INVERSITY BAREILLY BUILDING VIBRANT PERSONALITIES

COURSE STRUCTURE DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAAC CRITERIA 1.2.2



INSTRUCTION SHEET- M. TECH. IN ELECTRONIC AND COMMUNCATION [EFFECTIVE FROM: 2016-17]



Scheme of Instruction & Syllabi Of MASTER OF TECHNOLGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

(Effective From 2016-2017)

(Mr. Chandan Gupta) HOD, ECE (Dr. R.K. Shukla) Dean (Academics) (Dr. YDS Arya) Pro- Vice-Chancellor (Prof. JagdishRai) Vice Chancellor

Invertis Institute of Engineering & Technology INVERTIS UNIVERSITY

Invertis Village, Bareilly-Lucknow NH-24, Bareilly

INSTRUCTION SHEET- M.TECH. IN ELECTRONIC AND COMMUNCATION JEFFECTIVE FROM: 2016-17]



STUDY & EVALUATION SCHEME

M.Tech. in Electronics & Communication Engineering [Effective from the academic year 2016-2017]

YEAR I, SEMESTER-I

	Course	Charles Martines		Periods		40	Evaluat	ion Scher	Subject	37.52	
S.No.	Code	Subjects				Sessional Marks			End	Subject Total	Credits
			L	Т	Р	СТ	TA	Sub. Total	Sem.		
1	MEC-101	Advanced Digital Signal Processing	3	1	0	20	10	30	70	100	4
2	MEC-102	Satellite Communication & Navigation Systems	3	1	0	20	10	30	70	100	4
3	MEC-103	Advanced Microwave Antennas	3	1	0	20	10	30	70	100	4
4	MEC-104	Information and Coding Theory	3	1	0	20	10	30	70	100	4
5	MEC-105	Microprocessor and Engineering Applications	3	1	0	20	10	30	70	100	4
6	MEC-151	Signal Processing & Microprocessor Lab	0	0	2	-	-	10	15	25	1
7	MEC-152	Pre-Assigned Project &Colloquium-I	0	2	0	-	-	25	-	25	1
	and the face	TOTAL	15	7	2	100	100	200	350	550	22

YEAR I, SEMESTER-II

	Course			Periods			Evaluat	ion Scher			
S.No.	Code	Subjects0				Sessional Marks			End	Subject	Credits
			L	Т	P	СТ	TA	Sub. Total	Sem.		
1	MEC-201	Image Processing	3	1	0	20	10	30	70	100	4
2	MEC-202	Biomedical Signal Processing	3	1	0	20	10	30	70	100	4
3	MEC-203	Wireless Communication and Data Networks	3	1	0	20	10	30	70	100	4
4		Elective –I	3	1	0	20	10	30	70	100	4
5		Elective –II	3	1	0	20	10	30	70	100	4
6	MEC-251	Image processing Lab	0	0	2	-	20	20	30	50	2
		TOTAL	15	7	0	100	100	200	350	550	22

YEAR II, SEMESTER-III

	Course			Periods			Evaluat	ion Schen			
S.No.	Code	Subjects				Sessional Marks			End	Subject Total	Credits
			L	Т	P	СТ	TA	Sub. Total	Sem.		
1		Elective –III	3	1	0	20	10	30	70	100	4
2		Elective -IV	3	1	0	20	10	30	70	100	4
3	MEC-351	Colloquium & Research Review Paper-III	0	2	0	•	50	50		50	2
4	MEC-352	Preliminary Thesis	0	8	0		200	200	-	200	8
		TOTAL	6	12	0	40	270	310	140	450	18

		YEAR II,	, SEMES	TER	-17		10225				i.
S.No.	Course		Periods			Evaluat	ion Schen	ne	6.11.	Credits	
	Code	Subjects					sional N	larks	End		Total
			L	Т	P	СТ	TA	Sub. Total	Sem.		
1	MEC-451	Thesis Work	0	16	0		100	100	300	400	16
		TOTAL	0	16	0	-	100	100	300	400	16

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INSTRUCTION SHEET- M.TECH. IN ELECTRONIC AND COMMUNCATION [EFFECTIVE FROM: 2016-17]



LIST OF ELECTIVE SUBJECTS

ELECTIVE-I

MEC-111-High Speed Devices & Circuits MEC-112-CMOS Circuit and VLSI Design MEC-113-Digital Communication Systems & Design MEC-114-Wireless AD-HOC Networks

ELECTIVE-II

MEC-211- Nano Technology MEC-212- Advanced Optical Fiber Communication MEC-213- Cloud Computing MEC-214- Microwave Theory

