E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

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Chennai Accredited by NAAC with "A" Grade |

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NAGAPATTINAM – 611 002

B.Tech. Information Technology

Full Time Curriculum and Syllabus

First Year – First Semester

Second Year – Third Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1701MA301	Engineering Mathematics - III	3	2	0	4	40	60	100
1702IT301	Data Structures and Algorithms	3	0	2	4	50	50	100
1702IT302	Digital Principles and Design	3	0	2	4	50	50	100
1702IT303	Principles of Communication	3	0	0	3	40	60	100
1702IT304	Computer Organization and Architecture	3	0	0	3	40	60	100
1702CSX02	Database Management Systems	3	0	0	3	40	60	100
Laboratory Course								
1702CSX52	Database Management Systems Lab	0	0	2	1	50	50	100
1704GE351	Life Skills: Soft Skills	0	0	2	1	100	-	100
	Total	18	2	8	23	410	390	800

1702IT301	DATA STRUCTURES AND ALGORITHMS	L	T	P	C
		3	0	2	4

PREREQUISITE :
Programming in C and C++

COURSE OBJECTIVES:
1. Learn the fundamental concepts of Data Structures
2. Study the various algorithms and analysis methods
3. Use various data structures and algorithms techniques for real time examples

UNIT I   INTRODUCTION   9 Hours
Data Structures – Programming Strategies – ADT – Algorithms – Problem Solving – Complexity –
Asymptotic Notations – Recurrence Relations

UNIT II   DATA STRUCTURES   9 Hours
Array – List: Types, Applications, Linked List – Stack: Operations, Applications, Implementations – Queue:
Operations, Applications, Implementations – Tree: Types, Implementation, Applications

UNIT III   DIVIDE AND CONQUER & DYNAMIC PROGRAMMING   only true   9 Hours
Divide and Conquer techniques with Algorithm Analysis – Merge Sort – Optimal Binary Search Tree,
Huffman Tree – Strassen's Matrix Multiplications. Dynamic Programming with Algorithm Analysis – Graph –
Warshall's, Floyd' Algorithms – Binomial Coefficient

UNIT IV   GREEDY AND ITERATIVE METHODS   graph method .   9 Hours
Prim's Algorithm – Kruskal's Algorithms – Dijikstra's Algorithms – The stable Marriage Problem –
Algorithm Analysis

UNIT V   ALGORITHM ANALYSIS AND APPLICATIONS   9 Hours
Algorithm Analysis and power – P,NP,NP-Complete Problems – Backtracking – N-Queen Problem, Graph
Coloring – Branch and Bound –Decision Tree - Travelling Salesman Problem – Knapsack Problem

LIST OF EXPERIMENTS:

MODULE 1:   15 Hours
1. Implement Array ADT
3. Write the program to perform Linked List, Stack and Queue Operations
4. Write the program to implement Tree Traversal operations
5. Write the program to implement sorting operations
6. Write the program to implement searching operations

MODULE 2:
1. Implement Tower of Honoi Problem using recursion
2. Implement Fibonacci number generation using recursion
3. Implement minimum spanning tree using Prim's, Kruskal's Algorithms
4. Write program to implement all the functions of a dictionary (ADT) using hashing.
5. Given the sequence of integers 5 9 1 7 4 3 2 0 manually arrange this sequence in ascending order using the
   three "'elementary'" sorting methods: insertion sort, bubble sort and selection sort, showing at each step
   the new configuration of the sequence. How many comparisons and how many element moves were used
   by each method? Which is the best performing method for sorting this array of integers? Which would be
   the worst arrangement of this sequence?

