SOFT CORE COURSES
BSS453 APPLIED MICROBIOLOGY

CourseOutcomes:

After successful completion of the course, students will be able to :

CO 1. Understand the applications of Microbiology in biomedical and industrial fields.
CO 2. Comprehend the beneficial and harmful interactions of microbes with other organisms.
CO 3. Use fermentation for production of ethanol, lactic acid and other industrialproducts.
CO 4. Gain theoretical knowledge of food microbiology, prevention of air- and food-bornediseasesandfood poisoning.
CO 5. Gain the basics of soil microbiology and its allied applications inagriculture.
CO 6. Know the importance of aquaticmicrobiology and learn water purification and assessment of drinking water quality.

UNIT I (13 hrs)

Microbial Ecology: Microbial symbiosis, mutualism, plant-microbe interactions (e.g. mycorrhizas), animal-microbe interactions (human, ruminants and non-ruminants). Microbes in extreme environments - hydrothermal vents and coral reefs.Microorganisms as bio-indicators. Microbial bioremediation - role in environmental management, advantages and disadvantages. Ecological implications of genetically modified microorganisms.

Fermentation: Ethanol, lactic acid, mixed acids, 2-3 butanidiol, costridial and propionic acid fermentation with emphasis on their ecological niches, merits and demerits.

UNIT II (13 hrs)

Food Microbiology: Classification of foods and oriental foods; Basic principles of food spoilage and methods of food preservation; Milk and milk products, milk microflora and their estimation, milk-borne diseases and prevention; Food poisoning, food-borne diseases and prevention.

Air Microbiology: Microflora of air and methods of their estimation, monitoring air allergens, air-borne diseases and prevention.

UNIT III (13 hrs)

Soil Microbiology: Soil microflora and methods of their estimation, role of soil microorganisms, bioconversion and decomposition. Biological nitrogen fixation (symbiotic and non-symbiotic), microbial phosphorus solubilization and their importance in soil fertility and agriculture.

Aquatic Microbiology: Microbes in water and wastewaterand methods of their estimation (e.g. MPN), drinking water microbial standards and water purification; Water-borne diseases and prevention.

References:

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