. Determination of blood groups.
XII. Determination of Bleeding Time and Clotting Time
XIII. Determination of erythrocyte sedimentation rate (ESR).
XIV. Determination of heart rate and pulse rate.
XV. Recording of blood pressure.

Learning Resources

Reference Books:

1. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York
2. Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, GA, U.S.A.
3. Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma, Jaypee brother's medical publishers, New Delhi.
4. Human Physiology (vol 1 and 2) by Dr. C. C. Chatterjee, Academic Publishers Kolkata
5. Lehninger Principles of Biochemistry 5th ed. (2005): Nelson and Cox, W.H Freeman
6. Cell and molecular biology 3rd ed.: P.K Gupta, Rastogi publications
7. Cell Biology (1984): C. B. Powar, Himalaya Publications
8. Kuby's Immunology 6th ed.: Goldsby, Kindt, Osborne, W.H Freeman and company, New York
9. Human biology 5th ed.: Daniel Chiras, Jones and Bartlett publishers
10. Cell biology, Genetics, Molecular biology, evolution and ecology: P.S Verma, S. Chand and company

JSPM University Pune

F.Y. B.Sc. Forensic Science

Semester II

Course Type: PCC	**Course Title: Forensic Fingerprints**	
Course Code: 230HFSB07_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 3	**Lecture (L): 2** **Tutorial (T): 0** **Practical (P): 2** **Experiential Learning (EL): 0**	**Theory (TH): 100 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- To make students understand the significance of fingerprints one of the most important pieces of evidence to identify an individual.
- To make students acquainted with the patterns and types of fingerprints which are helpful to enhance, compare and analyze the fingerprints.

Course Outcomes: Students completing the course will be able to:
CO1: Aware with the history and development of fingerprints.
CO2: Understand the principles and significance of fingerprints in Forensics.
CO3: Explain the anatomy and morphology of fingerprints.
CO4: Identify the various patterns of fingerprints.
CO5: Demonstrate an ability to record the fingerprints.
CO6: Classify the fingerprints based on different classification system.
CO7: Identify the type of fingerprints found at crime scenes with their composition.
CO8: Demonstrate an ability to enhance the fingerprints found on different crime scenes.
CO9: Classify the palm prints and sole prints found on crime scenes.

Course Contents

Unit I	**Introduction to Fingerprints**	**(7 Hrs)**

Definition: Dactylography, Dermatoglyphics, Dactyloscopy, Fingerprint, Friction skin, History and development of fingerprints, Scientific basis for persistence and uniqueness of fingerprints (Principles and significance), Anatomy of human skin – Epidermis, Dermis and Hypodermis, Embryology and Morphology of friction ridge skin (primary and secondary ridge formation, volar pad development, differentiation of friction ridge skin), Theory of pattern formations

Unit II	**Fingerprint Patterns and their Recording**	**(7 Hrs)**

Fingerprint patterns and related terms: Delta, pattern area, type lines, core (ridge characteristics), Ridge counting and Ridge tracing, Recording of fingerprints: Rolled and plain impression, Recording of fingerprints of mutilated/damaged fingers and of dead		
Unit III	**Classification System of Fingerprints**	**(8 Hrs)**
Classification system: Johannes Purkinje classification, Tripartite classification, Henry's classification, Henry-FBI classification system of fingerprints, Single digit classification of fingerprint, NCIC classification		
Unit IV	**Types and Composition of Fingerprints**	**(8 Hrs)**
Types of fingerprints at the crime scene: patent, plastic, and latent prints, Sweat glands, the composition of sweat, and its role in fingerprint development, Secretory glands: Eccrine (Inorganic, Organic etc.), Sebaceous (Fatty acids, Phospholipids, Wax esters, Sterols, Squalene etc.) and Apocrine. Variation of secretion with age, Composition of Latent Print residue by different agencies		
Unit V	**Fingerprint Enhancement Techniques**	**(7 Hrs)**
Methods of Development of latent fingerprints using conventional methods– Powdering (Black and grey, fluorescent and magnetic), Chemical fuming and enhancement (Iodine Fuming, Cyanoacrylate Fuming), Amino acid-based reagents method (Ninhydrin method, DFO Method), Silver nitrate method, Enhancement of bloody fingerprints, Various factors influencing the development of fingerprint, Lifting of fingerprints		
Unit VI	**Palm Prints and Soleprints**	**(8 Hrs)**
Palm print classification system - Cumins and Midlo classification, Chatterjee classification, Soleprint classification system – Chatterjee classification, Poroscopy, Edgeoscopy		

Learning Resources

Reference Books:

1. Hawthorne, Mark R., Fingerprints: analysis and understanding, CRC Press, 2009.
2. Henry C. Lee and R.E. Gaensslen, Advances in fingerprint technology, Second Edition, CRC Press, 2001.
3. Marzena Mulawka, Postmortem Fingerprinting, and Unidentified Human Remains, Elsevier, 2014.
4. Christophe Champod, Chris Lennard, Pierre Margot, And Milutin Stoilovic, Fingerprints, and Other Ridge Skin Impressions, CRC Press, 2004.
5. Eric H. Holder, Jr., Laurie O. Robinson, and John H. Laub, The Fingerprint Sourcebook, US Department of Justice, 2009.
6. Saferstein, R. (1990) Criminalistics, Prentice Hall, New York.
7. David R. Ashbaugh (1999) Quantitative and Qualitative Friction Ridge Analysis, CRC Press.
8. E. Roland Menzel (1999) Fingerprint Detection with Lasers, 2nd Ed., Marcel Dekker, Inc. USA.
9. James F. Cowger (1993) Friction Ridge skin, CRC Press London.
10. Mehta, M.K (1980) Identification of Thumb Impression & Cross Examination of Finger Prints, N.M. Tripathi Pub. Bombay.

11. Moenssens (1975) Finger Prints Techniques, Chitton Book Co. Philadelphia, NY.
12. Chatterjee S.K. (1981) Speculation in Finger Print Identification, Jantralekha Printing Works, Kolkata.
13. Cowger, James F (1993) Friction ridge skin- Comparison and Identification of fingerprints, CRC Press, NY.
14. J A Siegel, P.J Saukko (2000) Encyclopedia of Forensic Sciences Vol. I, II and III, Acad. Press.
15. Cummins & Midlo : Finger Prints, Palms and Soles, 1943, The Blakiston office London.
16. Allison: Personal Identification.
17. Chatterjee S.K. and Hagne R.V. (1988) : Finger Print or Dactyloscopy and Ridgeoscopy.
18. The Science of Fingerprints. Federal Bureau of Investigation. Rev. 12-84 by U.S. Government Printing Office Washington D.C.
19. Bailey's Textbook of Histology 16th Edition pg. 366 – 377.
20. Poroscopy, Identification News November 1982. D.R. Ashbaugh CPL pg 3-8.
21. Ridgeology, Journal of forensic Identification. 16/41 (1) 1991 by David R. Ashbaugh.

