



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Page 1 of 6

Department of Biotechnology		LP: BT22078
B.E/B.Tech/M.E/M.Tech : Biotechnology	Regulation: 2022	Rev. No: 00
PG Specialisation : NA		Date: 12/06/2026
Sub. Code / Sub. Name : BT22078 - BIOSAFETY AND HAZARD MANAGEMENT		
Unit : I		

Unit Syllabus: Fundamental principles of biosafety and biosecurity

(9)

Objective: To understand the fundamental principles of biosafety and biosecurity

Session No *	Topics to be covered	Ref	Teaching Aids
01	Introduction and historical background of biosafety concept	TB 1 (Pp. 1-12)	PPT, ICT Tools & BB
02	Introduction to Biological Safety Cabinets (BSC)	TB 1 (Pp. 1-12)	PPT, ICT Tools & BB
03	Primary containment for biohazards	TB 1 (Pp. 487-508)	PPT, ICT Tools & BB
04	Biosafety levels and containment facilities	TB 1 (Pp. 303-323)	PPT, ICT Tools & BB
05	Routes of transmission and modes of exposure	TB 1 (Pp. 509-530) TB 2 (Pp. 23-51)	PPT, ICT Tools & BB
06	laboratory practices and procedures and Personal protective equipment (PPE)	TB 1 (Pp. 90-116)	PPT, ICT Tools & BB
07	Decontamination techniques and waste management	IS 1	PPT, ICT Tools & BB
08	Recommended biosafety levels for infectious agents and infected animals	TB 1 (Pp. 579-586)	PPT, ICT Tools & BB
09	Biosafety guidelines by government of India	TB 1 (Pp. 587-593)	PPT, ICT Tools & BB

Content beyond syllabus covered (if any):

COVID diagnosis & Vaccine development case study.

* Session duration: 50 minutes



Sub. Code / Sub. Name: **BT22078 - Biosafety And Hazardous Management**

Unit: **II**

Unit Syllabus : Biological hazards and wastes management (9)

Objective : To acquire knowledge on biological waste management and disposal

Session No *	Topics to be covered	Ref	Teaching Aids
10	Introduction to biohazard and wastes	TB1 (Pp. 81-97) IS 2	PPT, ICT Tools & BB
11	Transfer stations optimizing waste allocation	TB1 (Pp. 292-297)	PPT, ICT Tools & BB
12	Transfer stations optimizing waste compatibility & storage	IS 3	PPT, ICT Tools & BB
13	Labeling and handling of hazardous wastes	TB1 (Pp. 290-297)	PPT, ICT Tools & BB
14	Hazardous waste manifests	IS 4	PPT, ICT Tools & BB
15	hazardous waste transport	TB1 (Pp. 298 -302) TB2 (Pp. 21-26)	PPT, ICT Tools & BB
16	Bio-medical waste	TB1 (Pp. 433 - 435) IS 4	PPT, ICT Tools & BB
17	Hazardous waste management rules	TB2 (Pp. 21-26) IS 4	PPT, ICT Tools & BB
18	Hazardous waste documentation and Regulatory Compliance	RF 3	PPT, ICT Tools & BB

Content beyond syllabus covered (if any):

Importance of waste management for sustainable environment.

* Session duration: 50 mins



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: **BT22078 - Biosafety And Hazardous Management**Unit: **III****Unit Syllabus : Regulatory requirements and ethical considerations in GMOs (9)****Objective : To comprehend regulatory requirements and ethical considerations in Genetically Modified Organisms biosafety.**

Session No *	Topics to be covered	Ref	Teaching Aids
19	GMOs & LMOs; Biosafety regulations and guidelines	TB3 (Pp. 8-10)	PPT, ICT Tools & BB
20	Roles of institutional biosafety committee (IBC)	TB1 (Pp. 417-422) TB3 (Pp. 36-40)	PPT, ICT Tools & BB
21	Regulatory body and frameworks - RCGM, GEAC etc. for GMO applications in food and agriculture	TB3 (Pp. 35-40)	PPT, ICT Tools & BB
22	GMO approval Process and environmental release of GMOs	TB1 (Pp. 431-435) TB3 (Pp. 05-07)	PPT, ICT Tools & BB
23	Risk analysis and risk assessment	TB3 (Pp. 22-25)	PPT, ICT Tools & BB
24	Risk management and communication	TB1 (Pp. 441-445)	PPT, ICT Tools & BB
25	Overview of national regulations	TB3 (Pp. 33-35)	PPT, ICT Tools & BB
26	International agreements including Cartagena protocol	TB3 (Pp. 35-55)	PPT, ICT Tools & BB
27	Advanced research in GMOs and environmental impact	IS 5	PPT, ICT Tools & BB

Content beyond syllabus covered (if any):

Case study on GMOs in food and medicine.