ELECTIVE-III

MEC-311- Neural Networks and Fuzzy Logic MEC-312-Reliability of Electronics & Communication Systems MEC-313-Opto-Electronic Devices & Sensors MEC-314- Advanced Communication Networks

ELECTIVE-IV

MEC-321- Wireless Sensor Networks& Internet of Things (WSN &IoT) MEC-322-Microwave Integrated Circuits MEC-323- Low Power VLSI Design MEC-324-Mobile Computing Technology

INVERTIS UNIVERSITY, BAREILLY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHEME OF INSTRUCTIONS AND DETAILED SYLLABI OF B.TECH PROGRAM IN ELECTRONICS AND COMMUNICATION ENGINEERING

Invertis Universi', Bareilly

Effective from 2019-2020 and onwards

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Vision

To provide the students excellent education for developing them into high class electronics engineers so that they could meet the challenges of modern industry and blossom into extraordinary entrepreneurs.

Mission

- To create learning, development and testing environment to meet ever challenging needs of electronic industry.
- To become a global partner in training human resources in the fields of chip design, instrumentation and networking.
- To be highly competent in various fields of Electronics and Communication engineeringthrough the best breed laboratory facilities.
- To associate with internationally reputed Institutions for academic excellence and collaborative research.

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PROGRAM EDUCATIONAL OBJECTIVES

PEO1	Analyze, plan and apply the acquired knowledge in basic sciences and mathematics in solving the problems with technical, economic, environmental and social contexts.
PE02	Design and build modern communication systems as per the requirements stated.
PEO3	Design, build and test analog & digital electronic systems.
PEO4	Work in a teamusing technical knowledge, tools and environments to achieve project objectives.
PEO5	Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

PROGRAM OUTCOMES:

At the end of the program the student will be able to:

PO1	Apply basic science and mathematics to analyze complex engineering problems.
PO2	Employ necessary techniques, hardware and software tools for engineering applications.
PO3	Synthesize solutions for existing problems within practical constraints.
PO4	Gather requirement specifications, design and test electronic systems.
PO5	Communicate effectively in diverse groups and exhibit leadership qualities
PO6	Understand and practice professional ethics.
PO7	Exhibit responsibility in professional, ethical, legal, security and social issues
PO8	Work in a team using technical skills, common tools and environments to achieve the objective of the project.
PO9	Apply management principles to manage projects in multidisciplinary environment
PO10	Pursue life-long learning as a means of enhancing knowledge and skills for continuous professional advancement.

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SYLLABUS

B.Tech.(Electronics and Communication Engineering) Course Structure

B. Tech. I - Year I - Semester

S.No.	Course code	Course title	L	T	Р	credits	Cat. Code
1	BAS-103	Mathematics-I	3	1	0	4	
· 2	BAS-102 or BME- 102	Engg. Chemistry or Engg. Mechanics	3	1	0	4	
3	BEE-101 or BCS- 101	Electrical Engg. or Computer Fundamentals & Programming in C	3	1	0	4	
4	BEC-101 or BHU- 101	Electronics Engineering or Professional Communication	3	1	0	4	
5	BAS-101	Engg. Physics-I	3	1	0	4	
6	BME-101 or BAS- 104	Manufacturing Process or Environment & Ecology	2	0	0	2	
7	BAS-152 or BME- 152	Engg. Chemistry Lab or Engg. Mechanics Lab	0	0	2	1	
8	BEE-151 or BCS- 151	Electrical Engg Lab or Computer Fundamentals & Programming in C Lab	0	0	2	1	
9	BME-151 or BCE- 151	Workshop Practice or Engg. Drawing & Computer Graphics	0	1	3	2	
10	BAS-151 or BHU- 151	Physics Lab or Professional Communication Lab	0	0	2	1	
11	GP-101	General Proficiency	-	-	-	1	
		TOTAL	17	6	9	28	

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S.No.	Course code	Course title	L	Т	P	Credits	Cat. Code
1	BAS-203	Mathematics-II	3	1	0	4	
2	BME-202 or BAS-202	Engg. Mechanics -I or Engg. Chemistry	3	1	0	4	
3	BCS-201 or BEE-201	Computer Fundamentals & Programming in C or Electrical Engg.	3	1	0	4	
4	BHU-201 or BEC-201	Professional Communication or Electronics Engineering	3	1	0	4	
5	BAS-201	Engg. Physics-II	3	1	0	4	
6	BAS-201 or BME-201	Environment & Ecology or Manufacturing Process	2	0	0	2	
7	BCE-251 or BME-251	Engg. Drawing & Computer Graphics or Workshop Practice	0	1	3	2	
8	BME-252 or BAS-252	Engg. Mechanics Lab or Engg. Chemistry Lab	0	0	2	1	
9	BAS-251 or BEE-251	Computer Fundamentals & Programming in C Lab or Electrical Engg. Lab	0	0	2	1	
10	BHU-251 or BAS-251	Professional Communication Lab or Physics Lab	0	0	2	1	
11	GP-201	General Proficiency	-	-	-	1	
		Total	17	6	9	28	

