बिरसा मुंडा ट्रायबल युनिवर्सिटी
Birsa Munda Tribal University
राजपिपला, जि॰ नर्मदा Rajpipla, Dist. Narmda
Established by Tribal Development Department, Govt. of Gujarat

School of Science
B.Sc. (Chemistry) Programme
Subject Code & Name: - BS04MICHE2 Basics of Nuclear Chemistry

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage (%)			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
3	-	1	4	35	15	35	15

Programme Name	B.Sc.
Semester	IV
Course Code	BS04MICHE2
Course Title	Basics of Nuclear Chemistry
Course Content Type (Th./Pr.)	Theory & Practical
Course Credit	3 + 1
Sessions+ Lab. Per Week	3 +2
Total Teaching/Lab. Hours	45 Theory Hours + 30 Practical Hours
* 2 Laboratory = 1 Session	

Learning Objectives

1. It involves understanding the nucleus, radioactivity, nuclear reactions and their applications.
2. Students should be able to explain the concepts of nuclear stability, radioactive decay and the different types of nuclear reactions
3. Students should be able to calculate energy release and understand the practical applications of nuclear chemistry in various fields.

Prerequisites (if any)

Learning Outcomes

On the Completion of this course, students will able to:

1. Students will be able to describe the structure of the nucleus understand the concept of isotopic stability and explain the band of stability.
2. Students will be able to use proper isotopic notation to write and balsance nuclear reactions equations.

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3. They will understand the concept of rate of change and half-life in the context of nuclear decay.
4. They will understand the biological effects of radiation exposure and the importance of radiation protection.

Detailed Contents

UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	**Radioactivity** Radioactivity, Types of radiations, Properties of radiations, Detection and measurement of radioactivity, Types of radioactive decay	15
II	**Radioactive Displacement** The group displacement law, Radioactive Disintegration series(Including Trans-Uranic Elements), Rate of radioactive decay, Half-life, Radioactive dating	15
III	**Nuclear Reactions** Nuclear reactions, nuclear fission reactions, nuclear fusion reactions, Nuclear Equations, Artificial Radioactivity, Nuclear isomerism, Mass defect, nuclear binding energy, nuclear chain reaction, nuclear energy, solar energy	15

Text Book(s)

Reference Books

1. Essential of Physical Chemistry by Arun Bahl, B S. Bahl and G D Tuli, S Chand & Company limited
2. Essential of Nuclear chemistry by Harijeevan Arnikar , New Age International Publishers
3. Nuclear chemistry through problems by Harijeevan Arnikar & N S Rajurkar , New Age International Publishers

Web Resources

1. Google books, INFLIBNET, Google Web

Required Software(s) (if any)

Practical(s)

Nuclear Chemistry Practical 1. Simulating radioactive decay using dice 2. Questions and answering by video presentations of nuclear chemistry	30

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L:: Lecture, **T::** Tutorial , **P::**Practical

CCE:: Continuous and Comprehensive Evaluation

(CCE Theory includes Mid Semester Examination, Assignment, MCQ quizzes, Seminar, Reflective notes, class participation, case analysis and presentation, slip tests (announced/ surprised), attendance etc. or any combination of these)

PWE:: Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)

SEE:: Semester End Evaluation