ASSAM ROYAL GLOBAL UNIVERSITY

Course/ Program: Pre –Phd, Course Work **Semester: Paper III**
Subject: Nonlinear optics. **L-T-P-C: 3-0-0-3**
Subject Code:

Detailed Syllabus:

Modules	Topics / Course content	Hours	Marks
I	Introduction to non-linear optics, nonlinear response, Descriptions of Nonlinear Optical Processes, Properties of the Nonlinear Susceptibility, Stimulated Scattering Processes, Stimulated Raman scattering process, Stokes–Anti-Stokes Coupling in Stimulated Raman Scattering. Coherent Anti-Stokes Raman Scattering.	**10**	**25**
II	General description of wave propagation in nonlinear media. Wave equations for non-linear medium, Coupled Wave Equation, Self-Focusing of Light, Pulse Propagation and Temporal Solitons	**10**	**25**
III	Phase matching, Quasi-Phase-Matching. Sum- and difference frequency generation, parametric amplification and optical parametric oscillators, Self and Cross Phase Modulation, Four-Wave Mixing in Photorefractive Material, Optical Phase Conjugation.	**10**	**30**
IV	Sensor Characteristics and Principles Sensor Classification - sensor characteristics - Physical principles of sensing - electric charges, fields, and potentials, Dynamic Models of Sensor Elements.	**10**	**20**
Total		**40**	**100**

Text

1, *Non-Linear Optics*; R.W. Boyd; Elsevier, Third edition (2008)

Reference Books:

1. Y.R. Shen, *Principles of Non-linear Optics;* Wiley Classics Library *(2002)*
2. G.D. Baruah, *Essentials of Non-linear Optics and Lasers*, Pragati Prakashan. (2009)