SEC-III

Session: 2024-25			
Part A – Introduction			
Subject	Chemistry		
Semester	III		
Name of the Course	Food Adulteration Testing		
Course Code	B23-SEC-308		
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC)	SEC		
Level of the course (As per Annexure-I	100-199		
Pre-requisite for the course (if any)	--		
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: 1 Know about common food adulterants 2 Learn methods of detection of adulterants in food 3 Get aware about laws related with adulteration 4 Understand the role of several agencies. 5*. Practically detect adulteration in foods.		
Credits	Theory	Practical	Total
	2	1	3
Contact Hours	30	30	60
Max. Marks: 50+25* Internal Assessment Marks: 15+5*=20 End Term Exam Marks: 35+20* =55		**Time: Theory: 3 Hours Practicum: 3 Hours**	
Part B- Contents of the Course			
Instructions for Paper- Setter Note: The examiner is requested to set nine questions in all, selecting two questions from each SECTION and one question (Question No.1 based on			

entire syllabus will consist of short answer type. All questions carry equal marks. The candidate is required to attempt five questions in all selecting one from each SECTION. Question No.1 is compulsory.	
Unit	**Topics**
I	**Common Foods and Adulteration** 8 Hrs Common Foods subjected to Adulteration - Adulteration Definition – Types; Poisonous substances, Foreign matter, Cheap substitutes, Spoiled parts. Adulteration through Food Additives – Intentional and incidental. General Impact on Human Health.
II	**Adulteration of Common Foods and Methods of Detection** 8 Hrs Means of Adulteration, Methods of Detection Adulterants in the following Foods; Milk, Oil, Grain, Sugar, Spices, Processed food, Fruits and vegetables. Additives and Sweetening agents (at least three methods of detection for each food item).
III	**Present Laws and Procedures on Adulteration** 7 Hrs Highlights of Food Safety and Standards Act 2006 (FSSA) –Food Safety and Standards Authority of India–Rules and Procedures of Local Authorities.
IV	7 Hrs Role of voluntary agencies such as, Agmark, I.S.I. Quality control laboratories of companies, Private testing laboratories, Quality control laboratories of consumer co-operatives. Consumer education, Consumer's problems rights and responsibilities, COPRA 2019 - Offenses and Penalties – Procedures to Complain – Compensation to Victims.
V*	30 Hrs 1. Determination of urea & starch in milk. 2. Determination of starch in Khoa products. 3. Determination of Margarine in Ghee. 4. Determination of Metanil yellow colour in Jaggery. 5. Determination of colored saw dust in turmeric powder.
Suggested Evaluation Methods Short Answer and MCQ Type QUESTIONS	
Internal Assessment: 15 ➢ **Theory** • Class Participation: 04 • Seminar/presentation/assignment/quiz/class test etc.: 04 • Mid-Term Exam: 07 ➢ **Practicum: 05** • Class Participation: 02 • Seminar/Demonstration/Viva-voce/Lab records etc.: 03 • Mid-Term Exam: NIL	**End Term Examination: 35+20***

Part C-Learning Resources

Recommended Books/e-resources/LMS:

- ✓ Bright Siaw Afriyie, Introduction to Computer fundamentals.
- ✓ First course in Food Analysis – A.Y. Sathe, New Age International(P)Ltd.,1999
- ✓ Food Safety, case studies – Ramesh. V. Bhat, NIN, 1992
- ✓ https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/Beverages_and_confectionary.pdf
- ✓ https://cbseportal.com/project/Download-CBSE-XII-Chemistry-Project-Food-Adulteration#gsc.tab=0
- ✓ https://www.fssai.gov.in/
- ✓ https://indianlegalsolution.com/laws-on-food-adulteration/
- ✓ https://fssai.gov.in/dart/
- ✓ https://byjus.com/biology/food-adulteration/
- ✓ Wikipedia

*Applicable for courses having practical component.

SEC-III

Session: 2024-25			
Part A - Introduction			
Subject	Chemistry		
Semester	III		
Name of the Course	Waste Management Techniques		
Course Code	B23-SEC-317		
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC)	SEC		
Level of the course (As per Annexure-I	100-199		
Pre-requisite for the course (if any)			
Course Learning Outcomes(CLO):	After completing this course, the learner will be able to: 1. Identify various types of wastes and their sources 2. Understand the sanitary landfill and other disposal method for solid waste. 3. Understand the treatment methods for waste water. 4. Examine the role of biotechnology in reduction of different waste. 5*. To compare the different waste treatment techniques and suggest for better environment.		
Credits	Theory	Practical	Total
	2	1	3
Contact Hours (per week)	30	30	60

Max. Marks: 50+25*=75 Internal Assessment Marks: 15+5*=20 End Term Exam Marks: 35+20*=55	Time Theory: 3 Hours Practicum: 3 Hours

