

**COURSE STRUCTURE & SYLLABUS OF
BACHELOR OF TECHNOLOGY (B.TECH)**

In

COMPUTER

Course Structure

Fourth Year

Seventh Semester

ELECTIVE – I

Paper Code	Name of the Subject
BECO5-I	Neural Network & Application
BECO5-II	Parallel Processing
BECO5-III	Mobile Computing
BECO5-IV	Fuzzy Set Theory & Application

BECO5-I: NEURAL NETWORK & APPLICATION

1. BIOLOGICAL NEURAL NETWORKS:

Neuron Physiology: Factors Affecting Potassium- Ion Flow, Neuronal Diversity, Specification of the Brain; The Eye's Neural Network: Retina Structure , Image Processing in the Retina.

2. ARTIFICIAL NEURAL NETWORKS: CONCEPTS:

Neural Attributes: Artificial Neural Networks, Learning in Artificial Neural Networks: The Delta Rule , Artificial Neural Network Topologies, Algorithms; ANN Adaptability.

3. FUZZY LOGIC:

Propositional Logic , Fuzzy Logic , Time- Dependent Fuzzy Logic: Crisp Logics , Temporal Fuzzy Logic (TFL) , Applying Temporal Fuzzy Operators, Defuzzification of Temporal Fuzzy Logic, Example: Applicability of TFL in Communication Systems.

4. FUZZY NEURAL NETWORKS:

Fuzzy Artificial Neural Network (FANN) , Fuzzy Neural Example, Neuro – Fuzzy Control: Traditional Control; Neural Control;; Fuzzy Control; Fuzzy- Neural Control

5. APPLICATIONS:

Signal Processing; Image Data Processing: Handwritten Character Recognition; Visual Image Recognition , Communications Systems: Call Processing ; Switching Traffic Control ; Packet Radio Network Routing , Intelligent Control , Tools and Companies

BECO5-II: PARALLEL PROCESSING

1. INTRODUCTION:

Why Parallel Processing? Shared Memory Multiprocessing, Distributed Memory

2. PARALLEL PROCESSING ARCHITECTURES:

Parallelism In Sequential Machines, Abstract Model Of Parallel Computer, Multiprocessor Architecture, Pipelining, Array Processors.

3. PROGRAMMABILITY ISSUES:

An Overview, Software Tools.

4. DATA DEPENDENCY ANALYSIS:

Types Of Dependence, Loop And Array Dependence, Loop Dependence Analysis, Solving Diophantine Equations, Program Transformations

5. THREAD –BASED IMPLEMENTATION:

Thread Management, Example With Threads, Attributes Of Threads, Mutual Exclusion With Threads, Mutex Usage Of Threads, Thread Implementation, Java Threads.

6. DISTRIBUTED COMPUTING –II: REMOTE PROCEDURE CALL:

Parameter Passing, Locating The Server

7. ALGORITHMS FOR PARALLEL MACHINES:

Speedup, Complexity And Cost, Parallel Reduction, Quadrature Problem, Matrix Multiplication, Parallel Sorting Algorithms, Solving Linear Systems, Probabilistic Algorithms.

8. DISTRIBUTED DATA BASES:

Objectives, Distribution Options, Database Integrity, Concurrency Control, DBMS Structure.

9. DISTRIBUTED OPERATING SYSTEMS:

Network Operating Systems.

BECO5-III: MOBILE COMPUTING

1. INTRODUCTION

Applications, Replacement of wired networks, Location dependent services, Mobile and wireless devices, A short history of wireless communication, A market for mobile communications, Some open research topics, A simplified reference model

2. MOBILE CHANNEL CHARACTERIZATION

Fading and shadowing, communication issues , antennas, signal propagation, path loss of radio signals, multipart propagation, multiplexing, space division multiplexing, frequency division multiplexing, time division multiplexing, code division multiplexing, modulation, advanced frequency shift keying, multicarrier modulation , direct sequence spread spectrum,

3. REVIEW OF CELLULAR SCHEMES

Model and methodology, mobile computing topologies, networks and protocols, GSM, system architecture, network and switching subsystem, operation subsystem, radio interface, logical channels and frame hierarchy, handover, authentication, encryption , hscsd, umts and imt-2000, umts basic architecture, ultra fod mode, ultra tdd mode, SDMA, FDMA, TDMA.

4. MOBILITY MANAGEMENT

Mobile ip, entities and terminology, ip packet delivery, agent advertisement and discovery, optimizations, dynamic host configuration protocol, fast retransmit/fast recovery, transaction oriented TCP.

