KAKATIYA UNIVERSITY
B. Sc (CBCS) Microbiology – III Year
Semester-VI – (Discipline Specific Elective)
CELL BIOLOGY

Theory syllabus

UNIT – I

1. Structure of Cell: Plasma membrane: Structure and transport of small molecules.
2. Cell Wall: Eukaryotic cell wall, extracellular matrix and cell matrix interactions, cell-cell Interactions - adhesion junctions, tight junctions, gap junctions, and plasmodesmata (only structural aspects).
3. Mitochondria, chloroplasts and peroxisomes.

UNIT - II

1. Cytoskeleton: Structure and organization of actin filaments, association of actin filaments with plasma membrane, cell surface protrusions, intermediate filaments, microtubules.
2. Nucleus: Nuclear envelope, nuclear pore complex and nuclear lamina. Chromatin – Molecular organization. Nucleolus.
3. Protein targeting and Transport

UNIT - III

1. Golgi Apparatus – Organization, protein glycosylation, protein sorting and export from Golgi Apparatus. Lysosomes.
2. Cell Signaling: Signaling molecules and their receptors. Function of cell surface receptors.
3. Pathways of intracellular receptors – Cyclic AMP pathway, cyclic GMP and MAP kinase pathway.

UNIT - IV

1. Cell Cycle, Cell Death and Cell Renewal: Eukaryotic cell cycle and its regulation, Mitosis and Meiosis.
2. Development of cancer, causes, types, Diagnosis and therapy. Programmed cell death.
3. Stem cells. Types: Embryonic stem cell, induced pluripotent stem cells.

KAKATIYA UNIVERSITY
B. Sc (CBCS) Microbiology – III Year
Semester-VI – A (Discipline Specific Elective)
CELL BIOLOGY

Practical syllabus

1. Study a representative plant and animal cell by microscopy.
2. Cytochemical staining of DNA – Feulgen.
3. Study of polyploidy in Onion root tip by colchicine treatment.
4. Identification and study of cancer cells by photomicrographs.
5. Study of cell division in onion root tip (mitotic divisions)
6. Study of different stages of Mitosis.
7. Study of different stages of Meiosis by permanent slides.

References:

1. Hardin J, Bertoni G and Kleinsmith LJ. (2010). Becker's World of the Cell. 8th edition. Pearson.
2. Karp G. (2010) Cell and Molecular Biology: Concepts and Experiments. 6th edition. John Wiley & Sons. Inc.
3. De Robertis, EDP and De Robertis EMF. (2006). Cell and Molecular Biology. 8th edition. Lipincott Williams and Wilkins, Philadelphia.
4. Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. 5th Edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.

KAKATIYA UNIVERSITY
B. Sc (CBCS) Microbiology – III Year
SEMESTER – VI - C
ENVIRONMENTAL MICROBIOLOGY

Theory syllabus

UNIT - I

1. Aero microbiology: Bioaerosols, Air borne microorganisms (bacteria, Viruses, fungi).
2. Impact of air borne microorganisms on human health and environment.
3. Significance of air borne microorganisms in food and pharma industries and operation theatres, allergens.

UNIT - II

1. Air sample collection and analysis: Bioaerosol sampling, air samplers, methods of analysis, CFU.
2. Culture media for bacteria and fungi, Identification characteristics.
3. Control measures: Fate of bioaerosols, inactivation mechanisms – UV light, HEPA filters, desiccation, Incineration.

UNIT - III

1. Water Microbiology: Water borne pathogens.
2. Water borne diseases.
3. Microbiological analysis of water: Sample Collection, Treatment and safety of drinking (potable) water.

UNIT - IV

1. Methods to detect potability of water samples: Standard qualitative procedure: presumptive test(MPN test), confirmed and completed tests for faecal coliforms
2. Membrane filter technique and Presence/absence tests.
3. Control measures:Precipitation, chemical disinfection, filtration, high temperature, UV light.

References:

1. Da Silva N, Taniwaki MH, Junqueira VC, Silveira N, Nascimento MS, Gomes RAR (2012) Microbiological Examination Methods of Food and Water-A Laboratory Manual, CRC Press
2. Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA.
3. Maier RM, Pepper IL and Gerba CP. (2009). Environmental Microbiology. 2nd edition, Academic Press.
4. Hurst CJ, Crawford RL, Garland JL, Lipson DA (2007) Manual of Environmental Microbiology, 3rd edition, ASM press.

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B. Sc (CBCS) Microbiology – III Year
SEMESTER – VI - C
ENVIRONMENTAL MICROBIOLOGY

Practical's

1. Determination of Biochemical Oxygen Demand (BOD) of sewage water
2. Determination of Chemical Oxygen Demand (COD) of industrial waste water
3.Bacteriological examination of water using multiple tube fermentation test: presumptive test, confirmed test and completed coli form test
4. Analysis of Air Microflora