Hardware: Standalone desktops 30 Nos
Software: Turbo C++ compiler or equivalent

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :   **TOTAL: 60 HOURS**
1. Decision Tree Approach
2. Networking problems

COURSE OUTCOMES:
On the successful completion of the course, students will be able to

CO1	Understand the concepts of Data structures and Algorithms
CO2	Explain various data structures
CO3	Apply Divide and Conquer & Dynamic programming method to solve different problems
CO4	Apply Greedy and Iterative method to solve different problems
CO5	Analysis various algorithms using various types and methods

REFERENCES:
1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education, 2014

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B.Tech. Information

Technology

Full Time Curriculum and Syllabus

Second Year – Fourth Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1701MA401	Probability and Queuing Theory	3	2	0	4	40	60	100
1702IT401	Software Engineering and Project Management	3	0	0	3	40	60	100
1702IT402	Java Programming	2	0	4	4	50	50	100
1702IT403	Internet of Things	2	4	0	4	40	60	100
1702IT404	Operating Systems	3	0	2	4	50	50	100
1702IT405	Computer Networks	3	0	0	3	40	60	100
1701CH201	Environmental Studies #	3	0	0	3	40	60	100
Laboratory Course								
1702IT451	Networks Lab	0	0	2	1	50	50	100
1704GE451	Life Skills: Verbal Ability	0	0	2	1	100	-	100
	Total	19	6	10	27	450	450	900

As per EGSPECR2017 regulation 1701CH201 – Environmental studies course will be offered for lateral entry students

Regular Students Total Credit: 24 and Lateral Entry Students Total Credit: 27

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PROBABILITY AND QUEUEING THEORY
(Common to B.E / B.Tech – CSE, IT)

170IMA401

L	T	P	C
3	2	0	4

PREREQUISITE:
Engineering Mathematics I
Engineering Mathematics II
Engineering Mathematics III

COURSE OBJECTIVES:
1. To establish the necessary background in basic probability tools and concepts.
2. To provide students with the ability to understand and conduct computer systems modeling and performance analysis.
3. To emphasis on more advance topics that are particularly useful in modeling, such as Markov models and queuing theory.

UNIT I   PROBABILITY AND RANDOM VARIABLES   12 Hours
Probability- Conditional probability-Baye's theorem-Discrete and continuous random variables –Expectation- Variance- Moments – Moment generating functions –Real Time Problems

UNIT II   THEORETICAL DISTRIBUTIONS   12 Hours
Discrete Distributions: Binomial, Poisson, Geometric - Continuous Distributions: Uniform, Exponential, Normal, Gamma distributions - Application of Distribution in Engineering Problems

Unit III   TWO - DIMENSIONAL RANDOM VARIABLES   12 Hours
Joint distributions – Marginal and conditional distributions – Covariance – Correlation and Linear regression

UNIT IV   RANDOM PROCESSES   12 Hours
Classification – Stationary process – Markov process - Poisson process – Discrete parameter - Markov chain – Chapman Kolmogorov equations – Limiting distributions.

UNIT V   QUEUEING MODELS   12 Hours
Birth and Death processes – Single and multiple server queueing models – Little's formula - Queues with finite waiting rooms- Computer Science Applications - Finite source models - M/G/1 queue – Pollaczek-Khinchine formula - M/D/1 and M/EK/1 as special case

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :   **TOTAL: 60 HOURS**
1. Transformation of random variables.
2. Series queues, Jackson networks.

COURSE OUTCOMES:
After completion of the course, Students will be able to
CO1:   Determine the parameters of unpredictable experiments using probability concepts.
CO2:   Construct probabilistic models for observed phenomena through discrete and continuous distributions.
CO3:   Associate the random variables, by designing joint distribution and correlate the random variables.
CO4:   Make use of discrete time Markov chains in probabilistic manner, to model computer systems.
CO5:   Solve the queuing approaches problems using basic characteristics of queuing theory.
CO6:   Utilize the queuing models to minimize the time of service in a queuing system.