* Session duration: 50 mins



Sub. Code / Sub. Name: **BT22078 - Biosafety And Hazardous Management**

Unit: **IV**

Unit Syllabus : Bio-risk assessment strategies and mitigation plans

(9)

Objective : To develop risk assessment strategies and mitigation plans for biological hazards

Session No *	Topics to be covered	Ref	Teaching Aids
28	Overall risk analysis – COVID, outbreaks	TB1 (Pp. 504 – 510) TB2 (Pp. 37-55))	PPT, ICT Tools & BB
29	Emergency planning: on site & off site	TB2 (Pp. 21-26) RF 2 (Pp. 05-08))	PPT, ICT Tools & BB
30	Risk management ISO 14000	RF 2 (Pp. 12-14) TB1 (Pp 264 -270)	PPT, ICT Tools & BB
31	Quantitative risk assessment	TB1 (Pp 266 -270) TB2(Pp. 89-94)	PPT, ICT Tools & BB
32	Rapid and comprehensive risk analysis	TB2(Pp. 89-94) TB4 (Pp. 104-106)	PPT, ICT Tools & BB
33	Risk due to radiation and explosion due to over pressure	RF2 (Pp. 26-32) TB 4 (Pp. 191 -197)	PPT, ICT Tools & BB
34	Potential hazards, extreme operating conditions, toxic chemicals	TB1 (Pp. 305-309) TB 4 (Pp. 283 -287)	PPT, ICT Tools & BB
35	Safe handling of valuable biological materials	TB1 (Pp. 163-164) TB5 (Pp 35 -39)	PPT, ICT Tools & BB
36	Potential misuse of bioscience and elements of a laboratory biosecurity	TB1 (Pp. 531 -550)	PPT, ICT Tools & BB
Content beyond syllabus covered (if any):			
Safety protocols followed in Biotech R&D labs and outbreak analysis			

* Session duration: 50 mins



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: **BT22078 - Biosafety And Hazardous Management**Unit: **V****Unit Syllabus : Current scenarios and case studies to apply biosafety principles (9)****Objective : To analyze current scenarios and case studies to apply biosafety principles in real-world situations**

Session No *	Topics to be covered	Ref	Teaching Aids
37	Hazard identification safety audits	RF3, TB2 (Pp. 221-229)) TB5 (Pp. 331-350)	PPT, ICT Tools & BB
38	Checklist, What if analysis, Vulnerability models	RF 4	PPT, ICT Tools & BB
39	Event tree analysis & fault tree analysis	TB2 (Pp. 89-94) TB5 (Pp. 472 -480)	PPT, ICT Tools & BB
40	Ethical dilemmas and decision-making in biosafety management	TB2 (Pp. 14-25) RF1 (Case history 1)	PPT, ICT Tools & BB
41	Covid and Nipah Virus	TB2 (Pp. 14-25) RF 1 (Case history 3-5)	PPT, ICT Tools & BB
42	Vizag, Bhopal analysis	TB2 (Pp. 14-25) RF1 (Case history 1)	PPT, ICT Tools & BB
43	Personal safety	TB1 (Pp 496-498)	PPT, ICT Tools & BB
44	Prevention of chemical hazards	TB1 (Pp 278-280) TB5 (Pp. 87-95)	PPT, ICT Tools & BB
45	Management of spills	TB1 (Pp 67-69)	PPT, ICT Tools & BB

Content beyond syllabus covered (if any):

Case studies on risk management and strategies in implementation of plan.

* Session duration: 50 mins



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Page 1 of 6

Sub Code / Sub Name: **BT18015 - Biosafety And Hazardous Management****TEXT BOOKS:**

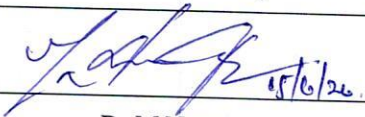
1. Fleming D.O, and Hunt D.L, "Biological Safety: Principles and Practices", 4th Edition, American Society for Microbiology, 2006.
2. 4. Hyatt, N, Guidelines for process hazards analysis, hazards identification & risk analysis, Dyadem Press, 2004
3. Young T, "Genetically Modified Organisms and Biosafety: A Background Paper for Decision-Makers and Others to Assist in Consideration of GMO Issues" 1st Edition, World Conservation Union, 2004.
4. Fawatt H.H, and Wood, W.S, "Safety and Accident Prevention in Chemical Operation", Wiley Interscience, 1965.
5. Industrial Accident Prevention (1941): Heinrich H. W.

REFERENCES:

1. Handley, W, "Industrial Safety Hand Book ", 2nd Edn., McGraw-Hill Book Company, 1969.
2. Taylor, J.R, "Risk analysis for process plant, pipelines and transport", Chapman and Hall, London, 1994
3. <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/hw-35.pdf>
4. https://www.researchgate.net/publication/267345303_The_Structured_What_IfChecklist_A_New_Twist_On_An_Old_Approach

INTERNET SOURCES:

1. <https://www.fda.gov/drugs/pharmaceutical-quality-resources/facts-about-current-good-manufacturing-practices-cgmp>
2. <https://biosafety.utk.edu/biosafety-program/waste/>
3. <https://cpheeo.gov.in/upload/uploadfiles/files/chap9.pdf>
4. <https://www.epa.gov/hwgenerators/hazardous-waste-manifest-system#:~:text=EPA's%20hazardous%20waste%20manifest%20system,dispose%20of%20the%20hazardous%20waste.>
5. <https://www.fda.gov/food/agricultural-biotechnology/how-gmo-crops-impact-our-world>

	Prepared by	Approved by
Signature		
Name	Dr M Nareshkumar	Dr E Nakeeran
Designation	Assistant Professor	Professor and HOD
Date	12/06/2026	12/06/2026
Remarks *:	The same lesson plan is followed from the previous academic year.	
Remarks *:	This lesson plan provides in-depth understanding to the biosafety and risk management systems.	

* If the same lesson plan is followed in the subsequent semester/year it should be signed by the Faculty and the HOD