AC/II(23-24).2.RUS3

S. P. Mandali's

Ramnarain Ruia Autonomous College

(Affiliated to University of Mumbai)

RUIA COLLEGE
Explore • Experience • Excel

Syllabus for

Program: UG Biotechnology

Program Code: RUSBTK

(Credit Based Semester and Grading System for Academic Year 2024–2025)

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**	DSC	RUSBTK.O101	Biotechnology I- Fundamentals of biotechnology	3
		DSC	RUSBTKP.O101	Practicals based on Biotechnology I- (Fundamentals of biotechnology)	1
		DSC	RUSBTK.O102	Fundamentals of chemistry for biotechnology	3
		DSC	RUSBTKP.O101	Practicals based on Fundamentals of chemistry for biotechnology	1
		OE	RUSOEBTK.O101	Fitness - I	3
		OE	RUSOEBTKP.O101	Practicals based on Fitness - I	1
		VSC	RUSVSCBTKP.O101	Marine Biotechnology	2
		SEC	RUSSECBTKP.O101	Microscopy and microbial techniques	2
FYBSc	II	DSC	RUSBTK.E111	Biotechnology II- Fundamentals of genetics	3
		DSC	RUSBTKP.E111	Practical of Biotechnology-II	1
		DSC	RUSBTK.E112	Bioorganic chemistry	3

I		DSC	RUSBTKP.E112	Practical of subject 2	1
		OE	RUSOEBTK.E111	Fitness - II	3
		OE	RUSOEBTKP.E111	Practicals based on Fitness - II	1
		VSC	RUSVSCBTKP.E111	Techniques in forensic science	2
		SEC	RUSSECBTKP.E111	Techniques in tissue culture	2

SEMESTER I

Course Code: RUSVEC.O101
Course Title: Value Education Course (VEC)
Environmental Science
Academic year 2023-24

COURSE OUTCOMES:

COURSE OUTCOME	DESCRIPTION
CO 1	Understand the importance of the concepts of ecology and environment
CO 2	Understand different approaches to ecology and the principles associated with it
CO 3	Gain insights into the concept of environmental degradation and its impact on human life
CO 4	Students realize the need of their role to actively participate and contribute to environmental protection and sustainable development
CO 5	Comprehend the concept of disasters and how disasters can be managed in India and To lead and create a conducive living atmosphere to self and others.

DETAILED SYLLABUS

Course Code/ Unit	Unit	Course/ Unit Title	Credits/ Lectures
RUSVEC.O101	**I - II**	**ENVIRONMENTAL SCIENCE**	**2/30**
	I	**Approaches to Understanding Ecology**	**15**
		1. Concept of Ecology and Environment 2. Approaches to ecology - Anthropocentrism,	

		Biocentrism and Eco centrism, Ecofeminism and Deep Ecology 3. Environmental Principles – Sustainability principle, Polluter Pays principle, The Precautionary principle, The Equity principle	
	II	**Dealing with Environmental Concerns**	**15**
		1. Environmental Degradation – Causes and Impact on Human Life 2. Sustainable Development – Concept and Components 3. Disaster Management - Prevention, Mitigation and Disaster Preparedness	
	Total		**30**

References:

1. Biju, M.R., *Human Rights in a Developing Society*, Mittal Publications, New Delhi, 2005.

2. Dreze, Jean and Sen Amartya, *India: Economic Development and Social Opportunity*, Oxford University Press, Oxford, 1998.

3. Goel, S.L., *Encyclopaedia of Disaster Management,* Vol. I, II & III; Deep and Deep Publications Pvt. Ltd., New Delhi, 2006.

4. Guha, Ramchandra and Gadgil, Madhav, (eds.), *Ecology and Equity: The Use and Abuse of Nature in The Contemporary India*, Routledge, 1995.

5. Mohapatra, Gaur Krishna Das, *Environmental Ecology,* Vikas, Noida, 2008.

6. Motilal, Shashi, and Nanda, Bijoy Lakshmi, *Human Rights: Gender and Environment,* Allied Publishers, New Delhi, 2007.

7. Murthy, D. B. N., *Disaster Management: Text and Case Studies,* Deep and Deep

Publications, New Delhi, 2013.

8. Parsuraman, S., and Unnikrishnan, (eds.), *India Disasters,* Report II, Oxford, New Delhi, 2013

9. Reza, B. K., *Disaster Management*, Global Publications, New Delhi, 2010.

10. Sharma, P.D., *Ecology and Environment,* Rastogi Publications, 2015.

11. Shiva, Vandana, *Ecology and the Politics of Survival: Conflict over Natural Resources in India,* Sage Publications, California, 1991.

12. Shiva, Vandana, *The Violence of the Green Revolution*, University of Kentucky Press, Kentucky, 2016.

Books in Marathi

1. Pawar, Dr. Kishor, Dr. Nalini, *Paryavaranshastra,* Nirali Prakashan, Pune, 2017.

2. Raut, Dr. P. D, *Paryavaran Abhyas,* Shivaji University, Kolhapur, 2022.

3. Vyavahare, Ramanand, *Shashwat Vikas*, Educational Publishers, Aurangabad.

MODALITY OF ASSESSMENT

Theory Examination Pattern:

A) Internal Assessment - 40% : 20 marks.

(Class Test)

B) External Examination - 60 % : 30 marks.

1. Semester End Theory Assessment - 30 marks

i. Duration - This examination shall be of **1 Hour** duration.

(Two Questions of 15 marks each/Three Questions of 10 Marks each)

Overall Examination and Marks Distribution Pattern

RUSVEC.O101	**Semester I**		
	Internal	**External**	**Total**
Theory	**20**	**30**	**50**