**MOLECULAR BIOLOGY-I CREDIT HOURS2+1**

**LEARNING OUTCOMES:**

**Students will be able to:**

1. Recognize the comparison of prokaryotic and eukaryotic genes and genomes.
2. Know about molecular genetics and how DNA and RNA work

**COURSE CONTENTS:**

Introduction to molecular biology and history; Chemical and physical properties of nucleic acids, The structure and function of DNA, RNA and Proteins; prokaryotic and Eukaryotic genes and genome, DNA packaging in chromatin and regulation of chromatin structure; Structure of chromosomes; Evolution of genomes (nuclear and organelle genome); Central dogma of molecular biology; DNA replication; Transcription; Translation; DNA repair including description of types of DNA damage, various DNA polymerases and different types of repair; DNA recombination; Transposable DNA elements.

**PRACTICALS:**

1. Extraction and purification of nucleic acids from different sources (bacteria, blood, plants, animal tissues) etc.
2. Qualitative and quantitative analysis of nucleic acids

**RECOMMENDED BOOKS:**

1. Allison, L.A., 2011. Fundamental Molecular Biology.2nd Edition. WileySons.
2. [Gerald Karp](http://eu.wiley.com/WileyCDA/Section/id-302479.html?query=Gerald+Karp),G., [Janet Iwasa](http://eu.wiley.com/WileyCDA/Section/id-302479.html?query=Janet+Iwasa),J., [Wallace Marshall](http://eu.wiley.com/WileyCDA/Section/id-302479.html?query=Wallace+Marshall),W., 2016. Karp's Cell and Molecular Biology, 8th Edition .John Willey and Sons, Inc.
3. [Kormann](http://www.intechopen.com/books/editor/modern-tools-for-genetic-engineering), M.S.D., 2016. Modern Tools for Genetic Engineering. Publisher: **InTech**Janeza Trdine 951000 Rijeka, Croatia - European Union.
4. [Kormann](http://www.intechopen.com/books/editor/modern-tools-for-genetic-engineering),M.S.D., 2016. Modern Tools for Genetic Engineering. Publisher: InTech Janeza Trdine 951000 Rijeka, Croatia - European Union.
5. [Larramendy, M.L., and Soloneski](http://www.intechopen.com/books/editor/nucleic-acids-from-basic-aspects-to-laboratory-tools),S., 2016. Nucleic Acids From Basic Aspects to Laboratory Tools Publisher: InTech,Janeza Trdine 951000 Rijeka, Croatia - European Union.
6. Lodish., H., Berk,A., Kaiser, C.A. M. Krieger, M., Bretscher, A., Ploegh, H., Martin, K., 2016. Molecular Cell Biology. 8th Edition. W.H.Freeman.
7. Old R. W. and Primrose, S.B.,1994. An Introduction to Genetic Engineering, Blackwell Scientific Publications.
8. Watson, J.D., Gann,A., Levine, M., Losicks,R., 2013. Molecular Biology of the Gene. The Benjumen Cummings Publishing Company, California
9. Wilson, J. and Hunt, T., 2015. Molecular Biology of the Cell. 6th Edition Garland Sciences, Taylor and Francis.