

E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai
Accredited by NAAC with 'A' Grade | Accredited by NBA
NAGAPATTINAM – 611 002



B.E COMPUTER SCIENCE AND ENGINEERING

Final Year –Eighth Semester

Course Code	Course Name	L	T	P	C	Maximum Marks			
						CA	ES	Total	
Theory Course									
	Elective VII	3	0	0	3	40	60	100	
	Elective VIII	3	0	0	3	40	60	100	
	Elective IX	3	0	0	3	40	60	100	
Laboratory Course									
1704CS851	Project Work	0	0	18	9	50	50	100	

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

1703CS024

BIO INFORMATICS

L	T	P	C
3	0	0	3

PREREQUISITE:

1. Basic Knowledge in network analysis
2. Data mining.

COURSE OBJECTIVES:

- To let the students know the recent evolution in biological science
- To let the students know the Genome Databases
- To let the students know the Sequence alignments

UNIT I GENOMICS

9 Hours

Genes, Genomes, Human Genome Project, Rough and Final Draft of Human Genome Project, Goals of Human Genome Project, Vectors: plasmids, Cosmids, bacteriophage, M13 vectors, BAC, YAC and synthetic plasmids. Enzymes: DNA polymerase, restriction endonucleases, topoisomerase I and DNA ligase, reverse transcriptase, kinase, alkaline phosphatase, nuclease, RNase. Application of gene technology, Gene Silencing, Geneknock out and gene therapy

UNIT II GENOME DATABASES AND GENE EXPRESSION AND DNA MICROARRAY

9 Hours

Nucleic acid sequences. Sequence databases: GeneBank, European Molecular Biology Laboratory (EMBL) Nucleotide sequence databank, Introduction, Basic steps for gene expression, genome information and special features, coding sequences (CDS), untranslated regions (UTR's), cDNA library, expressed sequence tags (EST). Tools for microarray analysis; soft-finder, xCluster, MADAM, SAGE, Applications of microarray technology.

UNIT III PROTEOMICS

9 Hours

Proteins and Enzymes; Proteomics classification; tools and techniques in proteomics; gel electrophoresis, gel filtration, PAGE, isoelectric focusing, affinity chromatography, HPLC, ICAT, fixing and spot visualization, Mass spectroscopy for protein analysis, MALDI-TOF, Electro spray ionization (ESI), Tandem mass spectroscopy (MS/MS) analysis; tryptic digestion and peptide fingerprinting (PMF).

UNIT IV SEQUENCE ALIGNMENTS

9 Hours

Introduction, Protein sequences, physicochemical properties based on sequence, sequence comparison. Pair-wise sequence alignment, gaps, gap-penalties, scoring matrices, Smith-Waterman and Needleman-Wunsch algorithms for sequence alignments, multiple sequence alignment, comparison, composition and properties, useful programs, ClustalW, BioEDIT, BLASTp, Phylogenetic analysis tools- Phylip, ClustalW, Online phylogenetic analysis.

UNIT V IMMUNOINFORMATICS

9 Hours

Complement fixation, structure and classes of antibodies, genetic basis of antibody diversity. Understanding MHC I and II: structure and antigen presentation, T and B lymphocytes activation and role in humoral and cell mediated immunity. Vaccines live and attenuated, killed, multi-subunit and DNA vaccines. Hypersensitivity and auto immune diseases. ELISA, RIA, Hybridoma Technology.

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR:

- Introduction about Genetic Algorithms
- Computing tools for Bio informatics

REFERENCES:

1. Biotechnology: Current Progress Volume 1 by P. N. Cheremisinoff and L. M. Ferrante. Technomic Publishing Co. Inc
2. Bergey's Manual of Systematic Bacteriology (2nd Ed.), Volumes 1 to 4 Springer
3. The Search for Bioactive Compounds from Microorganisms by S. Omura
4. DNA Cloning : A practical approach D.M. Glover and D.B. Hames, RL Press, Oxford, 1995
5. Genetic Engineering : An Introduction to Gene Analysis and Exploitation in Eukaryotes, S. M. Kingsman, Blackwell Scientific Publications, Oxford, 1998
6. <https://nptel.ac.in/courses/102/106/102106065/>

1703CS027	DATA CENTRE AND VIRTUALIZATION	L	T	P	C
		3	0	0	3

PREREQUISITE:

1. Computer Networks
2. Computer Organization and Architecture

COURSE OBJECTIVES:

- Understand the Phases of Journey to the Cloud.
- Describe the Key Elements of Classic Data Center
- Understand the Concepts of Virtualized Data Center

UNIT I JOURNEY TO THE CLOUD 8 Hours

Business Drivers for Cloud Computing, Definition of Cloud Computing, Characteristics of Cloud Computing as per NIST, Steps Involved in Transitioning from Classic Data Center to Cloud Computing Environment

UNIT II CLASSIC DATA CENTER (CDC) 9 Hours

Overview of Classic Data Center, Compute, Storage and Networking, Object Based and Unified Storage Technologies, Business Continuity Overview, Backup, Replication Technologies and CDC Management.

