

**DEPARTMENT OF MICROBIOLOGY**  
**PART- II - GENERIC ELECTIVE COURSES**  
**(To be offered IN Semester –V)**

<b>19UMBGE501</b>	<b>Microbes in Human welfare</b>	<b>2hrs / week</b>	<b>2 Credits</b>
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**Course Objectives:**

The Course is designed:

1. To enable the students to understand the nature and occurrence of microorganisms.
2. To provide overview of the beneficial as well as harmful role of microorganisms in agriculture, industry, environment, health, food as well as in spoilage of useful objects

**UNIT I: Introduction to Microorganisms****8hrs**

- Definition, Brief History and scope of Microbiology,
- Groups of Microorganisms.
- Nutrition and Cultivation of microorganisms
- Isolation, purification and preservation of Microbes
- Place of microbes in the living world

**UNIT II: Microbes in Agriculture and Environment****8hrs**

- Plant Microbe interaction – PGPR and Plant pathogens
- Biofertilizer & Biopesticide
- Biodegradation & Bioremediation
- Bioleaching
- Waste water treatment, Biohazards & Microbial pollution

**UNIT III: Microbes in Industry****8hrs**

- Acid Production
- Alcohol and alcoholic beverages production
- Enzyme Production
- Antibiotics, Vaccine, interferon, antibodies.
- Single Cell Protein

**UNIT IV: Microbes in Health and Hygiene****8hrs**

- Normal flora and pathogens, Importance of personal hygiene
- Water and food borne infections
- Air borne infections
- Infections of direct contact
- Microbes as savior – Vaccine

**UNIT V: Microbes in and as food****8hrs**

- Microbes in food preparation
- Probiotics and functional foods
- Microbes as food
- Microbial spoilage of food and dairy products
- Microbes in preparation of Beverages

**Practical****8hrs.**

1. Microscopic observation of different microbes
2. Observation of microbes from natural samples

**Text Books**

- Pelczar, M.J., Chan E.C.S., Krieg, N.R., Microbiology, 5 Edition. Tata McGraw Hill Publication Co. Ltd. New Delhi.
- Modi, H.A. Elementary Microbiology - Vol -I, Akta Prakashan, Nadiyad.
- Modi, H.A. Elementary Microbiology – Vol-II, Akta Prakashan, Nadiyad.
- Tortora, Funke & Case. Microbiology-An Introduction, 8 Edition, Pearson Education, Delhi.

**Reference books**

- Stanier, R.Y., Iningraham, J.L., Wheelis, M.L., Painter, R.K. General Microbiology, 5 Edition. MacMillan Press Ltd., London
- Salle, S.J. (1974).Fundamental Principals of Bacteriology, Tata McGraw Hill Publication Co. Ltd. New DelhiKaul T N 2001. Biology and conservation of mushrooms. Oxford and IBH publishing company N.Delhi
- Frobisher M., Hinsdill, Crabtree and Goodherat Fundamentals of Microbiology, 9 Edition. W.B Saunders Co. USA.

## DEPARTMENT OF MICROBIOLOGY

### PART- II - GENERIC ELECTIVE COURSES

(To be offered IN Semester –VI)

16UMBGE02	IPR, Copyright and Patenting	2hrs / week	2 Credits
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#### Course Objectives:

This course is aimed at

- Familiarizing researchers with the nuances of Intellectual Property Rights (IPR) so as to help them integrate the IPR process in their research activities.
- To give the Students “hands- on –training” in literature, including patent search and documentation of research activities that would aid an IPR expert to draft, apply and prosecute IPR applications.
- Facilitate the students to explore career options in IPR, Copyright and Trademark

#### UNIT –1 Introduction to Intellectual Property Rights

5hrs

- What is IPR?
- Concept of Intellectual Property
- Kinds of Intellectual Property
- Economic Importance of Intellectual Property

#### UNIT –2 The International Scenario

5hrs

- The International Convention for the protection of new varieties of plants
- Outcome of Duncal’s Proposal – TRIPS – Brief account
- Introduction to Patents
- Patenting to Microbes

#### UNIT –3 Patents in India

5hrs

- Indian Patent Act - 1970
- Procedure for obtaining Patents
- Protection of Genetic Resources
- Introduction to Infringement, Infringer

#### UNIT- 4 Copyright and Trademark

5hrs

- What is copyright and Trademark?
- What is covered in copyright?
- What are Related Rights? How they are different from Copyright?
- Why to protect Copyright?

#### UNIT- 5 IPR in Science

5hrs

- IPR and Ideation
- IPR and Innovation
- Product and IPR
- Process and IPR
- IPR and Biological material

## **Practical**

1. Filling of Patent application

## **Text Books**

- T. M Murray and M.J. Mehlman, Encyclopedia of Ethical, Legal and Policy issues in Biotechnology, John Wiley & Sons 2000
- Ajit Parulekar and Sarita D' Souza, Indian Patents Law – Legal & Business Implications; Macmillan India ltd , 2006
- B.L.Wadehra; Law Relating to Patents, Trade Marks, Copyright, Designs & Geographical Indications; Universal law Publishing Pvt. Ltd., India 2000
- P. Narayanan; Law of Copyright and Industrial Designs;Eastern law House, Delhi ,2010

## **Reference books**

1. S K Roy Chaudhary & H K Saharay : The Law of Trademarks, Copyright, Patents and Design.Legal Aspects of Technology Transfer: A Conspectus
2. WIPO : WIPO Guide To Using Patent Information
3. WIPO : Intellectual Property (IP) Audit
4. WIPO : WIPO Patent Drafting Manual
5. WIPO : The Value of Intellectual Property, Intangible Assets and Goodwill