



Department of Biotechnology	LP: BT18011 Rev. No: 00 Date: 10.07.2024
B.E/B.Tech/M.E/M.Tech : Biotechnology Regulation: 2018A	
PG Specialisation : NA	
Sub. Code / Sub. Name : BT18011/ IPR and Ethical Issues in Biotechnology	
Unit : I	

Unit Syllabus: **ENGINEERING ETHICS****9 h**

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional Ideals and Virtues – Uses of Ethical Theories.

Objective: To impart knowledge on engineering ethics and professional practices.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Senses of Engineering Ethics	T1(1-6); T2(5-19); R1(2-5)	BB/LCD
2	Variety of moral issues	T1(8-11)	BB/LCD
3	Variety of moral issues and moral dilemmas	T1(12-14); T2(31-33)	BB/LCD
4	Moral Autonomy	T1(10-14)	BB/LCD
5	Kohlberg's theory	T1(14-16)	BB/LCD
6	Gilligan's theory	T1(17-19)	BB/LCD
7	Consensus and Controversy	T1(20-32)	BB/LCD
8	Professions and Professionalism Professional Ideals and Virtues	T1(30-46)	BB/LCD
9	Uses of Ethical Theories	T1(48-53)	BB/LCD
Content beyond syllabus covered (if any): Nil			

* Session duration: 50 minutes



Sub. Code / Sub. Name: **BT18011/ IPR and Ethical Issues in Biotechnology**

Unit : **II**

Unit Syllabus : **Engineering as Social Experimentation**

9 h

Engineering as Experimentation – Engineers as responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Case Study.

Objective: To impart knowledge on research ethics and code of ethics to be followed by engineers.

Session No *	Topics to be covered	Ref	Teaching Aids
10	Engineering as Experimentation	T1(98-105)	BB/LCD
11	Engineers as responsible Experimenters	T1(105-116)	BB/LCD
12	Research Ethics	T1(116-125)	BB/LCD
13	Codes of Ethics	T1(376-406)	BB/LCD
14	Industrial Standards	T2(225-256); R3(292-296)	BLV 1
15	A Balanced Outlook on Law	T2(268-269)	BB/LCD
16	The Challenger Case Study	T1(566-576); R3(343-352)	BB/LCD
17	Case Study	R3(370-381)	BB/LCD
18	Case Study	T1(577-579); R1(237-238)	BB/LCD
Content beyond syllabus covered (if any): NIL			

* Session duration: 50 mins



Sub. Code / Sub. Name: **BT18011/ IPR and Ethical Issues in Biotechnology**

Unit : **III**

Unit Syllabus: **Engineer's Responsibility for Safety**

9 h

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis – Reducing Risk – Risk communication, management and assessment. The Government Regulator's Approach to Risk - Chernobyl and Bhopal Case Studies. Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights

Objective: To impart knowledge on risk management and to understand importance of risk and safety assessment and analysis.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Assessment of Safety and Risk	T1(369-374); T2(110-114); R1(75-79); R3(289-291)	BB/LCD
20	Risk Benefit Analysis and Reducing Risk	T1(369-374); R3(289-291) T1(376-406); R3(289-297)	BB/LCD
21	Risk communication, management and assessment	T1(376-406); R3(289-297)	BB/LCD
22	The Government Regulator's Approach to Risk	T1(407-416); T2(119-121); R3(292-297)	BB/LCD
23	Chernobyl and Bhopal Case Studies	T1(566-576); R3(343-352)	BLV 2
24	Collegiality and Loyalty, Respect for Authority	T1(369-374); R3(289-291)	BB/LCD
25	Collective Bargaining, Confidentiality and work ethics	T1(376-406); R3(291-297)	BB/LCD
26	Conflicts of Interest	T1(407-416); R3(292-296)	BB/LCD
27	Occupational Crime, Professional and employee Rights	T1(566-576); R1(104-107); R3(343-352)	BB/LCD
Content beyond syllabus covered (if any): Risk benefit analysis of circular bioeconomy			

* Session duration: 50 mins



Sub. Code / Sub. Name: **BT18011/ IPR and Ethical Issues in Biotechnology**
Unit : **IV**

Unit Syllabus : **Intellectual Property Rights**

9 h

Intellectual Property Rights (IPR) – Discrimination. Types of IP: Patents, Trademarks, Copyright & Related Rights, Industrial Design, Traditional Knowledge, Geographical Indications - Protection of GMOs - IP as a factor in R&D - IPs of relevance to Biotechnology - Case studies on basmati rice, turmeric and neem..