5. WIRELESS LAN AND DATA PCS, WIRING THE CAMPUS

Infrared vs. Radio transmission, infrastructure and ad hoc networks , direct sequence spread spectrum, medium access control layer, basic DFWMAC-DCF using CSMA/CA, user scenarios, mac layer, packet format, link management,

6. APPLICATION FRAMEWORKS

Architectures now and in the future, today's application architectures, architecture overview, service enablers, *service capability servers*, *application support servers*, personal service environment, personal service environment, service management,

7. EXPLOITING MOBILITY COMMERCIALY

Location-based services, positioning methods, terminal-based positioning: gps and a-gps, enhanced observed time difference (e-otd), network-based positioning: ul-toa, which solutions will we use, and what are the consequences?,

8. FILE SYSTEM, ACCESSING THE WORLD WIDE WEB

File systems, little work, ficus, mio-nfs, accessing the world wide web , hypertext markup language, some approaches that might help wireless access, system architectures, wireless application protocol, wireless data gram protocol, wireless transaction protocol, wsp/b over wtp, wsp/b as connectionless session service, wireless markup language, **WTP class 0, WMLScript**

9. PRIVACY AND ANONYMITY

How secure does it have to be?, securing the transmission, authentication, encryption, protecting the message integrity, gsm/gprs/3g network security, algorithm decision, security protocols and their wirelesusage, redundant security, making decisions and security perspectives.

BECO5-IV: FUZZY SET THEORY & APPLICATION

1. FUZZY SET THEORY

Introduction, Background, Uncertainty and Imprecision, Statistics and Random Processes, Uncertainty in Information, Fuzzy Sets and Membership, Chance Versus Ambiguity

2. FUZZY SETS-BASIC DEFINITIONS AND EXTENSIONS

Crisp Versus Fuzzy Sets, Example 1 Fuzzy Sets Versus Crisp Sets, Form Fuzzy Sets To Fuzzy Events, Fuzzy Set Operations, Properties Of Fuzzy Sets, Fuzzification Techniques, Alpha Cits

3. MEASURE OF FUZZYNESS

Fuzzy Measures, Belief And Plausibiltiy ,Evidence Theory, Probability Measures

4. THE EXTENSION PRINCIPAL AND APPLICATIONS, FUZZY NUMBERS

Extension Principle, Fuzzy Transform (Mapping), Fuzzy Numbers, Interval Analysis In Arithmetic, Approximate Methods Of Extension, DSW Algorithm

5. FUZZY RELATIONS AND FUZZY GRAPHS

Fuzzy Relations On Sets And Fuzzy Sets, Compositions Of Fuzzy Relations, Properties Of The Min-Max Composition , Reflexitivity, Symmetry, Transitivity, Fuzzy Graphs , Special Fuzzy Relations

6. FUZZY ANALYSIS

Fuzzy Functions On Fuzzy Sets, Extrema Of Fuzzy Functions, Integration Of Fuzzy Functions, Integration Of A (Crisp) Real- Valued Function Over A Fuzzy Interval, Fuzzy Differentiation

7. POSSIBILITY THEORY, FUZZY POSITIONING

Possibility Distributions as Fuzzy Sets, Fuzzy Positioning, Image Stabilization For Camcorders, Television Sets

8. FUZZY APPROXIMATE REASONING

Fuzzy Logic, Approximate Reasoning, Fuzzy Tautologies, Contradictions, Equivalence, and Logical Proofs, Other Forms of the Implication Operation, Other Forms of The Composition Operation

9. EXPERT SYSTEMS

Fuzzy Set and Expert Systems, Introduction to Expert Systems

10. FUZZY CONTROL

Review Of Control System Theory, Simple Fuzzy Logic Controllers, General Fuzzy Logic Controllers, Special Forms Of Fuzzy Logic Control System Models, Examples Of Fuzzy Control System Design, Classical Fuzzy Control Problem: Inverted Pendulum

11. PATTERN RECOGNITION, FUZZY SCENE ANALYSIS, FUZZY GRAMMARS AND AUTOMATA

Feature Analysis, Partitions of The Feature Space, Single Sample Identification, Multifeature Pattern Recognition, Fuzzy Scene Analysis, Syntactic Recognition

12. DECISION MAKING IN FUZZY ENVIRONMENT, FUZZY LINEAR AND GOAL PROGRAMMING

Fuzzy Decisions, Fuzzy Linear Programming, Symmetric Fuzzy LP, Fuzzy Dynamic Programming, Fuzzy Multi Criteria Analysis.
