

Resolution No: AC/II(23-24).2.RUS1

S. P. Mandali's
Ramnarain Ruia Autonomous College
(Affiliated to University of Mumbai)



Syllabus For:
Program: Integrated M.Sc. in Bioanalytical
Sciences
(F.Y.B.Sc. Syllabus)
Program Code: RUSBAS

As Per Guidelines of National Education Policy 2020 -Academic Year 2024-25

(Choice Based Credit System)

GRADUATE ATTRIBUTES

GA	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
PO 1	A student completing Bachelor's Degree in Science program in the subject of Bioanalytical Sciences will be able to: This course will impart high quality science education in a vibrant academic ambience with the faculty of distinguished teachers and scientists.
PO 2	It will also equip students for the future who will take up the challenge of doing quality research & teaching and also contribute to industrial production and R & D in the fields of Bioanalysis, Bioinformatics and Nutraceutical Sciences.
PO 3	It will amalgamate classical analytical chemical techniques with modern genomic and proteomic technologies of manufacturing and analysis to better characterize the products useful as medicines as well as nutraceuticals.

Ability Enhancement Course- RUSAECBAS.O101

Course Title: Indian Knowledge system

Academic Year 2024-25

F.Y.B.Sc.

COURSE OUTCOMES:

COURSE OUTCOME	DESCRIPTION
CO 1	Creating awareness amongst the students about the history and cultural heritage of our country.
CO 2	Explain the scientific value of the traditional Indian knowledge.
CO 3	Elaborate on the various research in the various fields of Indian knowledge system.
CO 4	Learn on how to Transform Indian wisdom into an applied aspect of modern scientific paradigm.

Paper Code	Semester I	Credits/Hours
RUSAECBAS.O101	Indian Knowledge system	2/30
107.1	Ancient Indian Education and Thought System	15
	A. Indian Knowledge System- Meaning, Concept and Importance B. Ancient Indian Education System – <i>Gurukula</i> Tradition and Ancient Indian Universities C. Ancient Indian Religious, Political and Economic Thought	
107.2	Art, Science and Technology in Ancient India	15
	A. Ancient Indian Language, Literature and Aesthetics B. Ancient Indian Art and Architecture C. Ancient Indian Sciences, Technology and Medical Tradition - Ayurveda	

Reference Books:

<p>Indian Knowledge system</p>	<ol style="list-style-type: none"> 1. Chauhan, B. C., Textbook on The Knowledge System of Bhārata, Garuda Prakashan Pvt. Ltd. 2. History of Science in India Volume-1, Part-I, Part-II, Volume VIII, by Sibaji Raha, et al. National Academy of Sciences, India and The Ramkrishan Mission Institute of Culture, Kolkata, 2014. 3. Pride of India- A Glimpse of India's Scientific Heritage edited by Pradeep Kohle et al. Samskrit Bharati, 2006. 4. Vedic Physics by Keshav Dev Verma, Motilal Banarsidass Publishers, 2012. 5. India's Glorious Scientific Tradition by Suresh Soni, Ocean Books Pvt. Ltd., 2010. 6. Altekar, Anant Sadashiv, Education in Ancient India, Isha Books, 2009. 7. Bhardwaj, Hari C., Aspects of Ancient Indian Technology. N.p., Motilal Banarsidass, 1979. 8. Chattopadhyaya, Debiprasad. History of Science and Technology in Ancient India: Formation of the theoretical fundamentals of natural science. India, Firma KLM, 1986. 9. Kosambi, Damodar Dharmanand, The Culture and Civilisation of Ancient India in Historical Outline, Vikas Publication, 1994. 10. Sharma, Ram Sharan. Aspects of Political Ideas and Institutions in Ancient India, Motilal Banarsidass, 1991. 11. Singh, Sahana, The Educational Heritage of Ancient India: How an Ecosystem of Learning Was Laid to Waste, Notion Press, 2017. 12. Soni Suresh, India's Glorious Scientific Tradition, Ocean Books Pvt. Ltd. 2010. 13. Rowland, Benjamin. The Art and Architecture of India: Buddhist, Hindu, Jain. United Kingdom, Penguin Books, 1970.
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Ability Enhancement Course - RUSAEC.E 111

Course Title: Environmental Sciences

Academic Year 2024-25

F.Y.B.Sc.

COURSE OUTCOMES:

COURSE OUTCOME	DESCRIPTION
CO 1	Realize the significance and applications of natural resources.
CO 2	Deal with natural and manmade disasters & learn to get acquainted with the environmental statements

Paper Code	Semester II	Credits/Hours
RUSAEC.E 111	Environmental Sciences	2/30
1	Environment: An overview and Natural Resources	10
	1. Environment – Structure and components – Topology – Natural and Human. 2. Ecosystem as part of Environment – Functioning and levels of organization – Linkage with society and economy. 3. Emerging issues of development – Environment as a source and depository of resources, products and waste. 4. Sustainable use of resources – a multidisciplinary approach – importance of Environmental Studies. 5. Definition, importance and classification of natural resources. 6. Resource rich and resource poor regions – emerging gaps 7. Distribution patterns, utilization and conservation of water, forest and energy resources	
2	Disaster – Natural and Man-made & Environmental issues and Movements	10
	1. Concept of disaster – Natural and man-made 2. Natural hazard/Disasters: Causes and Consequences – Earthquake and Tsunami, Cyclone, Flood and Drought (a case study) 3. Man-made disasters – Causes and Consequences – nuclear accident, oil spill and leakage, industrial accident 4. Disaster Management cycle – Pre-disaster, disaster occurrence and post-disaster- Role of technology 5. Environmental problems – Causes and Effects	

6. Global issues – Global climate changes, Threats to Biodiversity, tremendous pollution, population and ozone depletion (a case study)	
7. Regional issues – Acid rain, Desertification (a case study)	
8. Major environmental movements in India	
3 Environmental Management	10
1. Environmental management – concept and need – relevance of Environmental education	
2. Constitutional and legal provisions in India – International efforts towards environmental protection – role of WTO	
3. Environmental Statement, ISO 14000, ISO 16000, Environmental Impact Assessment	
4. Role of technology in environmental management (GIS, GPS, Remote sensing as tools)	
5. Carbon bank and Carbon credit	

Reference Books:

Environmental Sciences	<ul style="list-style-type: none"> • Dr. Y. K. Singh: Environmental Science • Abhijit Mitra, Tanmay Ray Chaudhari: Basics of Environmental Science
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