Introduction to Bioinformatics

1. **Course Code** : BLM3810
2. **Course Name** : Introduction Bioinformatics
3. **Instructor** : Nizamettin AYDIN
4. **Credit** : 3
5. **Nature of the course** : Lecture
6. **Assesments** : Homeworks : 20%
   Midterm 1 : 25%
   Midterm 2 : 25%
   Final : 30%

7. **Course Outline** :

   Introduction
   > Definition of Bioinformatics, Importance of Bioinformatics

   Overview of Molecular Biology
   > Cells, Chromosomes, DNA, RNA, Amino Acids, Proteins
   > Genome, Transcriptome, Proteome

   Setting the Technological Scene
   > Perl as a Software Tool, Installing, Debugging, Programming

   Pairwise Sequence Alignment
   > Relation of Sequences
   > Alignment methods (Visual, Brute Force, Dynamic Programming, Word-Based)
   > Dot plots, Global Alignment, Local Alignment
   > Scoring Matrices, Significance of Alignments

   Advance Perl programming
   > Perl one liners, Database systems, Web Technologies

   Multiple Sequence Alignment
   > Global Multiple Alignment, progressive global alignment, Iterative methods,
   > Alignments based on locally conserved patterns
   > Local Multiple Alignment, Profile Analysis, Block Analysis,
   > Pattern-searching or statistical methods
   > Sequence File Formats

8. **Recommended Texts** :

   Introduction to Bioinformatics. Arthur M. Lesk

   Bioinformatics, Biocomputing and Perl. Michael Moorhouse, Paul Barry

   Fundamental Concepts of Bioinformatics. Dan E. Krane, Michael L. Raymer

   Beginning Perl for Bioinformatics. James Tisdall

   Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins. Andreas D. Baxevanis

   Bioinformatics: Sequence and Genome Analysis. David W. Mount

   Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids. Richard Durbin G. Mitchison S. Eddy A. Krogh

   Statistical Methods in Bioinformatics: An Introduction. W. Ewens, G. Grant.

9. **Course Materials** : http://www.yildiz.edu.tr/~naydin