

Syllabus

For
Certificate Course
In
“Quality Control in Microbiology”

Coordinated by
Department Of Microbiology
Dhanaji Nana Mahavidyalaya, Faizpur
2013-14

Title of the Course: Certificate course in Quality Control in Microbiology.

Objective:

- To inculcate concepts in quality control in Microbiology
- To understand techniques for maintaining quality
- To increase employability skills of the students
- To comprehend laboratory safety and aseptic techniques

Duration of course : six months

Course structure :

- 1) Paper I - Quality Control and Management
- 2) Paper II- Laboratory course in Microbiology

Eligibility for admission: H.S.C. or equivalent qualification from recognized institution

Skeleton of the course:

Sr. No	Paper	Name of Subject	Theory /Practical	Teaching Hours	Maximum Marks Allotted			Passing		
					External	Internal	Total	External	Internal	Total
	Paper I	Quality Control and Management	Theory	45	80	20	100	32	08	40
	Paper II	Laboratory Course In Microbiology.	Practical	60	80	20	100	32	08	40

Coordinator

External Expert

Principal

Paper I: Quality Control And Management

Unit: I Concept of Quality Management

(05 hr)

- Good manufacturing Practices
- Good laboratory Practices
- Quality Control
- Quality Assurance
- Audit and record

Unit II General aspects of spoilage and Contaminants

(10hr)

- Concept of contamination
- (Atmosphere, water, operator, raw material, packaging, buildings, equipments)
- General Characteristics of contaminants viz. Bacteria, fungi, virus etc
- Source of contamination, Air/ water micro flora
- Observation of contaminants - microscopy and staining
- Control / prevention of contamination
- Raw material, in process and final product
- Concept of Microbial spoilage
- Types & factors affecting on spoilage
- Preservation

Unit-III Laboratory preparations and cleaning strategies

(07 hr)

- Normality, Molarity, Molality, Percent solution, ppm, ppb, Conversion of weight
- size, volume, Preparation of buffers and solution, Weighing and dissolving
- Making stock solution and its dilution, serial dilution
- Cleanliness in laboratory
- Cleaning of glassware's
- Concept of Disinfection, Disinfectant, Sanitizer, Germicides, Bactericide
- Ideal Characteristics of Disinfectant
- Examples :- Phenolic compounds, Halogens, Heavy Metals etc

Unit- IV Sterilization

(07 hr)

- Survivor curve, D, Z, F value
- Methods: Heat, Gaseous, Radiation, Filtration
- Sterilization control- Physical, chemical and biological indicators
- Disposal of microbial waste
- Classes of Manufacturing Area
- Instruments involved in aseptic handling
- Inoculations
- In process sampling

Unit-V Cultivations of Microbes**(08 hr)**

- Concept of growth
- Media- Liquid, Solid
- Isolation methods- Streak plate, Pour plate, Spread plate
- Biochemical Characteristics
- Cultivation of Fungi
- Maintenance of pure culture

Unit: VI Standard guidelines and Statistical reports**(08 hr)**

- WHO, FDA, BIS, ISO, NABL
- Pharmacopeia's: IP, BP, USP
- Measures of central tendency and dispersion
- Probability and its distribution
- Concepts of hypothesis testing, correlation and regression
- Graphical representation of data

References:

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9. Gupta A. Analytical Chemistry, PragatiPrakashan, Meerut (2006)
10. Sukumar De, Outline of Dairy Technology, Oxford Univ. press, New Delhi. (2005)
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13. Quality Control Methods for Medicinal Plant material, WHO, Geneva (2002)
14. Hugo, W. and Russell, A. Pharmaceutical Microbiology 6th ed-Oxford, UK (2003)
15. Khan and Khanum, Fundamentals of Biostatistics, Ukaaz Publications (1994)

Paper II: Laboratory course in Microbiology

1. Demonstration of safety measures in laboratory
2. Precision and accuracy of pipette
3. Calibration of Balance and pH meter
4. Preparation of normal, molar, percentage solutions, ppm solution and labelling
5. Cleaning of Laboratory and Use and care of Microscope
6. Gram staining technique
7. Media preparation
8. Sterilization methods - dry and moist heat
9. Sterilization indicator for autoclave : Chemical and biological
10. Aseptic technique -Using personal hygiene, Bunsen burner, LAF, Biosafety cabinet
11. Growth Promotion Test for media
12. Isolation of bacteria-Using streak plate, Spread plate methods
13. Slide culture technique for fungal cultivation
14. Determination of Total Viable Count by Pour plate technique
15. Determination of Microbial limit test of finish product
16. Determination of Most probable number of water
17. Environmental monitoring by settling plate technique/ air sampler
18. Sterility test by membrane filtration method
19. Fumigation of laboratory
20. Use of MS office and MS excel for record maintenance
21. Industry visit

References:

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2. Adams, D. S., Lab Math, I. K. International, New Delhi (2004)
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6. Thimmaiah, S, R., Standard Methods of biochemical analysis, Kalyani Publication., Ludhiana (2006)
7. Jayaraman, J. Laboratory Manual in Biochemistry, New Age Int. New Delhi (2008)