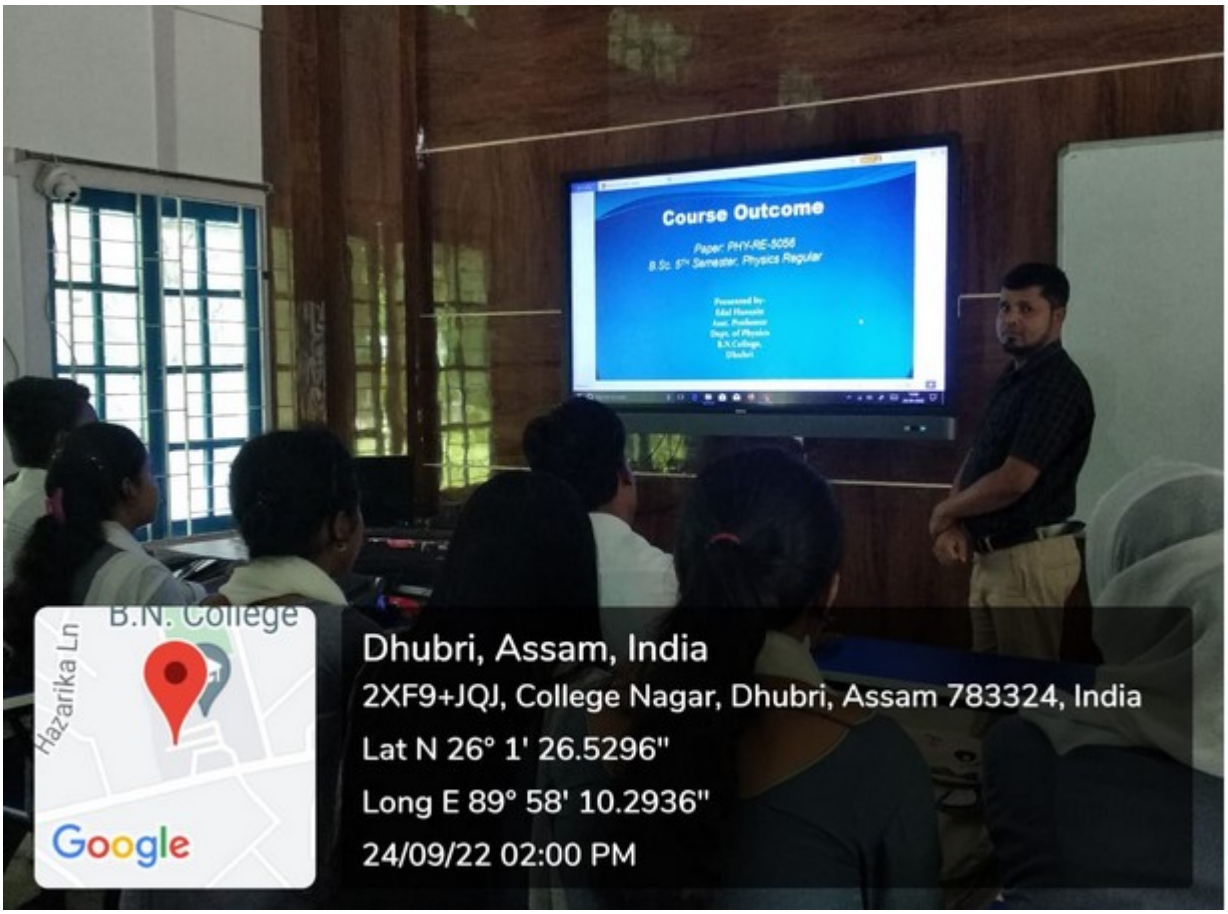
Report on Course Outcome Class
B.Sc.5th Sem. Physics (RE)
Paper Name: Nuclear and Particle Physics
Paper Code: PHY-HE-5056
Class taken on: 24th September 2022
Class taken by: Edal Hussain, Asst.Prof. Dept. of Physics, B.N.College, Dhubri