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: PCC	**Course Title: Instrumental Methods of Analysis**	
Course Code: 230HFSB08_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 2 Tutorial (T): 0 Practical (P): 0 Experiential Learning (EL): 0**	**Theory (TH): 100 Marks**
Prerequisite Courses, if any: Nil		
Course Objectives: To make students understand 1. Concepts from general chemistry, organic chemistry, and quantitative analysis to understand methods of instrumental analysis and reproducible data analysis. 2. Summarize the theoretical bases of common analytical techniques, including spectroscopic, spectrometric, and separation methods. 3. Select appropriate instrumental methods for a given analyte, sample matrix, and detection regime.		
Course Outcomes: On completion of the course, learner will be able to **CO1:** Gain knowledge regarding atomic structure, periodic properties, chemical bonding, fundamentals of organic chemistry and states of matter. **CO2:** Understand the need for advanced instrumentation techniques. **CO3:** Understand different techniques for identification, characterization & quantification of forensic exhibits. **CO4:** The basic concept of EMR and its application in forensic analysis. **CO5:** Comprehend the significance of wave and quantum properties of EMR. **CO6:** Summarize the theoretical bases of common analytical techniques, including spectroscopic, spectrometric, and separation methods. **CO7:** Understand the principles & working of spectroscopic techniques used for analysis of forensic specimens. **CO8:** Comprehend the principle, instrumentation, and applications of separation techniques. **CO9:** Understand the principle and applications of bioanalytical techniques.		
Course Contents		
Unit I	**Atomic Structure and Bonding**	**(6 Hrs)**

Atomic Structure: History, Periodical properties, atomic orbitals, de Broglie concept - Dual nature of matter. Molecular Structure: The general idea of modern periodic table, atomic and ionic radii, ionization potential, electron affinity, electronegativity. Chemical Bonding: Ionic bond, covalent bond - Valence Bond Theory and its limitations; States of Matter: Gaseous State-Postulates of kinetic theory of gases, deviation from ideal behavior, van der Waal's equation of states. Liquid State-Intermolecular forces, Structural differences between solids, liquids and gases. Physical properties of liquids including their methods of determination: surface tension, viscosity.

Unit II	**Introduction to Instrumentation**	**(4 Hrs)**

Meaning and Terminology of Instrumentation: Definition, Need of Instrumentation in Forensic Science, Qualitative and quantitative methods of analysis, Destructive and Non-Destructive Methods, Separatory techniques, Hyphenated techniques, Accuracy, Precision, Signal to noise ratio, Sensitivity and detection limit, sources of noise, Instrument Calibration, Standard Protocols of Handling Instruments (SOPs).

Unit III	**Spectroscopy**	**(6 Hrs)**

Spectroscopy, Electromagnetic Radiation, Phenomena of Emission, Absorption, Reflection, Fluorescence, Phosphorescence. Electromagnetic radiation (EMR): Introduction, types of EMR, wave and quantum properties of EMR, Atomic and Molecular spectra, UV-Visible Spectroscopy: Principle, instrumentation and Forensic applications.

Unit IV	**Separation Techniques - I**	**(6 Hrs)**

Chromatography: History, Introduction, Definition, Principles of Chromatographic techniques, Classification of Chromatographic Methods, Adsorption and Partition Chromatography, Application of different Chromatographic Methods in Forensic Science. Paper Chromatography: Principle, types, instrumentation, and forensic applications.

Unit V	**Separation Techniques - II**	**(4 Hrs)**

Thin Layer Chromatography: Basic Principle, Setup, visualization and Forensic applications etc. HPLC: Basic Principle, Instrumentation and Forensic applications. GC: Basic Principle, Instrumentation and Forensic applications.

Unit VI	**Microscopy**	**(4 Hrs)**

Microscopy: History, Introduction, Theory, Basic Principles, Setup and Forensic Applications of Simple, Compound, Polarized, Stereo and Comparison Microscopes.

Learning Resources

Reference Books:

1. Kemp, W. Organic Spectroscopy 3rd ed. PALGRAVE: New York; (1991).
2. Willdard, H.H., Merritt, L.L. and Dean, J.A. Instrumental Methods of Analysis 5th ed. Var Nostrand:New York; (1974).
3. Lundquist, F. and Curry, A.S. Methods of Forensic Science. Inderscience: California; (1963).
4. Settle, F.A. Handbook of Instrumental Techniques for Analytical Chemistry. Prentice Hall: (1997).
5. Stahl, E. Thin Layer Chromatography: A Laboratory Handbook. Springer: Berlin; (1969).
6. Jickells, S. and Negrusz, A. Clarke's Analytical Forensic Toxicology. Pharmaceutica Press: (2008).
7. Houck, M.M. Fundamentals of Forensic Science. Academic Press: (2015).

8. Skoog, D.A., West, D.M. and Holler, F.J. Fundamentals of Analytical Chemistry 6th ed. Saunders College Publishing: (1996).
9. Robinson, J.W. Undergraduate Instrumental Analysis. Marcel Dekker: New York; (1987).
10. Chatwal, G.R. and Anand, S.K. Instrumental Methods of Chemical Analysis 5th ed. Himalaya Publishing: Bombay;(2019).

JSPM University Pune

F.Y. B.Sc. Forensic Science

Semester II

Course Type: PCC	**Course Title: Criminal Justice Administration**	
Course Code: 230HFSB09_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 2** **Tutorial (T): 0** **Practical (P): 0** **Experiential Learning (EL): 0**	**Theory (TH): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- By the end of this course, students will have a deep understanding of the foundational components of the Indian criminal justice system.
- Students will gain insight into the Constitutional and Legal Framework for Criminal Justice.
- This course aims to equip students with the knowledge and skills required to navigate key legal codes and procedures.

Course Outcomes: Students completing the course will be able to:

CO1: Students will be able to recall and describe key concepts and components of the Indian criminal justice system and relevant legal codes.
CO2: Students will apply legal provisions and judgments to analyze criminal cases and procedural aspects.
CO3: Students will evaluate the impact of landmark judgments and assess challenges and reforms in the Indian criminal justice system.
CO4: Students will engage in critical thinking to address contemporary issues and propose solutions.
CO5: Students will use problem-solving skills to address deficiencies in the criminal justice system.
CO6: Students will understand and apply ethical principles in the practice of criminal justice administration.

Course Contents

Unit I	**Foundations of Criminal Justice Administration**	**(5 Hrs)**

Crime & Criminal Law, Models of Criminal Procedure, Indian Judicial System, Indian Constitution: Base of Criminal Justice System Law Enforcement Agencies – Police; Prosecution; Defense Counsel; Courts, Hierarchy of Courts, Power of Courts, Challenges and Reforms in the Indian Criminal Justice System, Landmark Judgements.

Unit II	**Constitutional Foundations**	**(5 Hrs)**

Fundamental Rights and their Relevance to Criminal Justice, Separation of Powers and Checks and Balances in the Indian Constitution, Constitutional Provisions Related to the Protection of Civil Liberties and Human Rights, Case Studies on Landmark Constitutional Judgments Affecting Criminal Justice.

Unit III	**Indian Penal Code**	**(5 Hrs)**

Understanding The Indian Penal Code, 1860; Historical Context, Structure of the IPC, Major Crimes, Case Studies & Landmark Judgements in Indian History, Introduction of The Bharatiya Nyaya Sanhita, 2023.

Unit IV	**Criminal Procedure Code**	**(5 Hrs)**

Overview of The Criminal Procedure Code, 1973, Inquest: Police Inquest & Magistrate Inquest, Procedural Aspects of Criminal Trials, Arrest Process, Rights of Arrestee, Court Proceedings, Evidence, and Appeals, Introduction of The Bharatiya Nagarik Suraksha Sanhita, 2023

Unit V	**Indian Evidence Act**	**(5 Hrs)**

Familiarizing The Indian Evidence Act, 1872; Concepts of Admissibility and Relevancy of Evidence, Types of Evidence and their Legal Significance, Expert Testimony and Forensic Evidence in Court, Introduction of The Bharatiya Sakshya Adhiniyam, 2023.

Unit VI	**Criminal Justice Evolutions**	**(5 Hrs)**

Emerging Trends and Challenges in Indian Criminal Justice Administration, Cybercrime, and implications on Criminal Justice Administration, Overviews of: IT Act, 2000; Juvenile Justice (Care and Protection of Children) Act, 2015, POCSO Act, 2012; POSH Act, 2013.

Learning Resources

Reference Books:

1. "Introduction to the Judicial System of India" by B.N. Kirpal.
2. "Criminal Law: The Basics" by Herring, J.
3. "Challenges in the Criminal Justice System in India" by M. Patel.
4. "Landmark Judgments that Changed India" by Asok Kumar Ganguly.
5. "Ratanlal & Dhirajlal's Indian Penal Code" by K.D. Gaur.
6. "Criminal Procedure Code" by R.V. Kelkar
7. Indian Penal Code, 1860 - Bare Act.
8. Criminal Procedure Coe, 1973 – Bare Act.
9. Indian Evidence Act, 1872 – Bare Act.
10. "Indian Cyber Law & Cyber Crime" by Rohas Nagpal.

MOOC Course:

1. Criminal Justice Administration - https://onlinecourses.swayam2.ac.in/cec21_lw04/preview
2. Crime and Administration of Criminal Justice in India - https://www.udemy.com/share/109P66/

Modules:

Link: https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/344

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: MMC	**Course Title: Essentials of Programming Languages**	
Course Code: 230HFSB10_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 1** **Tutorial (T): 0** **Practical (P): 2** **Experiential Learning (EL): 0**	**Practical (PR): 50 Marks** **Oral (OR): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives: Upon completion of the course, the students will be able to -

- Understand the Programming Language Fundamentals.
- Gain proficiency in Basic Elements of Programming.
- Learn to employ various utilities in in programming tasks.
- Apply/Implement variety of statements in programming.
- Gain practical experience in handling different functions effectively for modular programming.
- Develop practical programming skills by creating programs on their own.

Course Outcomes: Students completing the course will be able to:

CO1: Remember and tell apart the main ideas in programming languages like Procedure Oriented Language and Object-Oriented Language.

CO2: Know and separate Machine Level, Assembly Level, and High-Level Programming, understanding their basic concepts.

CO3: Explain and understand what variables, constants, and data types are in programming and how they work.

CO4: Understand and show how different symbols (+, -, etc.) and rules in programming are used to change information and manage how a program runs.

CO5: Use and demonstrate various types of instructions in programming (like simple steps, choices, and repeating tasks) to solve problems in programs.

CO6: Apply arrays, strings, and functions in programming to make and control groups of information, using the right way of writing and thinking.

Course Contents

Unit I	**Foundation to Programming Languages**	**(3 Hrs)**

Programming Languages, Procedure Oriented Language, Object Oriented Language, Concepts of Machine Level, Assembly Level and High-Level Programming, Flow charts and Algorithms, Areas of Programming		
Unit II	**Constant, Variables and Data**	**(5 Hrs)**
Introduction, Character Set, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Assigning Values to Variables, Defining Symbolic Constants, I/O functions		
Unit III	**Operators and Expressions**	**(5 Hrs)**
Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operator, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions		
Unit IV	**Statements**	**(5 Hrs)**
Simple Statements, Decision Making Statements, Nested Statements, Looping Statements, Nesting of Control Structures, Break and Continue Statement, Goto statement		
Unit V	**Array, String and Functions**	**(5 Hrs)**
Array, One Dimensional Array, Multi-Dimensional Array, String, Concepts, String Input / Output Functions Functions, Need for Functions, Definition of Functions, Elements of User-defined Functions, Return Values and their Types, Function Calls, Function Declaration		
Unit VI	**Practical based on Programming**	**(7 Hrs)**
Basic Introduction to C program and Turbo C Setup (Compile/Run Programs), Simple Programs, Programs using Operators, Programs using Conditional Statements, Programs of Loop Statements, Programs using Array, Programs using String, Programs using Functions		

Learning Resources

Reference Books:

1. Yashavant P. Kanetkar, “Let Us C”, 16th Edition, 2019, BPB Publications
2. Kernighan B.W and Dennis M. Ritchie, “The C Programming Language”, 2nd Edition, 2015, Pearson Education India
3. Pradip Dey, Manas Ghosh, “Programming in C”, 2nd Edition, 2018, Oxford University Press, ISBN: 978-01-9949-147-6.
4. Jacqueline A Jones and Keith Harrow, “Problem Solving with C”, Pearson Education
5. Dr. Guruprasad Nagraj, “C Programming for Problem Solving”, Himalaya Publishing House
6. Absolute Beginner's Guide to C, Greg M. Perry, Edition 2, Publisher: Sams Pub., 1994.
7. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.

