GURUGRAM UNIVERSITY

SCHEME OF STUDIES AND EXAMINATION

M.TECH 2nd YEAR (ELECTRONICS & COMMUNICATION ENGINEERING)

SEMESTER 3rd

Sl. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	No of Credits
			L	T	P	Total	Marks of Class works	Theory	Practical	Total		
1	17ECE23C1	Neural Networks & Fuzzy Logics	4	0	-	4	50	100	-	150	**3**	**4**
2	17ECE23C2	CDMA	4	0	-	4	50	100	-	150	**3**	**4**
3	17ECE23C3	DISSERTATION (PHASE-I)	-	-	-	4	100	-	-	100		**2**
4	17ECE23C4	Seminar	-	-	-	2	50	-	-	50		**2**
5	17ECE23CL1	Project	-	-	2	2	50	-	50	100		**2**
6	17ECE23CL2	MATLAB Lab	-	-	2	2	50	-	50	100		**2**
7		OPEN ELECTIVE										**3**
		TOTAL										**21**

NOTE:

1. **Students will be allowed to use non-programmable scientific calculator. However, sharing of Calculator will not be permitted in the examination.**

2. **Students have to publish a research paper in a journal / conference on the basis of literature survey done in the semester.**

OPEN ELECTIVE: A candidate has to select this paper from the pool of open electives provided by the University.

GURUGRAM UNIVERSITY

SCHEME OF STUDIES AND EXAMINATION

M.TECH 2nd YEAR (ELECTRONICS & COMMUNICATION ENGINEERING)

SEMESTER 4th

Sl. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				No of Credits
			L	T	P	Total	Marks of Class works	Theory	Practical	Total	
	17ECE24C1	Dissertation and viva	-	-	-	-	250	-	500	750	**20**
		TOTAL	**-**	**-**	**-**	**-**	**250**	**-**	**500**	**750**	
		GRAND TOTAL									

NOTE:

1. **Students have to publish a research paper in a journal / conference of the research work done in the semester.**

17ECE23C1 **NEURAL NETWORKS & Fuzzy Logics**

L	T	P		Marks	Credits
4	-	-	Exams	: 100	4
			Sessionals	: 50	
			Total	: 150	4
			Duration of Exam	: 3 hrs.	

Course Outcomes:

CO1. To Expose the students to the concepts of feed forward neural networks

CO2. To provide adequate knowledge about feedback networks.

CO3. To teach about the concept of fuzziness involved in various systems. To provide adequate knowledge about fuzzy set theory.

CO4. To provide comprehensive knowledge of fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.

CO5. To provide adequate knowledge of application of fuzzy logic control to real time systems.

SECTION A

Introduction: Neural networks characteristics, History of development in neural networks principles, Artificial neural net terminology, Model of a neuron, Topology.

SECTION B

Learning Methods & Neural network models: types of learning, Supervised, Unsupervised, Re-inforcement learning. Knowledge, representation and acquisition. Basic Hop field model, Basic learning laws, Unsupervised learning, Competitive learning, K-means clustering algorithm, Kohonen's feature maps.

SECTION C

Artificial Neural Networks: Radial basis function neural networks, Basic learning laws in RBF nets, Recurrent back propagation. Introduction to counter propagation networks, CMAC network, and ART networks.

SECTION D

Fuzzy Logic: Basic concepts of fuzzy logic, Fuzzy vs. Crisp set, Linguistic variables, Membership functions, Fuzzy sets & Operations of fuzzy sets, Fuzzy IF- THEN rules, Variable inference techniques, De-Fuzzification, Basic fuzzy inference algorithm, Fuzzy system design, Industrial applications.

Text Books:

1. B. Yegnanarayana, " Artificial Neural Networks"PHI
2. J.M. Zurada, "Introduction to artificial neural systems", Jaico Pub.
3. ROSS J.T , "Fuzzy logic with engineering application", TMH

Reference Books:

1. Simon Haykin, "Neural Networks", PHI
2. Ahmad M.Ibrahim, "Introduction to applied Fuzzy Electronics", (PHI)
3. P.D. wasserman , "Neural computing theory & practice", (ANZA PUB).

NOTE: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

17ECE23C2 **CDMA SYSTEMS**

L	T	P		Marks	Credits
4	-	-	Exams :	100	4
			Sessionals :	50	
			Total :	150	4
			Duration of Exam :	3 hrs.	

Course Outcome :- The students shall have

CO1. Gained the fundamental knowledge about Planning of CDMA cellular communication in designing and optimization.

CO2. Learned futuristic version of CDMA. Will benefit as system engineer in cellular technology.
CO3 learnt about CDMA transmitter and receiver and their desired characteristics

SECTION A

Direct sequence and frequency hopped spread spectrum, spreading sequence and their correlation functions, Acquisition and tracking of spread spectrum signals.

SECTION B

Error probability for DS-CDMA, on AWGN channels, DS- CDMA on frequency selective fading, channels, Performance analysis of cellular CDMA

SECTION C

Capacity estimation, Power control, effect of imperfect power control on DS CDMA performance, Soft Handoffs.

SECTION D

Spreading /coding tradeoffs, multi-carrier CDMA, IS-95 CDMA system, third generation CDMA systems, multi-user detection.

Text Books:

1. Andrew J. Viterbi, “CDMA Principles of spread spectrum communications”, Addison Wesley 1995.

2. J.S. Lee and L.E. Miller, “CDMA system Engineering handbook”, Artech house 1998.

Reference Books:

1. Garg, “CDMA : 2000 : Cellular/ PCS system Implementation”, Pearson

2. Steve Lee, “Spread spectrum CDMA”, TMH

NOTE: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

17ECE23C3 DISSERTATION (PHASE-I)

L	T	P		Marks	Credits
-	-	4	Exams :		
			Sessionals :	100	
			Total :	100	2
			Duration of Exam :	3 hrs.	