REFERENCES:

1. Ibe.O.C., "Fundamental of Applied Probability and random Processes", Elsevier, Ist Indian Reprint, 2007
2. Gross.D and Harris C.M, "Fundamentals of Queuing Theory", Wiley Student Edition, 2004.
3. Robertazzi, "Computer Networks and Systems: Queuing Theory and performance Evaluation", Springer, 3rd Edition, 2006
4. TahaH.A."Operations Research", Pearson education, Asia, 8th Edition, 2007
5. Trivedhi K.S, "Probability and statistics with Reliability, queuing and Computer Science Applications", John Wiley and Sons, 2nd Edition, 2002
6. nptel.ac.in/courses/111105035, www.nptelvideos.in/2012/11/Mathematics.html
7. www.learnerstv.com/Free-maths-video lectures - ltv348-page1.html

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NAGAPATTINAM – 611 002

B.Tech. Information Technology

Full Time Curriculum and Syllabus

Third Year – Fifth Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1702IT501	Object Oriented Analysis and Design	3	0	0	3	40	60	100
1702IT502	Distributed Computing	3	0	0	3	40	60	100
1702IT503	Computer Graphics and Multimedia	3	0	2	4	50	50	100
1702IT504	Web Programming	3	0	2	4	50	50	100
	Professional Elective - 1	3	0	0	3	40	60	100
	Professional Elective - 2	3	0	0	3	40	60	100
Laboratory Course								
1704IT551	Case Tools (Mini Project - I)	0	0	2	1	50	50	100
1704GE551	Life Skills: Aptitude - I	0	0	2	1	100	-	100
1704IT552	Technical Seminar	0	0	2	1	100	-	100
	Total	18	0	10	23	510	390	900

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COMPUTER GRAPHICS AND MULTIMEDIA	L	T	P	C
	3	0	2	4

170217503

PREREQUISITE:
Engineering Graphics, Computer Programming

COURSE OBJECTIVES:
1. Provide in-depth knowledge of display systems, image synthesis and shapes.
2. Understand basic concepts related to Multimedia including data standards, algorithms and software.
3. Develop multimedia applications by utilizing existing libraries.

UNIT I   GRAPHICS FUNDAMENTALS   9 Hours
Introduction-Line Circle and Ellipse Drawing Algorithm-Attribute-Two dimensional geometric transformation-Two dimensional Clipping and Viewing

UNIT II   TWO DIMENSIONAL GRAPHICS   9 Hours
Two dimensional geometric transformations - Matrix representations and homogeneous co ordinates, composite transformations: window to-viewport coordinate transformation, Two dimensional viewing functions: clipping operations-Point Clipping - Line Clipping: Cohen Sutherland, Liang Barsky -Polygon Clipping: Sutherland Hodgeman

UNIT III   THREE DIMENSIONAL GRAPHICS   9 Hours
3D concepts and object representation:3D display methods, polygon surfaces, tables, equations, meshes, curved lies and surfaces, quadric surfaces, spline representation, cubic spline interpolation methods, Bezier curves and surfaces, B-spline curves and surfaces.
3D transformation and viewing:3D scaling, rotation and translation, composite transformation, viewing pipeline and coordinates, parallel and perspective transformation, view volume and general (parallel and perspective) projection transformations.

UNIT IV   ANIMATION   9 Hours
Text: Using Text in Multimedia, computer and text, Font Editing and design tools, hypermedia and hypertext - Image: Making Still Images, color, Image File format, Principles of Animation, animation by computer, making animation - Video: Digital video containers, shooting and editing video.

UNIT V   MULTIMEDIA   9 Hours
Basic software tools - Text, image, and sound editing tools - painting and drawing tools, animation tools - making instant multimedia - Office suite - Multimedia authoring tools: Types and page based authoring tools, icon and time based authoring tools.

List of Experiments: 15 Hours
1. Implementation of Line, Circle, Ellipse drawing Using DDA Algorithm and Bresenham Algorithm
2. Implementation of 2D Transformations
3. Implementation of 3D Transformations
4. Implementation of Line Clipping Algorithm
5. Use of various Photo editing tool to solve real time problems and apply various effects
6. Use of various Animation tools to solve real time problems and apply various effects
7. To perform a morphing effect of crying face to sad face to happy face and last to most happiest face.
8. Use of Open GL tool to perform Animation and Virtual Reality effects.

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :
1. Computer Vision.
2. Visualization Techniques.

Course Outcomes:
At the end of this course, students will be able to,
CO1: Apply 2D graphics and algorithms to real world applications
CO2: Create interactive graphics applications using 3D modeling and transformation techniques
CO3: Understand the processes involved in the development of a multimedia product from client brief through to delivery
CO4: Plan and create a multimedia product that includes animation, audio and video

REFERENCES:
1. J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes, Computer Graphics; Principles and practice; Second Edition in C;; Addison Wesley, 2016

2. Computer Graphics - C version; D. Hearn and M. P. Baker; Pearson Education, 2014.
3. Computer Graphics - OpenGL version; D. Hearn and M. P. Baker; Pearson Education, 2015
4. K. Andleigh, KiranThakrar , Multimedia Systems Design, PHI, 2012
5. Ze Nian Li, S. Drew, "Fundamentals of Multimedia", PHI, 2012.
6. Donald Hearn and M Pauline Baker, Computer Graphics, Pearson Education, 2nd Edition, 2013.
7. http://nptel.ac.in/

WEB PROGRAMMING

17021T504

L	T	P	C
3	0	2	4

PREREQUISITE:
1. Programming in Java Programming.
2. Database Management Systems

COURSE OBJECTIVES:
1. To understand the concept of client / server programming
2. To apply web programming languages for developing web applications
3. To know the unique features of scripting languages

UNIT I WEB ESSENTIALS   9 Hours
Internet – Web clients – Web servers – Markup languages – Introduction to XHTML-Editing XHTML-Headings-Linking –Tables-Images-Forms-Internal linking –Frames - Lists- Cascading Style Sheets (CSS): Features-Style rule cascading and inheritance - Text properties –CSS box model.

UNIT II CLIENT SIDE PROGRAMMING   9 Hours
Client side vs. Server side programming languages - Introduction to java script –Control statements I - Control statements II - Functions- Objects – Arrays – PHP Programming

UNIT III SERVER SIDE PROGRAMMING   9 Hours
Java servlet: Architecture – Servlet life cycle -Simple programs using java servlet– Parameter data – Sessions – Cookies – Other servlet capabilities –Data storage –Servlet and concurrency- JDBC- Connecting a java servlet program to a database

UNIT IV XML AND WEB SERVICES   9 Hours
XML Namespaces-DTD and XML schema-XML parsers: DOM vs. SAX-XSLT – Xquery - XPath- JSP - Running JSP applications – Java beans classes and JSP - Web services concepts - Web services for clients – WSDL – Representing data types: XML schema – SOAP - J2EE

LIST OF EXPERIMENTS   24 HOURS
1. Write a html program for Creation of web site with forms, frames, links, tables etc
2. Design a web site using HTML and DHTML. Use Basic text Formatting, Images,
3. Create a script that asks the user for a name, then greets the user with "Hello" and the user name on the page
4. Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.
5. Create a script that prompts the user for a number and then counts from 1 to that number displaying only the odd numbers.
6. Create a script that will check the field in Assignment 1 for data and alert the user if it is blank. This script should run from a button.
7. Using CSS for creating web sites
8. Creating simple application to access data base using JDBC Formatting HTML with CSS.
9. Program for manipulating Databases and SQL.
10. Program using PHP database functions.
11. Write a web application that functions as a simple hand calculator, but also keeps a "paper trail" of all your previous work
12. Install Tomcat and use JSP and link it with any of the assignments above
13. Reading and Writing the files using .Net
14. Write a program to implement web service for calculator application
15. Implement RMI concept for building any remote method of your choice.

                                                                               TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :
1. Software Development

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B.Tech. Information Technology

Full Time Curriculum and Syllabus

Third Year – Sixth Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1702IT601	C# and .NET	2	0	4	4	50	50	100
1702IT602	Mobile Computing	3	0	0	3	40	60	100
1702IT603	Data Warehousing and Data Mining	3	0	2	4	50	50	100
1702IT604	Wireless Communication	3	0	0	3	40	60	100
	Professional Elective - 3	3	0	0	3	40	60	100
	Open Elective - 1	3	0	0	3	40	60	100
Laboratory Course								
1704IT651	Mobile Application Development (Mini Project - II)	0	0	2	1	50	50	100
1704GE651	Life Skills: Aptitude - II	0	0	2	1	100	-	100
1704IT652	Industrial Visit Presentation	0	0	0	1	100	-	100
	Total	17	0	10	23	510	390	900

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DATA WAREHOUSING AND DATA MINING

L	T	P	C
3	0	2	4

PREREQUISITE:
Database Management Systems

COURSE OBJECTIVES:
1. Learn about the safe storage of data and architecture of data warehouse
2. Learn about the Elimination of errors from the data
3. Understand the Deleting data that is no longer important to the organization
4. Study the extraction of implicit, previously unknown, and potentially useful information from data
5. To help in the generation of reports for the management.

UNIT I   INTRODUCTION TO DATA WAREHOUSING   9 Hours
Introduction- Data warehouse Architecture- Online Analytical Processing (OLAP) Multidimensional data model- Data warehouse schema –OLAP Guidelines – Data Extraction, Clean up, and Transformation Tools – Metadata.

UNIT II   DATA MINING PRIMITIVES AND CONCEPT DESCRIPTION   9 Hours
Introduction to Data mining – Types of Data – Data Mining Functionalities – Interestingness of Patterns- Classification of Data Mining Systems – Data Mining Task Primitives-Pre-processing- Mining Frequent Patterns, Associations and Correlations – Mining Methods –Correlation Analysis – Constraint Based Association Mining.

UNIT III   CLASSIFICATION AND PREDICTION   9 Hours
Introduction – Decision Tree Induction – Bayesian Classification – Back propagation –Support Vector Machines- Lazy Learners – Other classification methods – Prediction.

UNIT IV   CLUSTERING AND ASSOCIATION   9 Hours
Cluster Analysis -Categorization of Major Clustering Methods – K-means– Partitioning Methods – Hierarchical Methods – Outlier Analysis -Density-Based Methods - Grid Based Methods – Model-Based Clustering Methods- Data Mining Applications.

UNIT V   ADVANCED TOPICS   9 Hours
Web Mining – Web Content Mining – Structure and Usage Mining – Spatial Mining – Time Series and Sequence Mining – Graph Mining.

LIST OF EXPERIMENTS: 15 Hours
1. Exercise on Data warehouse design for an enterprise
   a. Loading the dataset.
   b. Data pre-processing.
2. Exercise on Discovering Association Rules
   c. A-priori algorithm.
   d. FP growth algorithm.
3. Exercise on Classification Algorithms
   e. Bayesian classification.
   f. Decision tree.
   g. Support vector machine
4. Exercise on Clustering Algorithms
   h. K-means clustering.
   i. One Hierarchical clustering.
5. Exercises on Data mining tools
   j. Applications of classification for web mining.
   k. Case Study on Text Mining or any commercial application.

SOFTWARE: WEKA, Rapid Miner, DB Miner, Python or Equivalent.

FURTHER READING: **TOTAL: 60 HOURS**
Data Science &Data Classifications

COURSE OUTCOMES:
At the end of this course, students will able to,
CO1: Explain the concepts of Data Warehousing architecture and implementation.
CO2: Apply the association rules for mining applications.
CO3: Discuss on appropriate Classification/ Clustering techniques for various problems with high dimensional data.
CO4: Apply data mining techniques and methods to large data sets.
CO5: Use various data mining tools to solve different data sets

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B.TECH INFORMATION TECHNOLOGY

Fourth Year – Seventh Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1701MGX01	Professional Ethics	3	0	0	3	40	60	100
1702IT701	Data Analytics	3	2	0	4	40	60	100
1702IT702	Security in Computing	3	0	2	4	50	50	100
1702IT703	Cloud Infrastructure and Computing	3	0	2	4	50	50	100
1705IT015	Information Management (Elective 5)	3	0	0	3	40	60	100
1703ED001 / 1703ME027 / 1703CE035	Open Elective (Elective 6): Start Up Entrepreneurship / Universal Human Values and Ethics / Industrial Pollution, Prevention and Control	3	0	0	3	40	60	100
Laboratory Course								
1704IT751	Software Development (Mini Project III)	0	0	2	1	50	50	100
1704GE751	Life Skills: Competitive Exam Preparation	2	0	0	2	100	-	100
1704IT752	In Plant / Internship Training Presentation	0	0	0	1	100	0	100
	Total	20	2	6	25	510	390	900

