

# **Indira Gandhi University, Meerpur Rewari**



## **Syllabus for M.Tech. – Final Year (Semester III and IV)** (Electronics & Communication Engineering)

**Session –w.e.f. 2020-2021**

# INDIRA GANDHI UNIVERSITY, MEERPUR REWARI

## SCHEME OF STUDIES AND EXAMINATION M.TECH 2nd YEAR (ELECTRONICS & COMMUNICATION) SEMESTER 3rd

Sl. No	Course Code	Subject	Credit Pattern				Examination Schedule (Marks)				Duration of Exam (Hours)	No of Hours /week
			L	T	P	Total Credits	Marks of Class work	Theory	Practical	Total		
1	MECE231	Neural Networks & Fuzzy Logics	4	0	-	4	50	100	-	150	3	4
2	MECE232	CDMA Systems	4	0	-	4	50	100	-	150	3	4
3	MECE233	Dissertation (Phase-I)	-	-	-	4	100	-	-	100	3	4
4	MECE234	Seminar	-	-	-	1	-	-	-	25	-	-
5	MECE235	Project	-	-	2	2	50	-	50	100	3	4
6	MECE236	Matlab Lab	-	-	2	2	50	-	50	100	-	-
7		Open Elective	-	-	-	3	-	-	-	-	3	-
8	MECE237	Self Study Paper				1	-			25		-
		<b>TOTAL</b>	<b>21</b>									

### 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.

# INDIRA GANDHI UNIVERSITY, MEERPUR REWARI

## SCHEME OF STUDIES AND EXAMINATION M.TECH 2nd YEAR (ELECTRONICS & COMMUNICATION) 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	
	MECE241	Dissertation and viva	-	-	-	-	250	-	500	750	<b>20</b>
		<b>TOTAL</b>	-	-	-	-	<b>250</b>	-	<b>500</b>	<b>750</b>	
		<b>GRAND TOTAL</b>									

NOTE:

1. Students have to publish a research paper in a UGC approved journal of the research work done in the semester.
2. Students will have to submit a soft copy of their thesis with the hard copies.
3. Students have to submit a plagiarism report with the thesis report obtained from Turnitin software. This software is available in IGU Library. Upto 25% of similarity of matter is permitted.

**MECE231**

## **NEURAL NETWORKS & Fuzzy Logics**

L	T	P
4	-	-

Marks	Credits
Exams : 100	4
Sessionals : 50	
Total : 150	

Duration of Exam : 3 hrs.

### **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.

**MECE232****CDMA SYSTEMS**

L T P  
4 - -

Marks Credits

Exams : 100 4

Sessionals : 50

Total : 150

Duration of Exam : 3 hrs.

**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.

**MECE233****DISSERTATION (PHASE-I)**

L T P  
- - 4

Marks Credits

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

**MECE234****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.

**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 & MATRICES:** 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



**MECE241****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 4<sup>th</sup> 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).