**HUMAN GENETICS 5TH SEMESTER (CBCS)**

**DISCIPLINE SPECIFIC ELECTIVE (Paper 1)**

**Course Title: Protein Biosynthesis**

**Course Code: DSE – HG-501**

**Unit 1: Genetic code**

1.1 History of deciphering genetic code

1.2 Characteristics of Genetic code

1.3 Wobble hypothesis

1.4 Natural variations in Genetic code

**UNIT 2: Ribosome and tRNA**

2.1 Ribosome - Structure and chemical composition in prokaryotes

2.2 Ribosome - Structure and chemical composition in eukaryotes

2.3 rRNA genes - Role of nucleolus, processing of rRNA in eukaryotes

2.4 tRNA : structure and types, activation of tRNA

**UNIT 3: Translation – I**

3.1 Concept of cistron – Monogenic and Polygenic cistron

3.2 Mechanism of translation in prokaryotes

3.3 Mechanism of translation in eukaryotes

3.4 Inhibition of protein synthesis (antibiotics and toxins)

**UNIT 4: Translation – II**

4.1 Proof reading and energy cost of fidelity in protein synthesis

4.2 Post translational modification

4.3 Role of protein in heredity (Inborn error in metabolism)

4.4 One gene one polypeptide hypothesis (sickle cell anaemia)

**PRACTICALS**

1. Framing of coding dictionary
2. Protein estimation by Lowry’s method
3. Polyacrylamide gel Electrophoresis
4. Study of secondary structure of protein through model/chart (alpha helix, β–pleated sheet)
5. Major categories and chemical structure of 20 aminoacids found in living organisms