UNIT III VIRTUALIZED DATA CENTER (VDC) 11 Hours

Compute virtualization, Storage Virtualization, Network Virtualization Techniques, Methods for Implementing Desktop Virtualization, their Benefits, and Considerations, Application Virtualization Methods, Benefits, and Considerations..

UNIT IV BUSINESS CONTINUITY IN VIRTUALIZED DATA CENTER 8 Hours

Overview of Business Continuity in Virtualized Data Center, Fault Tolerance Mechanism in Virtualized Data Center, Backup and Recovery of Virtual Machines (VMs), VM Replication and Migration Technologies

UNIT V CLOUD INFRASTRUCTURE AND MANAGEMENT 9 Hours

Cloud Computing Primer, Overview of Cloud Computing, Cloud Services and Deployment Models, Economics of Cloud, Cloud Infrastructure Framework, Infrastructure Management and Service Creation Tools, Cloud Service Management, Cloud Migration Considerations

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR:

1. Cloud evolution-VMware Virtualization Tools- Google Infrastructure- Google Cloud Security

REFERENCES:

1. Cloud Infrastructure and Services EMC2 Bangalore Book
2. Anthony T Velte, Cloud Computing: A practical Approach, Tata McGraw Hill, 2011
3. Halper Fern, Kaufman Marcia, Bloor Robin, Hurwit Judith, Cloud Computing for Dummies, Wiley India, 2013
4. <http://nptel.ac.in/courses/106105167/>

1703CS035	SOCIAL NETWORK ANALYSIS	L	T	P	C
		3	0	0	3

PREREQUISITE:

Basics of Internet Programming

COURSE OBJECTIVES:

- To give the introduction about semantic web and ontology
- To apply the concept community structure and human behaviors in social networks
- To implement visualization of social networks.

UNIT I INTRODUCTION

9 Hours

Graph theory basics-Semantic web-development of social network analysis-key concepts and measures in network analysis -global structure-macro structure-personal networks-blogs and communities-web based networks

UNIT II KNOWLEDGE REPRESENTATION

9 Hours

Ontologies in semantic web-resource description framework-graph visualizations-notations-SPARQL-web ontology language-UML comparison-ER comparison-xml comparison-web based knowledge representation

UNIT III MODELING AND AGGREGATING

9 Hours

State of the art in network-ontological representation-conceptual model-representing identity-determining equality-evaluating smashing-advanced representations-extracting evolution of web community from a series of web archive – detecting communities in social networks – definition of community – evaluating communities – methods for community detection and mining – applications of community mining algorithms – tools for detecting communities social network infrastructures and communities – decentralized online social networks – multi – relational characterization of dynamic social network communities.

UNIT IV SPECULATION OF HUMAN BEHAVIOR

9 Hours

Understanding and predicting human behavior for social communities – user data management – inference and distribution – enabling new human experiences – reality mining – context – awareness – privacy in online social networks – trust in online environment – trust models based on subjective logic – trust network analysis – trust transitivity analysis – combining trust and reputation – trust derivation based on trust comparisons – attack spectrum and countermeasures.

UNIT V APPLICATIONS

9 Hours

Graph theory – centrality – clustering – node-edge diagrams – matrix representation – visualizing online social networks, visualizing social networks with matrix-based representations – matrix and node-link diagrams – hybrid representations – applications – cover networks – community welfare –collaboration networks – co-citation networks.

TOTAL: 45 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR:

Five Axis CNC machines - User defined cycles - Rapid Manufacturing.

REFERENCES:

1. Analyzing Social Networks by Stephen P. Borgatti SAGE Publications Ltd.; 1 edition ,2013
2. Borko Furht, “Handbook of Social Network Technologies and Applications”, 1st Edition, Springer, 2010.
3. Guandong Xu ,Yanchun Zhang and Lin Li, “Web Mining and Social Networking – Techniques and a
4. Peter Mika, “Social Networks and the Semantic Web”, First Edition, Springer 2007.plications”, First Edition Springer, 2011.
5. <https://nptel.ac.in/courses/106/106/106106169/>