AC/II(22-23).3.RUS3

S. P. Mandali's

Ramnarain Ruia Autonomous College

(Affiliated to University of Mumbai)

Syllabus for

Program: UG Biotechnology

Program Code: RUSBTK

(Credit Based Semester and Grading System for Academic Year 2023–2024)

GRADUATE ATTRIBUTES

GA	Description **A student completing Bachelor's Degree in Science program will be able to:**
GA 1	Recall and explain acquired scientific knowledge in a comprehensive manner and apply the skills acquired in their chosen discipline. Interpret scientific ideas and relate its interconnectedness to various fields in science.
GA 2	Evaluate scientific ideas critically, analyse problems, explore options for practical demonstrations, illustrate work plans and execute them, organise data and draw inferences.
GA 3	Explore and evaluate digital information and use it for knowledge upgradation. Apply relevant information so gathered for analysis and communication using appropriate digital tools.
GA 4	Ask relevant questions, understand scientific relevance, hypothesize a scientific problem, construct and execute a project plan and analyse results.
GA 5	Take complex challenges, work responsibly and independently, as well as in cohesion with a team for completion of a task. Communicate effectively, convincingly and in an articulate manner.
GA 6	Apply scientific information with sensitivity to values of different cultural groups. Disseminate scientific knowledge effectively for upliftment of the society.
GA 7	Follow ethical practices at work place and be unbiased and critical in interpretation of scientific data. Understand the environmental issues and explore sustainable solutions for it.
GA 8	Keep abreast with current scientific developments in the specific discipline and adapt to technological advancements for better application of scientific knowledge as a lifelong learner

PROGRAM OUTCOMES

PO	Description **A student completing Bachelor's Degree in Science program in the subject of Biotechnology will be able to:**
PO 1	Adept in basic sciences along with a thorough understanding of biotechnology principles and chemical sciences to create a foundation for higher education with the insights into interdisciplinary approach.
PO 2	Demonstrate the applications of fundamental biological processes from the molecular, cellular, industrial and environmental perspective.
PO 3	Develop effective communication skills with improved individual and team work abilities in the domain of scientific research writing. Showcase their innovative ideas and research work efficiently.
PO 4	Reflect, analyse and interpret information or data for investigating the problem in fields of biotechnology. Acquire scientific and entrepreneur skills to furnish sustainable solutions to coeval problems
PO 5	Illustrate the relevance of ethical implications and standard laboratory practices in tissue culture techniques, forensic biology, developmental biology and other fields of biotechnology.
PO 6	Apply the conceptual knowledge to develop coherent, efficacious and proficient practical, technical and analytical skills.

PROGRAMME OUTLINE

YEAR	SEMESTER	PAPER	COURSE CODE	COURSE TITLE	CREDITS
FYBSc I	I		RUSBTK.O101	Biotechnology I- Fundamentals of biotechnology	3
			RUSBTKP.O101	Practicals based on Biotechnology I- (Fundamentals of biotechnology)	1
			RUSBTK.O102	Fundamentals of chemistry for biotechnology	3
			RUSBTKP.O101	Practicals based on Fundamentals of chemistry for biotechnology	1
		GE	RUSGEBTK.O101	IPR-I	2
		VSE	RUSVSCBTK.O101	Techniques of forensic science - I	1
			RUSVSCBTKP.O101	Practicals of VSE	1
		SEC	RUSSECBTK.O101	Microscopy and microbial techniques	1
			RUSSECBTKP.O101	Practicals of SEC	1
FYBSc I	II		RUSBTK.E111	Biotechnology II- Fundamentals of genetics	3
			RUSBTKP.E111	Practical of Biotechnology-II	1
			RUSBTK.E112	Bioorganic chemistry	3

			RUSBTKP.E112	Practical of subject 2	1
		GE	RUSGEBTK.E111	IPR-II	2
		VSE	RUSVSCBTK.E111	Techniques in forensic science -II	1
			RUSVSCBTKP.E111	Practicals of VSE	1
		SEC	RUSSECBTK.E111	Techniques in tissue culture	1
			RUSSECBTKP.E111	Practicals of SEC	1

Course Code: RUSGEBTK.O101
Course Title: IPR - I
Academic year 2023-24

COURSE OUTCOMES:

COURSE OUTCOME	CO DESCRIPTION
CO 1	Describe various international agreements on Intellectual property rights .
CO 2	Elaborate on the rules and regulations for patenting
CO 3	Distinguish between copyright, Trademark, GI and Industrial designs
CO 4	Correlate different case in biotechnology with laws.

