

| <b>LS 425A</b> <span style="margin-left: 150px;"><b>Molecular Biology</b></span> <span style="float: right;"><b>3 Credits</b></span> |   |                                |
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| Name of the Faculty: Prof. P.C. Rath*, Prof. K. Natarajan, Prof. P.K. Verma  |   |                                |
| Sr.No.   | Topic   | Faculty Name/<br>Contact Hours |
| 1  | Introduction to Molecular Biology   | PCR/1                          |
| 2  | DNA and RNA: Structure, Conformation and Topology                                 | PCR/2                          |
| 3  | Denaturation & Renaturation of DNA and Hybridization                              | PCR/3                          |
| 4  | Chromatin Structure and Organization  | PKV/3                          |
| 5  | Structural Organization of Genes and Genomes                                      | PKV/2                          |
| 6  | Enzymology and Mechanism of DNA replication                                       | KN/2                           |
| 7  | DNA Replication: Replicon model; Replication origin                               | KN/1                           |
| 8  | Regulation of DNA replication-Prokaryotes and Eukaryotes                          | KN/1                           |
| 9  | Cell cycle and chromosome replication   | KN/1                           |
| 10   | Chromatin reassembly after chromosome replication                                 | KN/1                           |
| 11   | End replication problem; Telomere and telomerase                                  | KN/1                           |
| 12   | Eukaryotic transcription: Basal transcription machinery and promoter architecture | KN/1                           |
| 13   | RNA Pol II structure; RNA pol II CTD  | KN/1                           |
| 14   | Mediator complex; CTD Code; Chromatin remodeling                                  | KN/1                           |
| 15   | Coactivators; Coregulators; Transcription regulators/Activators                   | KN/1                           |
| 16   | Regulation of Eukaryotic Transcription  | KN/1                           |
| 17   | Transposable elements   | PKV/2                          |
| 18   | Mutation and DNA Repair   | PKV/3                          |
| 19   | DNA recombination   | PCR/2                          |
| 20   | RNA Replication and “RNA world”   | PCR/2                          |
| 21   | Types of RNA and RNA Processing   | PCR/3                          |
| 22   | Genetic Code and Translation  | PCR/4                          |

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|----|---|-------|
| 23 | Regulation of Prokaryotic Gene Expression | PKV/3 |
| 24 | Epigenetics and Epigenome                 | KN/1  |
| 25 | RNA Interference and Gene Silencing       | KN/1  |

**Suggested reading:**

1. Molecular Biology of the Gene (Watson et al.) 7<sup>th</sup> Edition.
2. Molecular Cellular Biology (Lodish et al.) 6<sup>th</sup> Edition.
3. Molecular Biology of the Cell (Alberts et al.) 5<sup>th</sup> Edition.