MOOC Course:

1. Problem Solving through Programming in C - https://nptel.ac.in/courses/106105171
2. Art of C Programming - https://onlinecourses.swayam2.ac.in/cec24_cs05/preview
3. C Programming and Assembly Language - https://nptel.ac.in/courses/106106210

Web Material:

1. http://www.programmingsimplified.com/c-program-examples
2. http://lms.vtu.ac.in/econtent/web/BS/15PCD23/index.php
3. https://www.atnyla.com/syllabus/c-programming-language/1

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: MMC	**Course Title: Biomolecules**	
Course Code: **230HFSB11_02**	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 1** **Tutorial (T): 0** **Practical (P): 2** **Experiential Learning (EL): 0**	**Practical (PR): 50 Marks** **Oral (OR): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- To offer detailed knowledge of biomolecules for living systems.
- To provide basic concepts of structural organization and characterization of proteins.
- To learn about Oligosaccharides and lectin interactions in biochemical processes.
- To acquire knowledge on physicochemical properties and characterization of fats and oils.
- To understand the structure of DNA and RNA and their types.

Course Outcomes:

CO1: Students will acquire an insight into various biomolecules which constitute the living organisms
CO2: Students will learn the structure and properties of carbohydrates, proteins, lipids, DNA, RNA, glycoproteins, glycolipids and their importance in biological systems
CO3: Understand the role of sugars in energy production and living systems
CO4: Apply the link between the structure and functions of proteins in biological context
CO5: Analyze the role of lipids and apply the techniques to identify their purity

Course Contents

Unit I	Carbohydrate	(4 hrs)

Introduction to Biomolecules, function, diversity, and distribution, Carbohydrates: Classification, Physicochemical properties; Chemistry, Biological roles, and Structural elucidation of polysaccharides - homo and heteropolysaccharides, Proteoglycans, Glycoproteins and Glycolipids, Oligosaccharides - Lectin interactions in biochemical processes

Unit II	Lipids	(2 hrs)

Lipids: Classification; Structure, Properties and Biological roles of Phospholipids and Sphingolipids; Fatty acids and their physicochemical properties; Fats and Waxes; Structure, Properties and functions, Chemistry and Properties of Sterols and Steroids – Bile acids and Bile salts.

Unit III	**Amino acids**	**(3 hrs)**

Amino acids: Structure, classification, peptide bond. Proteins, Biological importance, primary structure, Secondary, tertiary, and quaternary structures, Proteinaceous and non-proteinaceous, Essential, and non-essential amino acids, Introduction to biologically active peptides

Unit IV	**Nucleic acids**	**(4 hrs)**

Nucleic acids - Purine and Pyrimidines – structure and properties, Nucleosides. Nucleotides, structure of nucleosides and nucleotide, Structure of DNA and different types of DNA, Watson and crick model for DNA, Structure of RNA and different types of RNA, Introduction Central Dogma of Life.

Unit V	**Vitamins**	**(2 hrs)**

Structure of fat-soluble vitamins A, D, E & K. Water soluble vitamins, their co- enzyme forms and deficiency disorders, Thiamine, Riboflavin, Pantothenic acid, Niacin, Pyridoxine, Biotin, Cobalamine, Folic acid and Ascorbic acid

Unit VI	**List of Laboratory Experiments**	**(15 hrs)**

I. Qualitative analysis of carbohydrates by the Fehling's test.
II. Qualitative analysis of carbohydrates by the Seliwanoff's test.
III. Estimation of protein by Biuret method
IV. Test for detection of Lipids
V. Test for detection of Proteins
VI. Test for Enzymatic hydrolysis of starch
VII. Extraction of DNA
VIII. Quantitative Estimation of Amino Acids by Ninhydrin

Learning Resources

Reference Books:

1. Text book of Biochemistry –E.S.West, W.R.Todd et al., 4th edition
2. Principles of Biochemistry by Lehninger –D.L.Nelson, M.M.Cox, 7th edition
3. Text book of Biochemistry with clinical correlations-Thomas M.Devlin, 7th edition
4. Harper's review of Biochemistry –D.W. Martin, 19th edition
5. Biochemistry – J.M.Berg, J.L.Tymockzo, L.Stryer, 5th edition
6. Biochemistry-Reginald H. Garret, Charles M.Grisham 6th edition

JSPM University Pune

F.Y. B.Sc. Forensic Science

Semester II

Course Type: SEC	**Course Title: Financial Literacy**	
Course Code: 230VBCB09_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 3	**Lecture (L): 2** **Tutorial (T): 0** **Practical (P): 2** **Experiential Learning (EL): 0**	**Practical (PR): 50 Marks** **Oral (OR): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives:

- To Evaluate the impact of financial decisions and practices on individuals and society.
- To Create effective financial plans and strategies to meet personal and household financial goals.

Course Outcomes: On completion of the course, learner will be able to

CO1: Understand the evolution and structure of the banking system in India.
CO2: Understand the various types of cheques.
CO3: Analyze and evaluate tax-saving investment schemes
CO4: Understand the importance of financial planning and the steps involved.
CO5: Apply knowledge of consumer protection and redressal mechanisms.

