



**MANGALORE UNIVERSITY**  
**DEPARTMENT OF MICROBIOLOGY**

**MSc Microbiology**

**MBS- 555: Cancer Biology**

**40h**

**OBJECTIVES**

1. To understand the causes of cancer.
2. To understand stages in cancer.
3. To learn diagnosis techniques of cancer.
4. To learn cancer therapies and treatments by microbiological approach.

**COURSE OUTCOME**

CO1: Concepts of molecular events of cancer and diagnosis.

CO2: Understanding reasons for cancer causes.

CO3: Understanding chemotherapy, side effects

CO4: Exploration of new anticancer drugs from microbes and plant-microbe interactions

CO5: Awareness towards prevention and cure of cancer.

**Unit-I**

Origin and Terminology, Cancer induction, cell transformation, genetic and environmental factors, causes and prevention, benign and malignant tumors, immortalization, metastasis, Characteristic traits, chemical carcinogenesis, Ames test, radiations, oncogenes: viruses & cellular oncogenes, tumor suppressor genes, accumulation of mutations, immune system, Evasion.

**Unit-II**

Introduction, Cell cycle progression, control points, Checkpoints, Protein phosphorylation and dephosphorylation, DNA damage, cdk subunits, Hematopoiesis, Apoptosis in normal cell and cancer cells, morphological and biochemical events, tumor suppressor p<sup>53</sup>, Fas receptor, Caspases, Angiogenesis, oxygen and nutrients supply, activators and inhibitors

**Unit -III:**

Chemotherapeutic agents, monoclonal antibodies, radioactive elements, toxic effects on cancerous and normal cells. Role of microorganisms in cancer therapy, Bioprospecting of anticancer molecules from microbial origin, antimicrobial peptides as anticancer agents, antiangiogenic compounds.

**Note: Unit 1 - 14h, Unit II & III 13h**