CBSE | DEPARTMENT OF SKILL EDUCATION

Foundation Skills for Sciences (Pharmaceutical & Biotechnology)

(Subject Code - 421)

CLASS – X (Session 2023-2024)

Total Marks: 100 (Theory-50 + Practical-50)

	UNITS	NO. OF HOURS for Theory and Practical		MAX. MARKS for Theory and Practical
Part A	**Employability Skills**			
	Unit 1: Communication Skills-II	15		2
	Unit 2: Self-management Skills-II	10		2
	Unit 3: Information and Communication Technology Skills-II	15		2
	Unit 4: Entrepreneurial Skills-II	10		2
	Unit 5: Green Skills-II	10		2
	Total	**60**		**10**
Part B	**Subject Specific Skills**	**Theory**	**Practical**	
	Unit 1: Fundamental of Scientific Sales and Marketing	10	20	8
	Unit 2: Standard operating procedures and fundamental elements of quality	10	10	5
	Unit 3: Handling glassware in laboratory	5	15	7
	Unit 4: Chemical storage and handling in laboratory	10	10	5
	Unit 5: Fundamental science for medicine manufacturing	10	20	8
	Unit 6. Fundamental of Innovation and Research to resolve real life problems	15	15	7
	Total	**60**	**90**	**40**
Part C	**Practical Work**			
	Practical File/ Student Portfolio			20
	Project work/Field Visit			10
	Demonstration of skill competency via activities			10
	Viva			10
	Total			**50**
	Grand Total	**210**		**100**

DETAILED CURRICULUM/TOPICS FOR CLASS X

Part-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-II	15
2.	Unit 2: Self-management Skills-II	10
3.	Unit 3: Information and Communication Technology Skills-II	15
4.	Unit 4: Entrepreneurial Skills-II	10
5.	Unit 5: Green Skills-II	10
	TOTAL DURATION	**60**

NOTE: For Detailed Curriculum/ Topics to be covered under Part A: Employability Skills can be downloaded from CBSE website.

Part-B – SUBJECT SPECIFIC SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Fundamental of Scientific Sales and Marketing	30
2.	Unit 2: Standard operating procedures and fundamental elements of quality	20
3.	Unit 3: Handling glassware in laboratory	20
4.	Unit 4: Chemical storage and handling in laboratory	20
5.	Unit 5: Fundamental science for medicine manufacturing	30
6.	Unit 6: Fundamental of Innovation and Research to resolve real life problems	30
	TOTAL DURATION	**150**

UNIT 1: Fundamental of Scientific Sales and Marketing

LEARNING OUTCOMES	THEORY	PRACTICAL
1. Introduction to Sales and Marketing	1. Understanding the concepts of sales and marketing 2. Differentiating between sales and marketing 3. Exploring the importance of sales and marketing in business 4. Overview of the scientific approach in sales and marketing	1. Conducting a market research project
2. Market Research and consumer Behavior	1. Understanding the role of market research in sales and marketing 2. Conducting surveys and interviews 3. Factors influencing consumer behavior 4. Understanding consumer needs and want	1. Collecting and analyzing data 2. Analyzing consumer buying decisions based on case studies 3. Developing marketing strategies based on consumer behavior analysis
3. Marketing Mix , Advertising and Promotion	1. Introduction to the marketing mix (4Ps: Product, Price, Place, Promotion) 2. Introduction to advertising and promotion 3. Types of advertising media and Creating effective advertisements	1. List down different Creating effective advertising techniques 2. Developing and implementing a digital marketing campaign using social media and other digital platforms

UNIT 2: Standard operating procedures and fundamental elements of quality

LEARNING OUTCOMES	THEORY	PRACTICAL
1. Standard Operating Procedures(SOP) and its importance	1. Discuss standard operating procedures in life sciences sector 2. Discuss SOP development process and framework 3. Explain with the help of example how SOPs help finding of what, why, how, when and who of a process 4. Discuss the types of SOP and maintenance with time	1. Demonstrate how to prepare SOP