Course Contents

Unit I	**Banking**	**(6 Hrs)**
Definition of Bank, Evolution of Banking in India, Banking Structure, Types of Deposits and Accounts, KYC norms, Different Banking products and services offered by the banks, Electronic Banking		
Unit II	**Cheque and Types of Cheques**	**(6 Hrs)**
Meaning and Definition of Cheque, Types of Cheques, Precaution to follow while filling of cheque, Truncated cheque, Clearing process of cheque		
Unit III	**Tax Saving Schemes**	**(6 Hrs)**
Types of taxes, Tax rates, Tax planning v/s tax evasion, Tax saving investment - Government Schemes-National Saving Certificates, Public Provident Fund, Post Office Schemes, Equity Linked Savings Schemes, Retirement Benefits Schemes- NPS (New Pension System), Tax-free bonds		
Unit IV	**Personal Finance and Loss Protection**	**(6 Hrs)**

Financial Planning- Meaning, Household financial health check-up, Medical and other Emergencies, Retirement planning, Insurance Policies: Life and non-life Insurance		
Unit V	**Scams, Fraud Schemes**	**(6 Hrs)**
Insider trading, Money laundering, Cyber-crimes and types of cyber crimes, Consumer protection and redressal mechanism		
Unit VI	**Financial Calculation**	**(15 Hrs)**
Simple Interest, Compound Interest, Equated Monthly Installment, PMT, PPMT, IPMT, PV, FV, RATE, NPER		

Learning Resources

Text Books:

1) M. Jeff, Personal finance, Prentice Hall, 2016
2) T. R. Jain and R. L. Sharma, Indian Financial System, by, VK Global Publications Pvt. Ltd, 2014

Reference Books:

1) T. R. Jain and V. K. Ohri, Money and Banking, VK Global Publications Pvt. Ltd, 2020
2) S. Braunstein and C. Welch, Financial literacy: An overview of practice, research, and policy, Fed. Res. Bull, 2002
3) T. R. Jain and R. L. Sharma, Indian Financial System, by, VK Global Publications Pvt. Ltd, 2014
4) S. Cole and Gauri Kartini Shastry, Smart money: The effect of education, cognitive ability and financial literacy on financial market participation, Harvard Business School, 2009
5) Gitman, Joehnk and Billingsley, Personal financial planning, Cengage Learning, 2016
6) M. Jeff, Personal finance, Prentice Hall, 2016
7) Personal Finance Planning, Lewis J. Altest, Mc Graw. Hill. International Edition

Link of the Course:

1) www.rbi.org.in
2) www.incometax.gov.in

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: SEC	**Lab Course Title: Financial Literacy**	
Course Code: 230VCOB09_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 3	**Lecture (L): 2** **Tutorial (T): 0** **Practical(P): 2** **Experiential Learning (EL):0**	**Oral (OR): 50 Marks** **Practical (PR) : 50 Marks**
Prerequisite Courses, if any: - Nil		

List of Laboratory Experiments	
1.	Simple Interest
2.	Compound Interest
3.	EMI
4.	Loan Amortization Table
5.	Survey on Investment
6.	Visit to bank and collect the information of account opening form
7.	Filling out the different account opening form
8.	Identify the scams, fake messages, email in financial transaction
9.	Precaution to follow while filling of cheque.
10.	Case studies on scams in India
Virtual LAB Links:	

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: VSC	**Course Title: Design Thinking and Creativity**	
Course Code: **230IDCB01_01**	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 1.5	**Lecture (L): 1** **Tutorial (T): 0** **Practical (P): 0** **Experiential Learning (EL): 2**	**Oral (OR): 50 Marks**
Prerequisite Courses, if any:		
Course Objectives:		
Course Outcomes: On completion of the course, learner will be able to, **CO1:** Describe the Design thinking principles of Human Centered approach to real life problem solving **CO2:** Demonstrate through the project-oriented approach the basic theories and knowledge of design thinking and master the tools and principles of design thinking, and their application. **CO3:** Demonstrate through the project-oriented approach the basic theories and knowledge of design thinking and master the tools and principles of design thinking, and their application. **CO4:** Analysis of various applications of design thinking. **CO5:** Determine the suitable design thinking approach to solve the problem. **CO6:** Develop a low fidelity prototype of the alternative Solutions to the identified Problem.		
Course Contents		
Unit I	**Design Thinking Introduction**	**(3 Hrs)**
Introduction & definition of design thinking, Principles, the process, Innovation in design thinking, importance of design thinking method, the relationship between design thinking and innovation & entrepreneurship. Five step method of Design thinking (Empathize, Define, Ideate, Prototype, Test). Class Activity: Students are asked to form groups. Classroom Project begins: Share ideas with team members, discuss about meaning of DT, it's importance in today's world. Case: ABC Nightline- IDEO Shopping Cart, (the video can be shown in classroom for discussion.)		
Unit II	**Awareness of the five stages of design thinking, Empathize & Define**	**(5 Hrs)**
Introduction of the tools in the stage of empathy. Emphasize the skills and tactics of interviews. Understand the persona, Methods of collecting the data from interviews. The		

empathy map. Establishing the Problem statement using 5 Why's technique as a tool to understand the root cause. (Ex.26/11 attack, rescue team not able to move with ambulance due to stagnation) & Emphasis on establishing the "Problem Statement" only for faculty ref. Classroom Project: Each group will write the Problem Statement by using Stages of Empathy and technique of 5 Why's. Each group member will do the interview round for writing the problem statement. Take record of the interview process.

Unit III	**Ideate**	**(10 Hrs)**

Process to Find and select ideas, The creative process and creative principles, Creativity techniques, Evaluation of ideas. Idea Generation Stage-Fine tuning process of ideas (every team member comes up with 1 idea and passes on to next person, each idea will be fine-tuned by each team member and ultimately matured ideas are established- round robin method) and selection of best three ideas by voting method. Classroom Project: Through the project, students will know how to propose the point of view (POV) statement based on the analyses of data from user research via the brainstorm and others. Students are asked to submit ideas as many as possible. Note in POV practice: please define the problem which each group is finally going to resolve. The practice process: unpack the interview data, select one interviewee as analysis target and solution. Make inferences to generate ideas and POV statement. Please remember: No solution in the POV statement. (For faculty ref.: YouTube links for DT examples -How design thinking is transforming lives in rural India - https://www.youtube.com/watch?v=EH9u1bHqwpc Design Thinking in Netflix | | Case Studio - 04 - https://www.youtube.com/watch?v=8P8gspd_Bx8)

Unit IV	**Prototype & Test**	**(5 Hrs)**

Prototype and test stage, Prototype model, The role of prototype and test in the innovation and entrepreneurship. prototype and the way to test, visualization of ideas. Classroom project: groups design the prototype to show ideas about the innovative way to resolve the problem in the dormitory life. Concerning the test practice: Ask other group to visit your group and test your prototype, and then in turn.

Unit V	**Understanding Business Viability**	**(2 Hrs)**

Checking the Business viability of selected ideas derived in stage 3 using BXT model, Tools for the Design Journey, Pillars of Design thinking.

Unit VI	**Presentation and closure**	**(3 Hrs)**

The student groups will give the final presentation of the project they have done (Unit 1 to 5) and close the DT process.

Learning Resources

Text Books:

1. Design Thinking Methodology Book Paperback, ArtBizTech, Emrah Yayici, 2016.
2. Design Thinking for Strategic Innovation, by Idris Mootee, CEO Idea Couture, Wiley 2014

Reference Books:

1. "SL Schensul, JJ Schensul, MD LeCompte", (latest reprint) Essential Ethnographic Methods: Observations, Interviews, and Questionnaires: (Ethnographer's Toolkit), https://rowman.com/ISBN/9780759122017
2. Paddy Miller, Thomas Wedell-Wedellsborg, (2013), Innovation as Usual: How to Help Your People Bring Great Ideas to Life, HBR Press
3. Tim Brown, (2010), Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, HBR Press

4. “SL Schensul, JJ Schensul, MD LeCompte”, (latest reprint) Essential Ethnographic Methods: Observations, Interviews, and Questionnaires: 2 (Ethnographer's Toolkit), https://rowman.com/ISBN/9780759122017

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: AEC	**Course Title: Communicative Proficiency Skills**	
Course Code: 230UENMB02_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 1** **Tutorial (T): 0** **Practical(P): 2** **Experiential Learning (EL): 0**	**Theory (TH): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives: Course Objectives:

- **Recall** theory of communication for effective body language.
- **Understand** the importance of developing Public Speaking Skills and formulate thoughts effectively in the form of an effective Presentation.
- **Carry** reflexive or non-reflexive movements of the part or whole body.
- **Analyze** how sentences are built, learn to expand sentences, and learn tocombine short, choppy sentences into longer, grammatically correct sentences.
- **Evaluate** the most appropriate form in which to present information through socialmedia
- **Create** awareness about importance of professional behavior and suggest standards for appearance, actions, and attitudes in business Environment.

Course Outcomes: On completion of the course, learner will be able to

CO1: Recalling theory of communication for effective body language.

CO2: Understand the importance of developing Public Speaking Skills and formulate the thoughts effectively in the form of an effective Presentation.

CO3: Carrying reflexive or non-reflexive movements of the part or whole body.

CO4: Analyzing how sentences are built, learning to expand sentences, and learning to combine short, choppy sentences into longer, grammatically correct sentences.

CO5: Evaluate the most appropriate form in which to present information through social media

CO6: Create awareness about importance of professional behavior and suggest standard for appearance, actions, and attitudes in business environment.

Course Contents

Unit I	**Public Speaking Skills**	**(3 Hrs)**

Importance of Public Speaking Skills, Presentation Skills: Stage Presence, Body Language, Voice Modulation, Interview Skills: Self-evaluation, Formal Dressing, Clarity of thoughts, Group Discussion: Dos and Don'ts of Group Discussion, Difference between discussion and debate, Attitude		
Unit II	**Effective Body Language**	**(2 Hrs)**
Kinesics: Body language, Facial Expressions, Non-verbal behavior, Proxemics: Definition, Public Space, Social Space, Personal Space, Intimate Space, Gesture: Active Gestures, Passive Gestures, Posture: Attentive posture		
Unit III	**Syntax Skills**	**(2 Hrs)**
Definition of syntax, Syntax, and grammar; Basic concepts and terminologies, Basic elements of sentences and clauses, Syntactic categorization of sentence elements.		
Unit IV	**Technical Writing**	**(3 Hrs)**
Paragraph Writing, Report writing: Formal and Informal Report, Resume writing: Difference in CV and Resume, Advertisement writing.		
UNIT V	**Corporate/ Business Etiquette**	**(2 Hrs)**
Corporate Grooming and Dressing, Email and Telephone Etiquette, Etiquette in social and office- setting, Professional Behaviour		
Unit VI	**Basic Social Media Communication Skills**	**(3 Hrs)**
Professional Blog Writing, Building and optimizing professional profiles on social media, Creating professional and engaging content, Networking through social media		

Learning Resources

Textbooks: (Maximum 2)

1. Krishna Mohan & Meera Banerji *"Developing Communication Skills"* Macmillan

Reference Books:

1. R. C. Sharma & Krishna Mohan "*Business Correspondence and Report Writing*" (Tata McGraw Hill)
2. Raymond Murphy (CUP*) "Essential English Grammar" (Elementary &Intermediate)*
3. Saran Freeman, "*Written Communication in English*" (Orient Longman)

MOOC / NPTEL Courses:

1. NPTEL Course "*Speaking Effectively*" Prof Anjali Gera Roy ,IIT kharagpur

Link of the Course https://onlinecourses.nptel.ac.in/noc23_hs13/preview

Additional Web Resources: https://www.bbc.co.uk/learningenglish/

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: AEC	**Lab Course Title: Communicative Proficiency Skills**	
Course Code: 230UENB02_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 1** **Tutorial (T): 0** **Practical(P): 2** **Experiential Learning (EL):0**	**Theory (TH): 50 Marks**
Prerequisite Courses, if any: - Nil		

List of Laboratory Experiments	
Group A	
1.	Presentation Skills
2.	Interview Skills
3.	Group Discussion
4.	Grammar
5.	Report Writing
Group B	
6.	Paragraph Writing
7.	CV/Resume Writing
8.	Blog Writing
9.	Advertisement Writing
10.	Email Writing
Virtual LAB Links:	

JSPM UNIVERSITY PUNE
Recognized by the UGC u/s 2 (f) of UGC Act 1956 and enacted by the
State Government of Maharashtra - JSPM University Act, 2022 (Mah. IV of 2023)

JSPM University Pune

F.Y. B.Sc. Forensic Science

Semester II

Course Type: VEC	**Course Title: Ethics And Moral Values**	
Course Code: 230UPYB03_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 2	**Lecture (L): 2** **Tutorial (T): 0** **Practical (P): 0** **Experiential Learning (EL): 0**	**Theory (TH): 50 Marks**

Prerequisite Courses, if any: Nil

Course Objectives: This course will provide a comprehensive introduction to the field of ethics and morality, exploring the fundamental concepts, theories, and perspectives from both Indian and Western traditions. We will examine the nature of morality, the sources of moral value, and the relationship between ethics and individual and social well-being. The course will draw upon a range of philosophical, religious, and cultural sources to provide a nuanced understanding of ethical thought in both the East and the West.

Course Outcomes: On completion of the course, learner will be able to

CO1 Define and explain key ethical concepts, such as morality, virtue, duty, and consequentialism.

CO2 Articulate the major ethical theories from both Indian and Western traditions, including deontology, utilitarianism, and virtue ethics.

CO3 Compare and contrast ethical perspectives from different cultural and religious backgrounds

CO4 Apply ethical reasoning to contemporary moral dilemmas, such as abortion, euthanasia, and environmental ethics.

CO5 Develop their own ethical framework for making informed and responsible decisions.

CO6 Critically Evaluate and appreciate the nuances in decision making when faced with moral dilemmas in individual and professional life.

Course Contents

Unit I	**Introduction to Ethics**	**(4 Hrs)**

Why study Ethics? Context of moral dilemmas. Sources of Ethics: God, Culture, Conscience, Emotions, Ethics: Individual and Social well-being, Moral, Amoral and Nonmoral

Unit II	**Indian Orthodox traditions of Ethics**	**(5 Hrs)**

Rta and Rna the concepts of universal harmony and indebtedness, the four Purusharthas: Dharma, Artha, Kama, and Moksha, The Bhagavad Gita and the theory of Karma Yoga, Mahabharata : Exemplar of ethics from the age of puranas		
Unit III	**Indian Heterodox traditions of Ethics**	**(5 Hrs)**
Lokayata: This worldly ethics, Ahimsa: non-violence in Jainism, The Four Noble Truths and the Eightfold Path in Buddhism, Contemporary moral dilemmas from an Indian perspective		
Unit IV	**Introduction to Western Ethics**	**(6 Hrs)**
Socrates and the pursuit of virtue, Plato's ideal society and the concept of justice, Aristotle's Eudaimonia, golden mean and habits, Hedonism		
Unit V	**Medieval Period**	**(5 Hrs)**
Stoicism and the virtues of resilience and acceptance, Epicureanism and the pursuit of pleasure, Divine Command theory, Teleological theory of Ethics: Ends-Means justification		
Unit VI	**Ethical Theories**	**(5 Hrs)**
Deontological Duty centric ethics: Immanuel Kant, Utilitarianism and the principle of maximizing happiness: Mill, Trans-valuation of values: Nietzsche, What makes life significant: William James		

Learning Resources

Textbooks:

1. Bilimoria, Purusottama, Joseph Prabhu, and Renuka M. Sharma, eds. *Indian ethics: Classical traditions and contemporary challenges*. Vol. 1. Ashgate Publishing, Ltd., 2007.
2. Archie, Lee, and J. G. Archie. "Introduction to Ethical Studies: An Open Source Reader." (2003).

MOOC / NPTEL Courses:

NPTEL course,
Ethics by Dr. Vineet Sahu, IIT Kanpur
https://nptel.ac.in/courses/109104032

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: PCC	**Course Title: Forensic Analysis Lab**	
Course Code: 230HFSB12_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 1	**Lecture (L): 0** **Tutorial (T): 0** **Practical (P): 2** **Experiential Learning (EL): 0**	**Practical (PR): 50 Marks**
Prerequisite Courses, if any: Nil		

List of Laboratory Experiments	
Group A	
1.	Recording of fingerprints.
2.	Identification of Fingerprint patterns.
3.	Determination of Ridge counting/tracing in a given fingerprint.
4.	Classification of given fingerprints using Henry classification.
5.	Classification of given fingerprints using Henry-FBI classification.
6.	Classification of fingerprints using NCIC classification.
Group B	
7.	Development of latent prints using powder method.
8.	Development of fingerprint using iodine fuming method.
9.	Development of fingerprint using silver nitrate method.
10.	Experimental Working of Compound Microscope.
11.	Experimental Working of Optical Projection Microscope.
12.	Experimental Working of Polarizing Microscope.
Group C	
13.	Experimental Working of Stereo Microscope.
14.	Preparation of TLC Plate.
15.	Perform analysis using paper chromatography.
16.	Separation of ink by TLC and measurement of Rf value.
17.	Examination of chemical using UV-Vis Spectroscopy.
18.	Examination of chemical using HPLC.

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: LLC	**Course Title: Mindfulness and Wellbeing**	
Course Code: 230UPYB02_02	**Teaching Scheme: Hrs./Week**	**Examination Scheme:**
Credits: 1.5	**Lecture (L): 1 Tutorial (T): 0 Practical (P): 0 Experiential Learning (EL): 2**	**Oral (OR): 50 Marks**

Prerequisite Courses, if any:
1. Regularity and discipline
2. Practice and patience

Course Objectives:
- Participants will learn to apply mindfulness in various aspects of their lives, fostering resilience and promoting mental and emotional balance.

Course Outcomes: On completion of the course, learner will be able to
CO1: To understand the fundamental principles of mindfulness as presented in the work of Jon Kabat Zinn and Satipatthana sutta
CO2: To practice mindfulness meditation techniques for stress reduction and emotional regulation.
CO3: To explore the scientific research supporting the benefits of mindfulness-based practices.
CO4: To apply mindfulness in everyday life, including in relationships, work, and self-care.
CO5: To develop personal mindfulness practice and cultivate a sense of mindfulness in the present moment.

Course Contents

Unit I	**Introduction to Mindfulness**	**(5 Hrs)**
Definition and history of mindfulness, Understanding the mind-body connection, Benefits of mindfulness for mental and physical health, Mindful eating and drinking		
Unit II	**Mindful Meditation Techniques**	**(5 Hrs)**
Breath awareness meditation, Body scan meditation, Loving-kindness meditation, Walking meditation		
Unit III	**Integrating Mindfulness into Daily Life**	**(5 Hrs)**
Creating a mindful environment, Mindful parenting and family life, Mindfulness and creativity, Establishing a sustainable mindfulness practice		
Unit IV	**Four Types of Mindfulness**	**(5 Hrs)**

Mindfulness of the body (kāyānupassanā), Mindfulness of feelings (vedanānupassanā), Mindfulness of mind (cittānupassanā), Mindfulness of dhammas (dhammānupassanā)		
Unit V	**Managing Stress and Emotions**	**(5 Hrs)**
Mindfulness-based stress reduction (MBSR) techniques, Mindfulness for anxiety and depression, Emotional regulation through mindfulness, Mindfulness for coping with pain and discomfort		
Unit VI	**Cultivating Mindful Awareness**	**(5 Hrs)**
Developing non-judgmental awareness, Mindfulness of thoughts and emotions, Mindfulness in communication and relationships, Mindfulness in the workplace and daily activities		

Learning Resources

Textbooks:

1. Zinn, Jon Kabat. *Mindfulness for Beginners*. Jaico Publishing House, 2017.
2. Gunaratana, Henepola. *The four foundations of mindfulness in plain English*. Wisdom publications, Boston, 2012. https://www.theravadabuddhistcommunity.org/wp-content/uploads/2022/04/The-Four-Foundations-of-Mindfulness-in-Plain-English-PDFDrive-1.pdf

Reference Books:

1. Kabat-Zinn, Jon, et al. *The mindfulness revolution: Leading psychologists, scientists, artists, and meditation teachers on the power of mindfulness in daily life*. Shambhala Publications, 2011.