B.Tech. I - Year II - Semester

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S.No.	Course code	Course Title	L	Т	Р	Credits	Cat. code
1	BHU- 301/401	Industrial Psychology/ Industrial sociology	2	0	0	2	
2	BHU- 302/402	Science Elective/ Mathematics-III	3	1	0	4	
3	BEC-304	Electromagnetic Field Theory	3	1	0	4	
4	BEC-301	Fundamentals of Electronic Devices	3	1	0	4	
5	BEC-302	Digital Electronics	3	1	0	4	nander (
6	BEE-302/ BEC-303	(EE &EEE) Electrical Measurements and Instrumentation/(EC) Electronics Measurements &Instrumentation	. 3	1	0	4	
7	BEC-351	Electronics Lab-I	0	0	2	1	
8	BEC-352/ BEE-351	MATLAB Programming (EE &EEE)/Digital Electronics Lab (EC)	0	0	2	1	
9	BEE-352/ BEC-353	Electrical Measurement & Instrumentation Lab(EE & EEE)/Electronics Measurement & Instrumentation Lab(EC)	0	0	2	1	
10	GP-301	General Proficiency	-	-	-	1	
		Total	17	5	6	26	

B.Tech. II - Year III - Semester



B.Tech. II	year IV	semester
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S.No.	Course code	Course Title	L	Т	Р	Credits	Cat. code
1	BHU- 301/401	Industrial Psychology/Industrial Sociology	2	0	0	2	
2	BOE31- 38/BOE41- 48/BAS 301/401	Science Elective/Mathematics-III	3	1	0	4	
3	BCS-405	Computer Organization	3	1	0	4	
4	BEC-401	Signals and Systems	3	1	0	4	
5	BEC-402	Network Analysis and Synthesis	3	1	0	4	
6	BEC-403	Electronic Circuits	3	1	0	4	
7	BCS-455	Computer Organization Lab	0	0	2	1	
8	BEC-453	Electronics Circuit Lab	0	0	2	1	
9	BEC-456	PCB Lab	0	0	2	1	
10	GP-401	General Proficiency	-	-	-	1	
		Total	17	5	6	26	

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S.No.	Course code	Course Title	L	Т	Р	Credits	Cat. code
1	BHU-501	Engineering and Managerial Economics	2	0	0	2	
2	BEC-501	Antenna & Wave Propagation	3	1	0	4	
3	BIC-501	Control Systems –I	3	1	0	4	
4	BEC-502	Principles of Communication	3	1	0	4	
5	BEC-503	Fundamentals of Power Electronics	3	1	0	4	
6	BEC-504	Microprocessors	3	1	0	4	
7	BIC-551	Control System Lab-I	0	0	2	1	1.00
8	BEC-552	Communication Lab-I	0	0	2	1	
9	BEC-554	Microprocessor Lab	0	0	2	1	
10	GP 501	General Proficiency	-	-	-	1	
		Total	17	5	6	26	

B.Tech. III year V semester

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S.No.	Course code	Course Title	L	Т	Р	Credits	Cat. code
1	BHU-601	Industrial Management	2	0	0	2	
2	-	Departmental Elective	3	1	0	4	
3	BEC-601	Digital Communication	3	1	0	4	
4	BEC-602	Digital Signal Processing	3	1	0	4	
5	BEC-603	Integrated Circuits	3	1	0	4	
6	BEC-604	Microwave Engg.	3	1	0	4	
7	BEC-651	Digital Communication Lab	0	0	2	1	tha shiris
8	BEC-652	DSP Lab	0	0	2	1	
9	BEC-653	Integrated Circuits Lab	0	0	2	1	
10	GP-601	General Proficiency	-	-	-	1	
		Total	17	5	6	26	

B.Tech. III year VI semester

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B.Tech. IV year VII semester

S.No.	Course code	Course Title	L	Т	Р	Credits	Cat. code
1		Open Elective-I**	3	1	0	4	
2	· · · · · ·	Departmental Elective-II	3	1	0	4	
3	BEC-701	Optical Communication	3	1	0	4	
4	BEC-702	Data Communication Network	3	1	0	4	
5	BEC-703	VLSI Design	3	1	0	4	
6	BEC-751	Microwave and Fiber Optics Lab	0	0	2	1	
7	BEC-752	Electronics Circuit Design	0	0	2	1	
8	BEC-753	Industrial Training Seminar	0	0	2	1	e Andre e
9	BEC-754	Minor Project	2	-	-	2	
10	GP-701	General Proficiency	-	-	-	1	
		Total	15	5	6	26	

