BSHND 204 : FOOD MICROBIOLOGY

Course Learning Outcomes:

- To identify various types of microorganisms on the basis of morphological, cultural and physiological characteristics
- To grasp knowledge about the microbial contamination of foods and factors affecting the growth of microorganisms
- To familiarize students about food borne infections, intoxications and role of probiotics in our daily life

Content- Theory:

1. **Food microbiology:**
   - Introduction and scope;
   - Important microbial genera in foods:
   - Bacteria,
   - Mold,
   - Yeast and yeast like fungi,
   - Viruses general,
   - Morphological,
   - Cultural and physiological characteristics;
2. **Factors affecting the growth and survival of microorganisms in food:**
   - Intrinsic,
   - Extrinsic and implicit;
   - Contamination and spoilage of perishable,
   - Semi perishable and stable foods:
   - Sources,
   - Transmission,
   - Microorganisms;
3. **Food microbiology and public health:**
   - Food-borne infections: intoxications;
   - Microbiological risk assessment;
4. **Microbiology in food sanitation:**
   - Food sanitizers and pathogen reduction a case study;
   - Food fermentation;
   - Probiotics in human health.

Content- Practical:

- Isolation, identification and characterization of microorganisms: morphology, biochemical
- Enumeration of microorganisms in food and water samples (total count, viable count, MPN);

- Examination of foods for pathogenic organisms (*Escherichia coli*, Coliform, *Salmonella* and *Listeria* monocytogenes);
- Preparation of fermented and probiotic enriched food products.

Teaching-Learning Strategies:

Teaching will be a combination of class lectures, class discussions, and group work. Short videos/films will be shown on occasion.

Assignments:

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessments and Examination:

Sessional Work: 25 marks

Midterm Exam: 35 marks

Final Exam: 40 marks

Recommended Readings:

1. Adams, M.R. & Moss, M.O. (2006). Food Microbiology. The Royal Society of Chemistry, Cambridge, UK.
2. Adams, M.R., Moss, M.O. & McClure, P. (2016). Food Microbiology. (4th ed.). Royal Society of Chemistry, Cambridge, UK.
3. Brown, M. & Stringer, M. (2002). Microbiological risk assessment in food processing. Wood head Publishing Ltd. Cambridge, UK.
4. Frazier, W.C., Westhoff, D.C. & Vanitha, K.N. (2013). Food Microbiology, (5th ed.) McGraw-Hill Book Co., New York, USA.
5. Montville, T.J., Mathews, K.R. & Kniel, K.E. (2012). Food microbiology: an introduction (3rd ed.)ASM Press, Washington DC, USA.
6. Ray, B. & Bhunia, A. (2013). Fundamentals of Food microbiology, (5th ed.) CRC Press, Taylor & Francis Group, Boca Raton, FL, USA.