Coursera Courses:

1. https://www.coursera.org/specializations/mindfulness-and-well-being

JSPM University Pune F.Y. B.Sc. Forensic Science Semester II		
Course Type: IITP / FP/CEP	**Lab Course Title: Internship/Field Project/Community Engagement Programme**	
Course Code: 230HFSB13_02	**Teaching Scheme: (Hrs./Week)**	**Examination Scheme:**
Credits: 2	**Duration: 04 to 06 Weeks**	**Oral (OR): 50 Marks**
Prerequisite Courses, if any: -		

Objectives: Learners will be able to

- To expose students to the industrial environment, which cannot be simulated/experienced in the classroom and hence creating competent professionals in the industry and to understand the social, economic and administrative considerations that influence the working environment of industrial organizations.
- To provide students with an opportunity to apply theoretical knowledge from academics to the realities of the field work/training.
- To providing practical experience in a field or discipline

Course Outcomes: On completion of the course, learner will be able to

CO1: Develop professional competence through internship.
CO2: Apply academic knowledge in a personal and professional environment.
CO3: Build the professional network and expose students to future employees.
CO4: Apply professional and societal ethics in their day-to-day life.
CO5: Become a responsible professional having social, economic, and administrative considerations.
CO6: Decide own career goals and personal aspirations.

Duration and Evaluation:

- Internship to be completed after every even semester (2, 4 and 6) and before commencement of next odd semester (03, 05 and 07).
- Internship should be at least 4 to 6 weeks and it is to be assessed immediately after completion.

Framework of Internship/ Field Project / Community Engagement Programme:

- During the vacation after even semester, students are ready for industrial experience. Therefore, they may choose to undergo Internship / Field Project / Community Engagement Project
- Students may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/ NGO's/ Government

organizations/ Micro/ Small/ Medium enterprises to make themselves ready for the industry.

- Every student is required to prepare a file containing documentary proofs of the activities done by him.
- The evaluation of these activities will be done by Programme Coordinator/ Project Head / faculty / TPO/ mentor or Industry Supervisor.

Internship Guidelines:

Step 1: The department will issue request Letter/ Email to the respective industry/ firm/ NGO/ organization to allot various slots of 4-6 weeks as internship**/** Field Project / Community Engagement Project periods for the students.

Step 2: Industry will confirm the training slots allocated for internships via Confirmation Letter/ Email.

Step 3: Students on joining Training at the concerned Industry / Organization, submit the Joining Report/ Letters / Email.

Step 4: Students undergo industrial training/ Field Project / Community Engagement Project at the concerned Industry / Organization. In- between Faculty Member(s) can evaluate(s) the performance of students once/twice by visiting the Industry/Organization and Evaluation Report of the students is submitted in department.

Step 5: Students will submit training report after completion of internship.

Step 6: Training Certificate to be obtained from industry / Organization.

Internal Reporting Guidelines for students:

- Every intern should send weekly report to their internal guide without fail. It is mandatory for the intern to send weekly reports to their respective guide on regular basis.
- Interns should have at least fortnightly verbal communication with the internal guide without fail.
- In cases where in the company wants to secure their confidential information in the project / internship report, the internal guide should duly co-ordinate with the respective mentor/reporting manager on the method of reporting to assure that no information will be leaked outside and is purely for academic purposes.

Internship Diary / Internship Workbook:

- Students must maintain Internship Diary/ Internship Workbook. The main purpose of maintaining diary/workbook is to cultivate the habit of documenting. The students should record in the daily training diary account of the observations, impressions, information gathered and suggestions given, if any.
- The training diary/workbook should be signed after every day by the supervisor/ in charge of the section where the student has been working.
- Internship Diary/workbook and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training.

Internship Diary / workbook may be evaluated on the basis of the following criteria:

- Proper and timely documented entries.
- Adequacy & quality of information recorded
- Data recorded.

- Thought process and recording techniques used.
- Organization of the information.

Internship Work Evaluation:

- Every student is required to prepare and maintain documentary proofs of the activities done by him / her as internship diary or as workbook.
- The evaluation of these activities will be done by Programme Coordinator/ Project Head / faculty / TPO/ mentor or Industry Supervisor based on- overall compilation of internship activities, sub-activities, the level of achievement expected, evidence needed to assign the points and the duration for certain activities.

Evaluation-Seminar presentation / Oral Examination at the institute:

The student will present a seminar based on his training report, before an expert committee constituted by the concerned department as per norms.

The evaluation will be based on the following criteria:

- Depth of knowledge and skills Communication & Presentation Skills.
- Team Work
- Creativity
- Planning & Organizational skills
- Adaptability and Analytical Skills
- Attitude & behaviour at work.
- Societal Understanding
- Ethics
- Regularity and punctuality
- Attendance record
- Log book
- Student's Feedback from External Internship Supervisor

- **Internship Report:**
- The report shall be presented covering following recommended fields but limited to:
- Title/Cover Page
- Internship completion certificate.
- Internship Place Details- Company background-organization and activities/Scope and
- object of the study / personal observation.
- Index/Table of Contents
- Introduction
- Title/Problem statement/objectives
- Motivation/Scope and rationale of the study
- Methodological details
- Results / Analysis /inferences and conclusion
- Suggestions / Recommendations for improvement to industry, if any
- Attendance Record
- List of reference (Library books, magazines and other sources)

Feedback from internship supervisor (External & Internal):

Post internship, faculty coordinator should collect feedback about student with following recommended parameters:

- Technical knowledge
- Discipline
- Punctuality
- Commitment
- Willingness to do the work
- Communication skill
- Individual work
- Team work
- Leadership

JSPM University
FACULTY OF HEALTH SCIENCES
Wagholi, Pune-412207

Dean
FACULTY OF HEALTH SCIENCES
JSPM UNIVERSITY PUNE