**RECOMBINANT DNA TECHNOLOGY CREDIT HOURS 2+1**

**LEARNING OUTCOME:**

**Students will able to:**

1. Understand basic principles of recombinant DNA technology.
2. Explore applications of recombinant DNA technology in medical and industrial settings.

**COURSE CONTENTS:**

Introduction and scope; Restriction and modification system, Properties of restriction endonucleases, their occurrence and recognition sequences, Assay procedures for restriction endonucleases and slab gel electrophoresis; In vitro genetic engineering; cloning vehicles: plasmids, cosmids and phagemids, YAC and BAC etc; Cloning strategies: Labeling methods of probes, Construction of genomic libraries; Methods for screening the clones; PCR and its application in cloning; prokaryotes and Eukaryotes Expression systems; DNA sequencing; Genetic Transformation system; Gene Knock down, Knock out and knock in.

**PRACTICALS:**

1. Methods of nucleic acid isolation (DNA & RNA).
2. Slab gel electrophoresis.
3. Restriction enzyme digestion of DNA.
4. Transformation systems
5. Electro blotting.

**RECOMMEMDED BOOKS:**

1. Brown, T. A., 2016. Gene Cloning and DNA Analysis: An Introduction; 7th Edition, John Wiley and Sons Ltd., Chicester, UK.
2. Glick, B. R., Pasternak, J. J. and Cheryl L. Patten, C. L. 2009. Molecular Biotechnology: Principles and Applications of Recombinant DNA; 4th Edition, ASM Press, Washington, USA.
3. Green, M. R. and [Sambrook](http://www.amazon.com/exec/obidos/search-handle-url/index=books&field-author=Sambrook%2C%20Joseph/002-0005045-4235257), J. 2012. Molecular Cloning: A Laboratory Manual; 4th Edition, Cold Spring Harbor Laboratory Press, New York, USA.
4. Howe, H. 2007. Gene Cloning and Manipulation, Cambridge University Press, New York, USA.
5. Jeremy W. Dale, J. W., Malcolm von Schantz, M. V. and Plant, N. 2011. From Genes to Genomes: Concepts and Applications of DNA Technology; 3rd Edition, John Wiley and Sons Ltd., Chicester, UK.
6. Nicholl, D. S. T. 2008. An Introduction to Genetic Engineering; 3rd Edition. Cambridge University Press, Singapore.
7. Old, R. W. and Primrose, S. B. 2009. Principles of Gene Manipulation, an Introduction to Genetic Engineering, 5thEdition, Blackwell Scientific Publications, USA.
8. Primrose, S. B. and Twyman, R. M. 2015. Principles of Gene Manipulation and Genomics; 8th Edition, Wiley-Blackwell, Oxford, UK.
9. Watson, J. D., Meyers, R. M., Caudy, A. A. and Witkowski, J. A. 2007. Recombinant DNA: Genes and Genomes - A Short Course; 3rd Edition, Cold Spring Harbor Laboratory Press, New York, USA.

Watson, R. R., & Preedy, V. R. 2016. Genetically modified organisms in food: Production, safety, regulation and public health. Amsterdam: Elsevier Science.