DETAILED SYLLABUS

Course Code	Unit	Course/ Unit Title	Lectures
	I	**Introduction to Intellectual Property** Introduction to IPR; Globalization & development of GATT, WTO, TRIPS agreement; Important Provisions under TRIPS (Article/s 3, 4, 31/31f) agreement; Important provisions under Geographical indications act, PVPFRA; Traditional knowledge and Bio-piracy; Differences among copyright, Trademark, GI and Industrial designs; Classification of trademark; conventional v/s non-conventional.	

	II	**Concept of 'prior art'** Indian Patents Act 1970 And Rights Of Patentee(section 48),Principles Of Patent Protection(sec83);Patenting biotech inventions: objectives, concept of novelty, concept of inventive step, non-patentable objects (sec 3/4), Budapest treaty and protection of micro organisms, moral issues in patenting biotech inventions; Important case law under Biotechnology; Harvard onco-mouse case, Diamon vs Chakrabarty case, Turmeric case, Hoodia cactus case, Patent databases and patent search. International patent classification (https://www.wipo.int/classifications/ipc/en) Analysis and report formation, Digital IPR acr	

Course Title: IPR - II
Academic year 2023-24

COURSE OUTCOMES:

COURSE OUTCOME	CO DESCRIPTION
CO 1	Elaborate on the rules and regulations for patenting
CO 2	Interpret different case laws in biotechnology
CO 3	Discuss the roles and responsibilities of the patent officer and the institution
CO 4	Examine different patent applications .
CO 5	Summarise different case studies associated with Intellectual Property Rights

DETAILED SYLLABUS

Course Code	Unit	Course/ Unit Title	Lectures
	I	**Patent filing and Infringement.** Patent application- forms and guidelines, fee structure, time frames; Types of patent applications: ordinary patent application (provisional and complete specifications, timeline); PCT (timeline) and conventional patent applications; Patent-of-addition v/s divisional patent, publication of patents-gazette of India,statusinEuropeandUS.Partsofapatent;How to write a claim, types of claims (independent v/s dependent claims, Markush claims, Omnibus claims, biotechnology claims, etc.), Patenting by research students, lecturers and scientists University/organizational rules in India and abroad, credit/royalty sharing by workers and financial incentives. Patent infringement- meaning, scope, litigation, case studies and examples. Important case studies: Glivec case (section 3d), Natco v/sBayer case of compulsory licensing	**15**

	II	**Important aspects of IP protection** IP transfer, patent filing, types of patent, types of claim claim drafting, patent search. Exhaustion doctrine an article 6 of TRIPS agreement in conjunction with sec 48 o Indian patents act 1970; case studies; fair dealing and d minimis principle. IP enforcement (proactive vs reactiv measures):-civil, criminal and custom remedies.Article 3 of TRIPS agreement. Legislative structure and IP protectio in India, role of IPAB. Copyright protection: Rights copyright owner (sec14, economic rights; sec 57, mor rights),Contract of service v/s Contract for service(sec17) idea-expression dichotomy under Indian copyright act 1957; spring-board doctrine, doctrine of first-sale andCreative commons (CC). Levels of trademark protection (based on trade name). Passing off v/s trademarks infringement	**15**

MODALITY OF ASSESSMENT

GE

Theory Examination Pattern

Internal assessment -40%- 20 Marks

Sr.No	Evaluation Type	Marks
1	**Class test/Assignment**	**20**
	Total Marks	**20**

B) External examination 60 %: 30 marks

Semester End Theory Assessment - 30 marks

I. Duration - These examinations shall be of 1 hour duration.

II. Paper Pattern:
1. There shall be 02 questions each of 15 marks. On each unit there will be one question.
All questions shall be compulsory with internal choice within the questions.
2. 60% options will be provided.

Questions	Options	Marks	Questions from
Q1	a. Objectives (1M each) any 3 out of 4 b. Brief Answer(4M each) any 3 out of 4	3 12	Unit 1
Q2	c. Objectives (1M each) any 3 out of 4 d. Brief Answer(4M each) any 3 out of 4	3 12	Unit 2