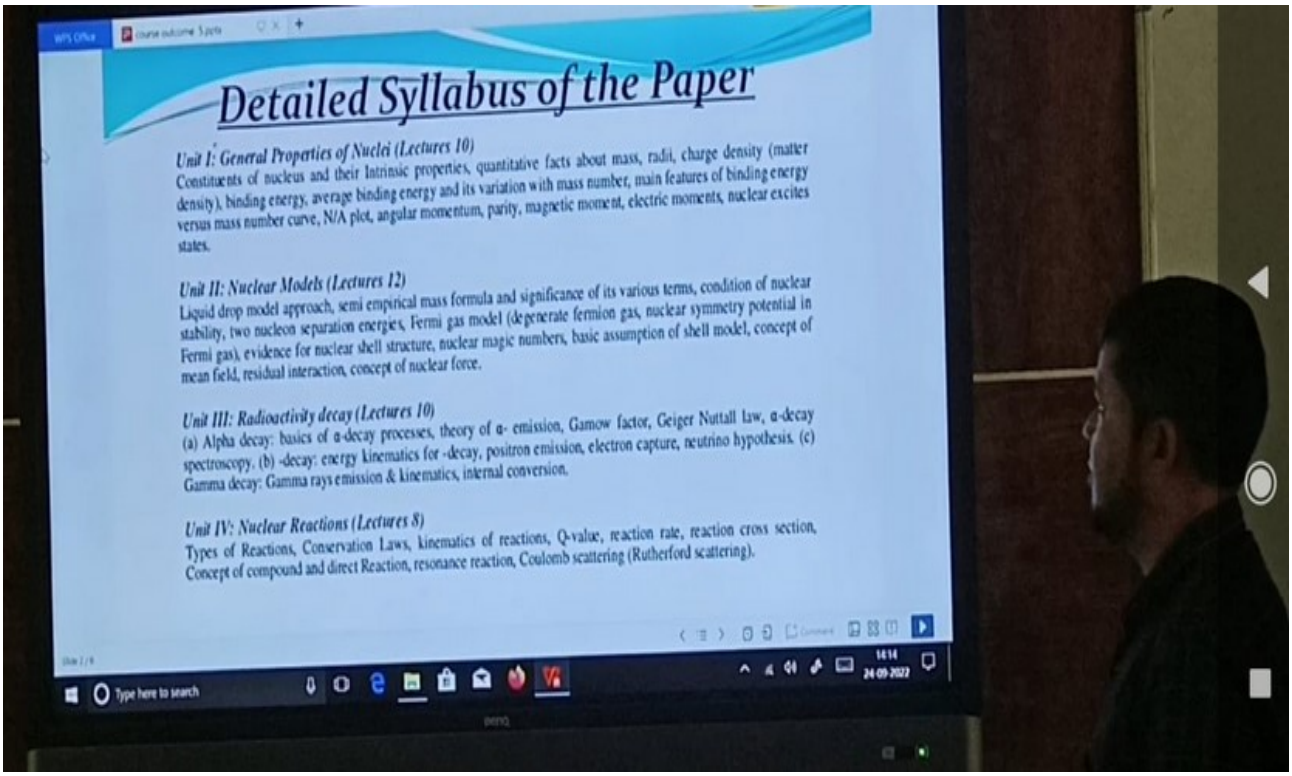
The course outcome class for B.Sc. 5th semester (Regular Elective) class was taken on 24th September 2022, before commencement of the formal class as per syllabus. In this class the course outcome of the paper "Nuclear and Particle Physics" was discussed among the students. Total 19 students participated the class. The summary of the course outcome of the course that has been conveyed to the students is given below.

Course Outcome

Upon completion of this course, students will have the understanding of the sub atomic particles and their properties. They will gain knowledge about the different nuclear techniques and their applications in different branches of Physics and societal application. The course will develop problem based skills and the acquire knowledge can be applied in the areas of nuclear, medical, archeology, geology and other interdisciplinary fields of Physics and Chemistry.

A Few snapshots of the class

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Course outcome 5.pptx
Detailed Syllabus of the Paper
Unit I: General Properties of Nuclei (Lectures 10)
Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states.
Unit II: Nuclear Models (Lectures 12)
Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force.
Unit III: Radioactivity decay (Lectures 10)
(a) Alpha decay: basics of α-decay processes, theory of α- emission, Gamow factor, Geiger Nuttall law, α-decay spectroscopy. (b) -decay: energy kinematics for -decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion.
Unit IV: Nuclear Reactions (Lectures 8)
Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering).
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