

Curriculum Planner
(Department of Botany, Kalindi College)
Dr. Priyanka Verma (2025-2026)

Course: B.Sc.(H) Botany

Semester: VII

Paper: Environmental Biotechnology & Management (Theory & Practical) DSE

Topic	Reference	Approximate (schedule)
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Unit 1: Environment Basic concepts and issues, global environmental problems - ozone layer depletion, UV-B, greenhouse effect and acid rain due to anthropogenic activities, their impact and biotechnological approaches for management. Fate of pollutants in the environment, Bioconcentration, Biomagnification. Unit 2: Microbiology of waste water treatment Aerobic process - activated sludge, oxidation ponds, trickling filter. Anaerobic process -anaerobic digestion, anaerobic filters, up-flow anaerobic sludge blanket reactors. Treatment schemes for waste waters of dairy and sugar industries. Unit 3: Content: Xenobiotic compounds and their Biotreatment Organic (Bio degradation of petroleum products and pesticides) and inorganic (heavy metals, phosphates, nitrates). Bioremediation of xenobiotics in environment - ecological consideration, Bioaccumulation and Biosorption of heavy metals, Biopesticides, bioreactors, bioleaching, biomining, biosensors, Bioindicators and Bioprospecting Unit 4: Legislations, Policies for Environmental Protection and Pollution Management Stockholm Conference (1972) and its declaration, WCED (1983) and Montreal Protocol - 1987, Kyoto Protocol- 1997. Environmental ethics, Water Pollution (Prevention and Control) Act- 1974, Air Pollution (Prevention and Control) Act-1981, National Environmental Policy - 2006, Central and State Pollution Control Boards: Constitution and power.	1. De, A. K. (2022). Environmental Chemistry, 10th Edition, New Delhi. New Age International Pvt. Limited 2. Dennis, A., Seal, K.J., Gaylarde, C.C. (2004). Introduction to Biodeterioration, Cambridge University Press 3. Rahman, Z. Thomas, L., (2025) Industrial and Environmental Microbiology. ISBN: 9781032644769. CRC Press 4. Ahmed, N., Qureshi, F.M., Khan, O.Y. (2006). Industrial and Environmental Biotechnology, Horizon Press 5. Rochelle, P.A. (2001). Environmental Molecular Biology, Horizon Press. 6. Jadhav, H.V., Bhosale, V.M. (2015). Environmental Protection and Laws, Himalaya publishing House Pvt Ltd. 7. Trivedi, P. C. (2006). Biodiversity Assessment and Conservation, Agrobios Publ. 8. Rana, S.V.S. (2015). Environmental Biotechnology, Rastogi Publications, India.	August 2025- December 2025
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Practical component

Topic	Reference	Approximate (schedule)
1. Study the working and uses of trickling filters and activated sludge in treating waste water through photographs. 2. Study of biomagnification and bioconcentration and its impact on environment through photographs. 3. Study of different xenobiotic compounds (including pesticides (DDT), PAHs, heavy metals (Cr (VI) and Hg), and their effects on Environment. 4. Study of airborne microbes using settle plate method from various sites (classroom, terrace and garden). 5. Prepare compost pits using fruit peels, leaves noting the changes as well as temperature over time for biodegradation. 6. Estimate Cr(VI) concentration in water sample (through diphenylcarbazide using spectrophotometric method. 7. Detect nutrient pollution that causes eutrophication by performing colorimetric estimation of nitrate (using salicylic acid method) and phosphate (molybdenum blue method) 8. A visit to any institute/ industry/ field site to understand the uses of microbes in environmental management and a report to be submitted for the same.	1. De, A. K. (2022). Environmental Chemistry, 10th Edition, New Delhi. New Age International Pvt. Limited 2. Dennis, A., Seal, K.J., Gaylarde, C.C. (2004). Introduction to Biodeterioration, Cambridge University Press 3. Rahman, Z. Thomas, L., (2025) Industrial and Environmental Microbiology. ISBN: 9781032644769. CRC Press 4. Ahmed, N., Qureshi, F.M., Khan, O.Y. (2006). Industrial and Environmental Biotechnology, Horizon Press 5. Rochelle, P.A. (2001). Environmental Molecular Biology, Horizon Press. 6. Jadhav, H.V., Bhosale, V.M. (2015). Environmental Protection and Laws, Himalaya publishing House Pvt Ltd. 7. Trivedi, P. C. (2006). Biodiversity Assessment and Conservation, Agrobios Publ. 8. Rana, S.V.S. (2015). Environmental Biotechnology, Rastogi Publications, India.	August 2025- December 2025