Objective: To understand professional rights and responsibilities of an engineer. To impart knowledge on IPR

Session No *	Topics to be covered	Ref	Teaching Aids
28	Intellectual Property Rights (IPR)	R3(370-381)	BB/LCD
29	Discrimination	T1(577-579); R1(237-238)	BB/LCD
30	Types of IP: Patents, Trademarks, Copyright & Related Rights,	T3(14-70); O1	BB/LCD
31	Types of IP: Industrial Design, Traditional Knowledge, Geographical Indications	T3(14-70); O1	BB/LCD
32	Protection of GMOs	T3(149-158); O3	BB/LCD
33	IP as a factor in R&D	T3(139-148); T4(293-303)	BB/LCD
34	IPs of relevance to Biotechnology	T3(104-120); T3(201-211)	BB/LCD
35	Basmati Rice – Case study	R3(370-381)	BB/LCD
36	Turmeric and Neem – Case study	T1(577-579) R1(237-238); R3(353-354)	BB/LCD

Content beyond syllabus covered (if any): IP filling process in India - Overview of IP forms and procedures

* Session duration: 50 mins



Sub. Code / Sub. Name: **BT18011 / IPR and Ethical Issues in Biotechnology**

Unit : V

Unit Syllabus : **Bio-Ethics and Global Issues**

9 h

Business Ethics - Environmental Ethics – Computer Ethics - Ethical, legal and socioeconomic aspects of gene therapy, germ line, somatic, embryonic and adult stem cell research – Ethical implications of GM crops, GMO's - human genome project - Human cloning, designer babies - Biopiracy and biowarfare. – Sample Code of Conduct.

Objective: To understand global issues related to business and environmental ethics. To impart knowledge and awareness about moral leadership for engineers.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Business Ethics	T1(369-374); R3(289-291)	BB/LCD
38	Environmental Ethics & Computer Ethics	T1(376-406); R1(125-134); R3(289-297)	BB/LCD
39	Ethical, legal and socioeconomic aspects of gene therapy, germ line, somatic, embryonic and adult stem cell research - 1	T3(1-13); T4(229-242);	BB/LCD
40	Ethical, legal and socioeconomic aspects of gene therapy, germ line, somatic, embryonic and adult stem cell research - 2	T4(243-255);	BB/LCD
41	Ethical implications of GM crops	T4(121-297); O2; O3	BB/LCD
42	Ethical implications of GMOs	T3(104-120); O3	BB/LCD
43	Human genome project - Human cloning, designer babies	T3(163-172); T4(26-55)	BB/LCD
44	Biopiracy and Biowarfare	T4(468-480); O3	BB/LCD
45	Sample Code of Conduct	R3(370-381)	BB/LCD

Content beyond syllabus covered (if any): Institutional biosafety committee composition and role – DBT, GoI

* Session duration: 50 mins



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TEXT BOOKS (T)

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York, 2005.
2. Charles E Harris, Michael S Pritchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Thompson Learning, Wadworth Publisher & co, 2013.
3. Kankanala C., "Genetic Patent law & strategy", First edition, Manupatra ,Information Solution Pvt. Ltd., 2007.
4. Matthews D and Zech H, "Research Handbook on Intellectual Property and the Life Sciences", Edward Elgar Publishing, 2017

REFERENCES (R)



1. Charles D Fleddermann, "Engineering Ethics", Prentice Hall, New Mexico, 4th Edition, 2011.
2. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, 7th Edition, 2011.
3. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethic for Scientists and Engineers", Oxford University Press, 2001.
4. Prof. (Col) P S Bajaj and Dr. Raj Agrawal, "Business Ethics – An Indian Perspective", Biztantra, New Delhi, 2004
5. David Ermann and Michele S Shauf, "Computers, Ethics and Society", Oxford University Press. 2003.

OTHER READINGS (O)

1. <https://ipindia.gov.in/>
2. <https://ibkp.dbtindia.gov.in/Content/FlashPDF/IBSC%20Handbook.pdf>
3. <https://dbtindia.gov.in/regulations-guidelines/regulations/biosafety-programme>

BLENDED LEARNING VIDEOS (BLV)

1. https://youtu.be/8Wh0kB_09VI
2. <https://youtu.be/oqUATA8mvlc>

	Prepared by	Approved by
Signature		
Name	Mr.N.Sathish	Dr. E. Nakkeeran
Designation	Associate Professor	Professor & Head
Date	10.07.2024	10.07.2024
Remarks *:	-	
Remarks *:	-	

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD