Course Focusing on Human Values and Professional Ethics

Sem.	Course Code	Core IX - Bioethics, Biosafety, TQM & IPR	Total Marks: 100		Hours / Week	Credits
II	21PBFCT204		CIA: 50	ESE: 50	5	3

Course Objectives:

To provide basic concepts and importance of biodiversity, bioethics and biosafety, TQM and IPR

Course Outcomes (CO): On completion of the course, students should be able to

CO 1	Describe the concepts of Biodiversity in India and global level	K1 - K4
CO 2	Describe the Biosafety levels of microbes, plants and animals	
CO 3	Demonstrate Ethics and Ethical issues in GMO's	
CO 4	Understand the Trade Quality Management	
CO 5	Illustrate the concepts of IPR	

K1: Remember ; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

Unit - I **Biodiversity**

Biodiversity: Introduction, levels, values, loss of biodiversity. Species concept - Classification and systematics: biological nomenclature – biological classification;

Biodiversity conservation: in situ and ex situ - Magnitude and distribution of biodiversity - wild life biology – conservation strategies – measures of biodiversity – biodiversity in India and global level – biodiversity hot spots.

Unit - II **Introduction to ethics/bioethics**

Introduction to ethics/bioethics: Framework for ethical decision making; biotechnology and ethics – benefits and risks – genetic engineering and bio warfare.

Ethical implications of cloning: Reproductive cloning, therapeutic cloning; Ethical, legal and socio-economic aspects of gene therapy

GM crops and GMO's: biotechnology and bio piracy – ELSI of human genome project.

Unit - III **Introduction to Biosafety**

Introduction to Biosafety – Biosafety issues in biotechnology – risk assessment and risk management – safety protocols, risk groups – Biosafety levels – Biosafety guidelines and regulations (National and International) – operation of Biosafety guidelines and regulations – types of Bio containments.

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Unit - IV	Total Quality Management
TQM: Principles, Tools, steps, techniques and methods for TQM (Six sigma, charts, Ishikawa diagram, tree diagram, RCA and PDCA cycle), Requirements for supplementing TQM - steps for supplementing TQM – questionnaire preparation and assessment through questionnaire, mission statement, benefits of TQM, check list for implementing TQM - Introduction to GMP and GLP.	
Unit - V	**Intellectual property rights**
IPR: protection of biotechnological inventions, patents- types, patenting of genes, biological organisms, plants, animals, microbes and transgenic organisms, trade secrets, copyright, World Intellectual Property Rights organization (WIPO), GATT (General agreement of tariff and trade), biodiversity bill of India.	

Skill Development Activities	Max. Marks (10)
Journal Review	3
e-content creation	3
Case Study	3
Punctuality	1

TEXT BOOKS	
1	Radhakrishnan R. and Balasubramanian, S, Intellectual Property Rights: Text and Cases, 1st edition. Excel Books, 2008
2	Subbaram, N. R., Viswanathan, S, Handbook of Indian Patent Law and Practice. 1st Edition. Printers and Publishers Pvt. Ltd, 1998.
REFERENCE BOOKS	
1	Krishna, V. S, Bioethics and Biosafety in Biotechnology, 1st Edition. New Age International Publishers, 2007.
2	Cohen.G, Technology Transfer. 1st Edition. Sage Publications, 2004
3	Ram Narain. Twelve management skills for success. Viva books private limited, Chennai.
4	A. Rao, L.P.Carr, I.Dambolena, R.Kopp, J.Martin, F.Rafii and P.FSchlesinger, Across functional perspectives of TQM. First Edition. John Wiley and sons, New York, 1996
5	Martin, M. W. and Schinzinger. R, Ethics in engineering, Tata McGraw-Hill, New Delhi, 4th Edition, 2004.
6	DBT guidelines, Biosafety issues related to transgenic crops, Biotech Consortium India Limited, New Delhi, 2005.

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WEB RESOURCES	
1	World Trade Organisation - http://www.wto.org
2	World Intellectual Property Organization - http://www.wipo.int
3	International Union for the Protection of New Varieties of Plants - http://www.upov.int
4	National Portal of India - http://www.archive.india.gov.in
5	National Biodiversity Authority - http://www.nbaindia.org
6	Recombinant DNA Safety Guidelines, 1990 Department of Biotechnology, Ministry of Science and Technology, Govt. of India - Retrieved from http://www.envfor.nic.in/divisions/csurv/geac/annex-5.pdf
7	Guidelines and Standard Operating Procedures for Genetically Engineered Plants, 2008 - http://www.igmoris.nic.in/guidelines1.asp

Course Designed By	Verified By	Approved By HOD
Mr. G. KARTHIKEYAN	Mr. R. RASU	Dr. A. K.VIDYA

QUESTION PAPER PATTERN

Time: 3 hours		Max. Marks: 50
SECTION-A (10 X 1 = 10 Marks) Answer ALL the questions Choose the correct answer	**SECTION-B (5 X 3 = 15 Marks)** Answer ALL the questions Either or type Two questions from each unit	**SECTION-C (5 X 5 = 25 Marks)** Answer ALL questions Question Number: 16 to 19 (Either or type) Question Number 20 is Compulsory - Case Study

Mapping of COs with POs and PSOs:

PO/PSO / CO	PO							PSO				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	S	M	S	M	S	M	S	S	S	S	M	S
CO 2	S	M	M	S	S	S	S	S	S	S	S	S
CO 3	S	M	S	M	S	M	S	S	S	S	M	S
CO 4	S	S	M	S	S	S	S	S	S	S	S	S
CO 5	S	M	M	M	S	S	S	S	S	S	M	S

S - Strong, M - Medium, L - Low

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