2. Identify fundamental elements of Quality Assurance	1. Discuss the role of Quality assurance in life sciences sector 2. Elaborate on QMS (quality management system) 3. Explain the use of quality manual in pharmaceutical industry 4. Discuss organizational structure and responsibility	1. Make a flowchart of your responsibility as a quality assurance person 2. Create a checklist for quality assurance in your lab

UNIT 3: Handling glassware in laboratory

LEARNING OUTCOMES	THEORY	PRACTICAL
1. Glassware in life sciences industry / science labs	1. Discuss the types of glassware used in pharma, biotech industry/ science lab 2. Discuss class A and class B glassware 3. Explain the process of glassware and their advantages in life sciences industry	1. List down different glassware used in pharmaceuticals industry 2. List down importance of each glassware in school lab
2. Handling of glassware	1. Explain the need of proper handling of glassware 2. Discuss SOP for glassware handling 3. Discuss labeling and proper storage of glassware 4. Discuss GDP for glassware devices 5. Discuss glassware handling while heating and cooling 4. Explain the glassware cleaning SOPs	1. Demonstrate how to handle glassware devices as per SOP. 2. Demonstrate how to identify class A and class B glassware mix-up

Unit 4: Chemical storage and handling in laboratory

LEARNING OUTCOMES	THEORY	PRACTICAL
1. Chemical storage techniques	1. Elaborate on different types of chemicals used in pharmaceuticals and biotechnology industry 2. Discuss labeling and storage of chemicals 3. Elaborate on handling hazardous chemicals with safety and precautions	1. Prepare a list of all the chemicals used in your laboratory 2. Check if the labeling is proper or not

2. Chemical handling	1. Discuss chemical handling according to SOP 2. Explain documentation practices for reagents and stocks used 3. Handling of chemicals with proper safety as per the respective SDS 4. Describe destruction procedure of laboratory reagents and acids	1. Prepare two separate list of hazardous and non-hazardous chemicals 2. Check the status label on the containers for the correct product name, batch number, container number etc.

Unit 5: Fundamental science for medicine manufacturing

LEARNING OUTCOMES	THEORY	PRACTICAL
1. Introduction to Medicine Manufacturing and Chemistry of Medicines	1. Overview of the pharmaceutical industry and medicine manufacturing processes 2. Basic principles of organic chemistry related to medicine manufacturing	1. List down few manufacturing industries.
3. Manufacturing Processes and Regulatory Requirements	1. Overview of different manufacturing processes 2. Introduction to regulatory authorities and their roles in medicine manufacturing 3. Good Manufacturing Practices (GMP) in production	1. Analyzing real-world case studies related to medicine manufacturing
4. Pharmaceutical Industry Trends and Future Developments	1. Current trends and advancements in medicine manufacturing 2. Emerging technologies and their impact on the pharmaceutical industry	1. Future prospects and challenges in the field 2. Exploring career opportunities in medicine manufacturing

UNIT 6: Fundamental of Innovation and Research to resolve real life problems

LEARNING OUTCOMES	THEORY	PRACTICAL
1. Introduction to Innovation and Research	1. Understanding the concepts of innovation and research 2. Exploring the importance of innovation and research in problem-solving 3. Identifying real-life problems and challenges	1. Identifying and analyzing real-life problems in the local community or school 2. Conducting surveys, interviews, or observations to gather data
2. Research Design and Methodology	1. Introduction to research design and methodology 2. Different types of research (qualitative, quantitative, mixed-methods)	1. Developing research plans and selecting appropriate research methods 2. Designing questionnaires or interview guides for data collection
3. Innovation Process	1. Understanding the innovation process and its stages 2. Idea generation techniques (brainstorming, mind mapping, etc.) 3. Evaluating and selecting ideas for implementation	1. Conduct Brainstorming and generating innovative ideas to address identified problems
4. Intellectual Property and Patenting	1. Introduction to intellectual property rights 2. Understanding patents and their significance in innovation	1. Conducting research to identify existing patents related to innovative solutions