Part B- Contents of the Course

Instructions for Paper- Setter

For final theory exam time allowed will be of 2 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit	Topics
I	8 Hrs **Waste**: Classification, generations and characterization. Basic aspects of Solid waste management generation; on-site handling, storage and processing; collection of solid wastes; transfer and transport; processing techniques; ultimate disposal. **Hazardous waste** –Definition, sources, effects, disposal and management techniques. Physical, chemical, physico- chemical treatment, and thermal treatment;-Solidification, chemical fixation, encapsulation, pyrolysis and incineration. **Biomedical wastes** – Definition, categories, and management, E-waste: Sources and management
II	8 Hrs **Disposal of Solid waste**: sanitary land filling – site selection, design and operation of sanitary landfills – Leachate collection & treatment. Secure land filling. **Incineration**: Mass burn, Rotatory Kiln, Fluidized Bed incinerator, liquid injection incinerator, Waste gas flare incinerator, fixed grate incinerators, Plasma Pyrolysis. Composting, vermicomposting.
III	7 Hrs **Principles of Industrial waste treatment** - sources of pollution physical chemical, organic and biological properties. Manufacturing processes, flow sheets, characteristics and composition of wastes including waste reduction, treatment and disposal methods for Food Industries: Sugar, Fermentation, Material Industries: Paper, Steel - Metal - plating and petroleum refineries.

IV	**Role of Biotechnology in waste minimization**; Recovery of by- products and raw material from wastewater conversion: waste recovery and reuse, reclamation by ground water recharge, agriculture reuse of effluent; sludge as fertilizer; biomass for energy, metal recovery, bioscrubbing. Biological Treatment Biological methods for waste processing: Biomethanation, Biodeisel, Biohydrogen.	**7 Hrs**
V*	1. To study about the various sources of solid waste generation in the locality. 2. To study about the categories of hazardous waste. 3. To study about the sanitary land fill management –case study 4. To estimate the BOD_5 and COD of the waste water. 5. To study about the working of Sewage treatment plant-case study.	**30 Hrs**

Suggested Evaluation Methods

Internal Assessment: ➢ **Theory** • Class Participation: 04 marks • Seminar/presentation/assignment/quiz/class test etc.: 04 marks • Mid-Term Exam: 07 marks ➢ **Practicum** • Class Participation: 02 • Seminar/Demonstration/Viva-voce/Lab records etc.: 03 marks • Mid-Term Exam: NIL	**End Term Examination:** Theory: 35 marks (Written exam) Practical: 20 marks (Demonstration: 10 Viva- voce :5 Lab records: 5)

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Crites R.W., Reed S.C and Bastion R. (2000). Land Treatment Systems for Municipal & Industrial Wastes. McGraw Hill Companies Inc.
2. Eckenfelder W.W. (1966). Industrial Water Pollution Control. McGraw Hill Publications.
3. Bhatia S.C. (2007). Solid and Hazardous Waste Management, Nice Printing Press, Delhi.
4. Singh, J.S., Singh, S.P and Gupta, S.R. (2015). Ecology, Environment and Resource Conservation, S. Chand Publishing, New Delhi.
5. Sidwick J.M and Holdom R.S. (1987). Biotechnology waste treatment and exploitation, Ellis horwood limited, England.

*Applicable for courses having practical component.

VAC-3

Session: 2024-25			
Part A – Introduction			
Subject	Chemistry		
Semester	III		
Name of the Course	Environment and society		
Course Code	B23-VAC-301		
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC)	VAC		
Level of the course (As per Annexure-I	100-199		
Pre-requisite for the course (if any)	4.0		
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: 1. Able to explain the relationship between the environment and society 2. Understanding the role played by environment, society and, their interface in shaping environmental decisions 3. Student will able to think critically on environmental issues and different solutions 4*. -NA-		
Credits	Theory	Practical	Total
	2	N. A.	2
Contact Hours	30	N. A.	30
Max. Marks: 50 **Internal Assessment Marks: 15** **End Term Exam Marks: 35**		**Time: Three Hours**	
Part B- Contents of the Course			

Instructions for Paper- Setter

Note: The examiner is requested to set nine questions in all, selecting two questions from each SECTION and one question (Question No.1 based on entire syllabus will consist of short answer type. All questions carry equal marks. The candidate is required to attempt five questions in all selecting one from each SECTION. Question No.1 is compulsory.