Every student will carry out dissertation under the supervision of a Supervisor(s). The topic shall be approved by a Committee constituted by the Head of the concerned Deptt.

Every student will be required to present two seminar talks, first at the beginning of the Dissertation (Phase-I) to present the scope of the work and to finalize the topic, and second towards the end of the semester, presenting the work carried out by him/her in the semester. The committee constituted will screen both the presentations so as to award the

sessional grades out of A+, A, B, C, D and E. A student scoring 'F' grade shall have to improve this grade before continuing his/her Dissertation in the 4th semester failing which he/she shall have to repeat the Dissertation (Phase-I) next time in the regular 3rd semester

COURSE OUTCOMES:

By the end of this course every student is expected to be able to

CO1 understand the process of research.

CO2 do literature survey to identify a research problem.

CO3 communicate and discuss research ideas.

CO4 plan and write dissertation synopsis.

17ECE23C4 **SEMINAR**

L	T	P		Marks	Credits
-	-	2	Sessional :	50	2
			Total :	50	2

Every student will be required to present a seminar talk on a topic approved by the Deptt. except on his/her dissertation. The committee constituted by the Head of the Deptt. will evaluate the presentation and will award one of the grades out of A+,A,B,C,D and E.

A Student who is awarded the 'F' grade will be required to repeat the seminar on the same topic.

At the end of this course the student shall be able to

CO1 prepare the topic and contents on a technical topic

CO2 speak on a technical topic effectively

CO3 enhance communication skills

17ECE23CL2 **MATLAB Lab**

L	T	P	Total Credits: 2
-	-	2	

Course Outcomes:

By the end of this course the students will have

CO1 Ability to express programming & simulation for engineering problems.

CO2 Ability to find importance of this software for Lab Experimentation.

CO3 Articulate importance of software's in research by simulation work.

CO4 In-depth knowledge of providing virtual instruments on LabVIEW Environment.

CO5 Ability to write basic mathematical ,electrical ,electronic problems in Matlab.

CO6 Ability to simulate basic electrical circuit in Simulink.

UNIT 1 MATLAB FUNDAMENTALS: Introduction, platforms and versions, launching MATLAB, window, help features, types of file, creating directory and saving files, notation, syntax and operations, constants, variables and expression, some built in function, commands, problems.

UNIT 2 VECTORS & MATRICS: Addition, subtraction, multiplication, vector products and transpose, commands, problems.

UNIT 3 MATLAB PROGRAMMING: Input-Output Statements: data input, interactive input, output command. Programming in M files, script and function files, variables, data types, operators, control structures

UNIT 4 GRAPHICS USING MATLAB: Creating plots, 2-D, 3-D, multiple plots, editing plots, visualizing function of two variables, image Printing graphics, handle graphics, GUI, problems.

UNIT 5 INTRODUCTION TO TOOLBOXES: The symbolic math toolbox, control system toolbox, signal processing toolbox, communication toolbox, MATLAB applications, animation, problems.

UNIT 6 SIMULINK BASICS: Introduction, simulink model editor, simulink library, blocksets, running a simulation, building simple model, problems with models.

Reference Books: 1. MATLAB and its Applications in Engineering, Raj Kumar Bansal, Ashok Kumar Goel, Manoj Kumar, Pearson Education.

2. Partha S Mallick, Matlab and Simulink: Introduction to Applications, 2nd edi, SCITECH.

3. K K Mishra, Numerical Technique Lab Matlab Based Experiments, I K international publishing house. NOTE: At least 10 experiments are to be performed by students in the semester as per the

17ECE24C1 **DISSERTATION**

L	T	P		Marks	Credits
-	-	20	Sessionals :	250	
			Practical Exam :	500	
			Total :	750	20
			Duration of Exam. :	3 hours.	

The Dissertation Phase-1 will be continued as dissertation in 4th Semester. The award of sessional grades out of A+, A, B, C, D and E will be done by an internal Committee constituted by the Head of the Deptt.

This assessment shall be based on presentation (s), report, etc. before this committee. In case a student scores 'F' –grade in the sessional, failing which he/ she will not be allowed to submit the dissertation.

At the end of the semester, every student will be required to submit three bound copies of

his/her Master's dissertation of the office of the concerned Department. Out of these, one copy will be kept for department record & one copy shall be for the supervisor. A copy of the dissertation will be sent to the external examiner by mail by the concerned department, after his/her appointment and intimation from the university. Dissertation will be evaluated by a committee of examiners consisting of the Head of the Department, dissertation supervisor(s) and one external examiner. There shall be no requirement of a separate evaluation report on the Master Dissertation from the external examiner.

The external examiner shall be appointed by the University from a panel of examiners submitted by the respective Head of Deptt., to the Chairman, Board of Studies. In case the external examiner so appointed by the University does not turn up, the Director/ Principal of the concerned college, on the recommendation of the concerned Head of the Deptt. Shall be authorized, on behalf of the University., to appointed an external examiner from some other institution.

The student will defend his/her dissertation through presentation before this committee and the committee will award one of the grades out of A+, A, B, C, D and E Student scoring 'F' grade in the exam shall have to resubmit his/her Dissertation after making all correction / improvements and this dissertation shall be evaluated as above. **Note:** The Scheme of awarding the Grades to the student in the course will be supplied by the University to the examiner(s).

COURSE OUTCOMES:

By the end of this course every student is expected to be able to

CO1 handle research problems and use modern research tools/methods.

CO2 analyse and review the existing literature on a research problem.

CO3 design and conduct experiments.

CO4 write dissertation and technical reports.

CO5 publish research papers.