

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

<b>16UMBGE01</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:

- To enable the students to understand the nature and occurrence of microorganisms.
- 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**

**4hrs**

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

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

**5hrs**

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

**UNIT III: Microbes in Industry**

**5hrs**

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

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

**5hrs**

- Normal flora and pathogens

- Water borne infections
- Food borne infection
- Air borne infections
- Infections of direct contact
- Microbes as savior – Vaccine
- Importance of personal hygiene

#### **UNIT V: Microbes in and as food**

**4hrs**

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

#### **Practical**

**3hrs.**

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.

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

<b>16UMBGE02</b>	<b>IPR, Copyright and Patenting</b>	<b>2hrs / week</b>	<b>2 Credits</b>
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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**

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

**UNIT –2 The International Scenario**

- 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**

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

**UNIT- 4 Copyright and Trademark**

- 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**

- IPR and Ideation

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

## **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**

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