

**SARDAR PATEL UNIVERSITY**  
**Programme: MSC (Integrated Biotechnology)**  
**Semester: II**  
**Syllabus with effect from: December 2010**

<b>Paper Code:</b> PS02CIGB03	<b>Total Credits: 3</b>
<b>Title Of Paper:</b> Computer Applications	

Unit	Description in detail	Weightage (%)
<b>1</b>	<p><b>Introduction to DBMS:</b>            Basic concepts, Organization of database, Components of DBMS, Applications of DBMS            Advantages and disadvantages of database, Introduction to data models (ERM, NDM, HDM, RDM), ER model, Normalization – First, second and third normal forms, Database security.</p>	
<b>2</b>	<p><b>Introduction to SQL:</b>            Fundamentals of RDBMS, CODD's principles, Introduction to SQL syntax, Creation, pupation and access of relation tables using SQL, Commands: Create, insert, update, delete, select, alter, and drop Data constraints : Column level, table level, null value, primary key, unique key and foreign key            Check integrity constraints, Range searching and Pattern matching,  <b>ORACLE functions:</b> AVG, MIN, COUNT, MAX, SUM, ABS, POWER, ROUND, SQRT, LOWER, INITCAP, UPPER, SUBSTR, RPAD, LENGTH, LPAD, LTRIM, RTRIM, LENGTH, TO_DATE, TO_CHAR.</p>	
<b>3</b>	<p><b>Structured Query Language and PL/SQL:</b>            Group of data, data manipulation, joining multiple table, joining a table to itself, Sub queries: Union, interest, minus clause, Indexes: Create, dropping, Views: Create, update, destroying, Sequences: Create, altering, and dropping, Granting and revoking permissions, Introduction to PL/SQL, Iterative control: While, For, GOTO, ORACLE transactions, LOCKS, Cursors: Opening, closing, %NOTFOUND, %FOUND, %ISOPEN, %ROWCOUNT, STORED procedures, STORED functions, Database triggers: Creating, deleting</p>	
<b>4</b>	<p><b>Introduction to Bioinformatics:</b>            Data warehousing, Data mining, Data bank technique, Use of nucleic acid and protein data banks, NCBI, EMBL, DDBJ, Swissport, Multiple sequence alignment, Gene prediction, Genome analysis and phylogenetic prediction            Introduction to proteomics, genomics, Mechanism of flow of information, central dogma of molecular biology., A primer in molecular biology, Biological sequence database (Nucleic acid sequence database, genomic database, protein sequence database, organism specific database, miscellaneous database), structural database (SCOP and CATH)            Sequence analysis – evolution way basis – concept of homology, analogy orthologues, paralogues examples. Dot-Plots dynamic programming concept of similarity and distance.            Global sequence alignment – Needleman Wansch algorithm, local seq. alignment – SW algorithm, BLAST, FASTA and variations.</p>	
	<b>Practical:</b>	
	<ul style="list-style-type: none"> <li>• Viewing Protein Structures on SCOP/CATH</li> <li>• Creation &amp; Description of tables</li> <li>• Inserting records</li> </ul>	



	<ul style="list-style-type: none"><li>• Use of Constraints</li><li>• Options of Select</li><li>• Use of Alter, Update, Delete &amp; Drop</li><li>• Examples of view, Index &amp; Sequence</li><li>• Solving Internal Papers &amp; Revision</li><li>• PL/SQL Blocks</li><li>• Exercise Queries 1 to 29 (From Ivan Bayross)</li><li>• Exercise Queries 30 onwards</li><li>• Database Triggers</li></ul>	
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**Basic Text & Reference Books:**

- Introduction to Database System by Bipin Desia
- Database Management System by Arun Majumdar
- Introduction to Database System by Korth
- Oracle Developer 2000 by Ivan Bayross
- PL/SQL by Ivan Bayross
- Bigher's guide to Bioinformatics
- Bioinformtics drugs discovery b y Mahindi Ratta
- Bioinformatics – A machine learning approach, MIT Press
- Developing Bioinformatics skills, O'Reilly Associates

