

Department of Biotechnology & Food Technology

Punjabi University, Patiala

(Established under Punjab Act No. 35 of 1961)

Syllabus for Ph.D. Entrance Test for Session 2025-26

Microbial & Food Technology

SECTION-A

(RESEARCH METHDOLOGY)

1. **Analytical Techniques:** Spectroscopy (UV-vis, NMR, IR), Spectrofluorimetry, Chromatography, Mass spectrometry, ELISA, PCR (for the detection of GM foods).
2. **Biosafety:** IBSC guidelines; Cartagena protocol; biohazards, bio-containment, risk assessment; biosafety levels.
3. **Food Laws and Food Safety:** HACCP, Codex Alimentarius, FSSAI, FSMS.
4. **Commercialization of Technology:** Concepts of TQM; ISO standards, good laboratory practices, good manufacturing practices.
5. **IPRS:** Intellectual property rights, Patent and patenting system in India; Ethical issues related to publishing, Plagiarism.
6. **Innovations in Food Technology:** Pulsed electric field technology, Cold plasma technology, Nanotechnology.

SECTION-B

(SUBJECT)

7. **Food Chemistry:** Structure of carbohydrates, lipids, and proteins, and their functionality in food, Food additives, Functional food.
8. **Food Microbiology:** Types of microbes associated with raw, processed and spoiled foods; Food poisoning and food-borne infections, Food preservation, Biopreservatives, Probiotics.
9. **Microbial Technology:** Fermented foods, Alcoholic beverages; Microbial production of food additives, organic acids, biopesticides and biofertilizers, SCP, enzymes in food industry, Upstream and downstream processing in a fermentation process.
10. **Fruits, vegetables and cereal Processing:** Processing of fruits and vegetables, effect of processing on nutrition, color and flavour, FSSAI specifications of fruit-based products, processing of cereals and cereal based products, edible oil processing.
11. **Dairy and Meat technology:** Production of different types of milks, various milk products: cream, butter, ice cream, khoa, cheese; Types of meat, slaughter stages, processing of meat, meat products.
12. **Food engineering:** Heat and Energy balances, heat transfer, fluid flow, Unit operations- evaporation, distillation, drying.