L – Lecture | T – Tutorial | P – Practical | CA – Continuous Assessment | ES – End Semester

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B.Tech. Information Technology

Full Time Curriculum and Syllabus

Fourth Year – Eighth Semester

Course Code	Course Name	L	T	P	C	CA	ES	Total
Theory Course								
	Professional Elective – 5	3	0	0	3	40	60	100
	Professional Elective – 6	3	0	0	3	40	60	100
	Professional Elective – 7	3	0	0	3	40	60	100
Laboratory Course								
1704IT851	Project Work	0	0	18	9	50	50	100
	Total	9	0	18	18	170	230	400

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OBJECTIVES:

- Understand basic visualization and interaction techniques in the information visualization fields
- Understand basic approaches to visually exploring large databases
- Explore different abstraction mechanisms
- Create interactive visual interfaces

DATA VISUALIZATION	**9 Hours**
Overview of Data Visualization – Visualization Stages – Perception Gibson - Affordance Theory – A Model of Visual Processing – Types of Data	
UNIT II **COMPUTER VISUALIZATION**	**9 Hours**
Computer Visualization – Computer Visualization; Exploring Complex Information Spaces – Fisheye Views – Applications – Comprehensible Fisheye Views – Fisheye Views for 3D data – Non Linear Magnification – Comparing Visualization of Information Spaces – Abstraction in Computer Graphics – Abstraction in User Interfaces	
UNIT III **MULTIDIMENSIONAL COMPUTER VISUALIZATION**	**9 Hours**
Multiple Dimensions models – Trees – Web Works – Data Mapping: Document Visualization – Workspaces.	
UNIT IV **TEXTUAL METHODS OF ABSTRACTION**	**9 Hours**
From Graphics to Pure Text – Figure Captions in Visual Interfaces – Interactive 3DIllustrations with Images and Text – Consistency of rendered Images and their Textual labels – Architecture – Zoom Techniques– Interactive Handling of Images and Text	
UNIT V **CASE STUDY**	**9 Hours**
Virtual reality - Augmented reality - Tableau – Fusion Charts – High charts – Plotly - Sisense	
TOTAL:	**45 Hours**

COURSE OUTCOMES:

At the end of this course, students will be able to,

CO1: Understand various visualization techniques

CO2: Explain the process of computer visualization techniques

CO3: Understand various multidimensional computer models

CO4: Apply various textual methods to solve interactive and rendering applications

CO5: Illustrate various abstraction and interaction system process

REFERENCES:

1. Thomas Strothotte, —Computer Visualization-Graphics Abstraction and Interactivity‖, Springer, 2015.
2. Colin Ware —Information Visualization Perception for Design‖, Second edition, Morgan Kaufman 2013.
3. Stuart.K. Card, Jock.D. Mackinlay and Ben Shneiderman, —Readings in Information Visualization Using Vision to Think‖, Morgan Kaufmann Publishers, 2012
4. http://nptel.ac.in

1703IT030	BIO INFORMATICS	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. To understand the need for Bioinformatics technologies.
2. To familiarize with the modeling techniques.
3. To learn microarray analysis.
5. To understand Pattern Matching and Visualization techniques

UNIT I **INTRODUCTION**	**9 Hours**
Need for Bioinformatics technologies Basics of Bioinformatics technologies– Structural bioinformatics – Data format and processing – Secondary resources and applications – Role of Structural bioinformatics – Biological Data Integration System.	
UNIT II **DATA WAREHOUSING AND DATAMINING IN BIOINFORMATICS**	**9 Hours**
Bioinformatics data – Data warehousing architecture – data quality – Biomedical data analysis – DNA data analysis – Protein data analysis – Machine learning – Neural network architecture and applications in bioinformatics.	
UNIT III **MODELLING FOR BIOINFORMATICS**	**9 Hours**
Hidden markov modeling for biological data analysis – Sequence identification –Sequence classification – multiple	