Unit	Topics	Contact Hours
I	**Introduction:** Social and cultural construction of 'environment'; environmental thought from historical and contemporary perspective in light of the concepts of Gross Net Happiness and Aldo Leopold's Land Ethic **Issues in Environmentalism:** Significant global environmental issues such as acid rain, climate change, and resource depletion; historical developments in cultural, social and economic issues related to land, forest, and water management in a global context; interface between environment and society.	8 Hrs
II	**Development -Environment Conflict:** Developmental issues and related impacts such as ecological degradation; environmental pollution; development-induced displacement, resettlement, and rehabilitation: problems, concerns, and compensative mechanisms; discussion on Project Affected People (PAPs). **Urbanization and environment:** Production and consumption oriented approaches to environmental issues in Indian as well as global context; impact of industry and technology on environment; urban sprawl, traffic congestion and social-economic problems; conflict between economic and environmental interests.	8 Hrs
III	**Environment and Social Inequalities:** Inequalities of race, class, gender, region, and nation-state in access to healthy and safe environments; history and politics surrounding environmental, ecological and social justice; environmental ethics, issues and possible solutions. **Regulatory Framework:** Brief account of Forest Conservation Act 1980 1988; Forest Dwellers Act 2008; Land Acquisition Act1894, 2007, 2011, 2012; Land Acquisition Rehabilitation and Resettlement Act 2013	8 Hrs

IV	**Community Participation:** State, corporate, civil society, community, and individual-level initiatives to ensure sustainable development: case studies of environmental movements (Appiko Movement, Chipko Movement, Narmada Bachao Andolan); corporate responsibility movement; appropriate technology movement, citizen groups; role played by NGOs; environmental education and awareness.	**6 Hrs**
V*	**N.A.**	

Suggested Evaluation Methods

Short Answer and MCQ Type QUESTIONS

Internal Assessment: ➢ **Theory: 15** • Class Participation: 04 • Seminar/presentation/assignment/quiz/class test etc.: 04 • Mid-Term Exam: 07 ➢ **Practicum Nil** • Class Participation: • Seminar/Demonstration/Viva-voce/Lab records etc.: • Mid-Term Exam:	**End Term Examination: 35**

Part C-Learning Resources

Recommended Books/e-resources/LMS:

✓ NCERT Chemistry

VAC-4

Session: 2023-24			
Part A – Introduction			
Subject	Chemistry		
Semester	IV		
Name of the Course	Chemistry in everyday life		
Course Code	B-23-VAC-401		
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC)	VAC		
Level of the course (As per Annexure-I	100-199		
Pre-requisite for the course (if any)	4.0		
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: 4. Critically think about the presence of chemicals in daily life 5. Understand presence of chemicals used in food 6. Analyse importance of Vitamins and minerals 7. Think about general medicines 5*. -NA-		
Credits	Theory	Practical	Total
	2	N. A.	2
Contact Hours	30	N. A.	30
Max. Marks: 50 **Internal Assessment Marks: 15** **End Term Exam Marks: 35**		**Time: Three Hours**	
Part B- Contents of the Course			
Instructions for Paper- Setter Note: The examiner is requested to set nine questions in all, selecting two questions from each SECTION and one question (Question No.1 based on			

entire syllabus will consist of short answer type. All questions carry equal marks. The candidate is required to attempt five questions in all selecting one from each SECTION. Question No.1 is compulsory.

Unit	Topics & Contact Hours
I	**Soaps and detergents** 8 Hrs Cleansing action of soap, Cleansing action of detergents **Propellants** Solid propellant, liquid propellants, hybrid propellants dyes: Cause of exhibition of color, chromophore, auxochrome, classification of dyes **Advanced chemicals** Ceramics, Sunscreens
II	**Chemicals used in foods** 7 Hrs Preservatives, coloring agents, sweetening agents, flavoring agents, antioxidants Chemicals used to grow, protect foods and crops: Fertilizers, Fungicides, Herbicide and Insecticide etc.
III	**Vitamins and minerals** 7 Hrs Definition, their significance, **Fat soluble vitamins** Names, daily dietary requirement, natural sources, Deficiency diseases **Water soluble vitamins** Names, daily dietary requirement, natural sources, Deficiency diseases **Minerals** Major and Minor nutrients, daily dietary requirement, natural sources, Deficiency diseases
IV	**Chemicals in Medicine** 8 Hrs Drug - target interaction (enzymes as drug targets and receptors as drug targets), chemical messengers, types of chemical messengers (hormones and neurotransmitters) **Chemotherapy** antipyretics, analgesics, antidepressants' antiseptics and disinfectants, antiviral drugs, antacids, antimalarial, anesthetics, tranquilizers, hypnotics and sedatives, ant allergic drugs and histamines
Suggested Evaluation Methods Short Answer and MCQ Type QUESTIONS	

Internal Assessment: ▹ **Theory: 15** • Class Participation: 04 • Seminar/presentation/assignment/quiz/class test etc.: 04 • Mid-Term Exam: 07 ▹ **Practicum Nil** • Class Participation: • Seminar/Demonstration/Viva-voce/Lab records etc.: • Mid-Term Exam:	**End Term Examination: 35**

Part C-Learning Resources

Recommended Books/e-resources/LMS:

✓ NCERT Chemistry