B.Tech. IV year VIII semester

S.No.	Course code	Course Title	L	Т	Р	Credits	Cat. code
1		Open Elective-II**	3	1	0	4	
2		Departmental ElectiveIII	3	1	0	4	
3	BEC-801	Wireless & Mobile Communication	3	1	0	4	
4	BEC-802	Electronics Switching	3	1	0	4	
5	BEC-851	Projects	<u>.</u> *		-	9	
6	GP-801	General Proficiency	-		-	1	
		Total	12	4	0	26	6.15.11



List of Electives

II year III semester

BOE-031/041 Fuzzy Logic BOE-032/042 Nano Physics EOE-033/043 Laser Systems and Applications BOE-034/044 Space Sciences BOE-035/045 Polymer Science and Technology BOE-036/046 Nuclear Science BOE-037/047 Material Science BOE-038/048 Discrete Mathematics

III year VI semester

BIC-021 Microcontroller

BEC-022 Analog Signal Processing

BEC-023 Advanced Semiconductor Devices

IV year VII semester

BOE-071 Introduction to Biotechnology

BOE-073 Non Linear Dynamic

BEC-071 Satellite Communication

BEC-072 Digital Image Processing

BEC-073 Optical Networks

IV year VIII semester

BEC- 081 Digital System Design Using VHDL
BEC-082 Speech Processing
BEC-083 Introduction to Radar systems
BOE-081 Non-Conventional Energy
BOE-082 Reliability of Electronics
BOE-083 Automation and Robotics



List of Specializations

Specialization - 1: FINANCE

MBA 311 – Tax planning and Management MBA 312 -Security Analysis & Portfolio Management MBA 411- Corporate Restructuring MBA 412 Parking Operations Management

MBA 412 Banking Operations Management MBA 413 -Financial Market & Services

Specialization -2: MARKETING

MBA316: Sales and Distribution MBA317: Service Management MBA416: CB and IMC MBA417: Rural Marketing MBA418: International Marketing

Specialization -3: HUMAN RESOURCE

MBA321: Organizational Change and Development

MBA322: Training & Development and competency mapping

MBA421: Employee welfare and Labour Legislation

MBA422: Strategic Human Resource Management

MBA423: Performance Appraisal and compensation Management

Specialization-4: INFORMATION TECHNOLOGY

MBA336: Business Intelligence and Data Mining

MBA337: E-Commerce

MBA436: Big Data Analytics

MBA437: IT Project Management

MBA438: Data communication and Networking security

Specialization -5: INTERNATIONAL BUSINESS MBA326: International Business

MBA327: EXIM Procedure & Documentation

MBA426: International Financial Management

MBA427: Global Business Environment

MBA428: International Logistics

Specialization -6: HOSPITALITY & TOURISM MBA331: Introduction to Tourism Industry MBA332: Hospitality and Tourism Planning

MBA431: Travel agency and tour operators MBA432: Hospitality Information System MBA433: Tourist Products design and destination development **Specialization -7: RETAIL MANAGEMENT** MBA341: Retail Science MBA342: Pricing and Branding MBA441: International Retailing MBA442: Merchandising and Mall Management MBA443: Acquiring, Maintaining and Retaining Customer **Specialization -8: HEALTHCARE MANAGEMENT** MBA351: Hospital Planning MBA352: Medical Terminology and Procedures MBA451: Hospital Administration MBA452: Laws Related to Hospital and Medical Services MBA453: Healthcare and Administration of Clinical and non-clinical Services

Specialization-9: Project Management

Mba371: project formulation and appraisal Mba372: construction Planning, scheduling and control. Mba471: construction personnel management Mba472: construction project management Mba473: project safety management Secialization-10: Rural and Agriculture

Management

Mba376: rural economy Mba377: basics of rural and agricultural

marketing

Mba476:distribution strategies for rural and agricultural marketing

Mba477: evolution of agricultural marketing in India

Mba478: rural and agricultural financing

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Sl. No.	Paper Code MBA301	Paper Paper Name Code BA301 Strategic Management	L+T+P 4+1+0	Maximum marks			Credit
1				70	30	100	4
2	MBA302	Event Management*	2+1+2	40	60	100	4
3	-	Spec. Group 1 Paper 1	4+1+0	70	30	100	4
4		Spec. Group 1 Paper 2	4+1+0	70	30	100	4
5		Spec. Group 2 Paper 1	4+1+0	70	30	100	4
6		Spec. Group 2 Paper 2	4+1+0	70	30	100	4
7	MBA396	Hands on Experience Viva**		100		100	4
	-	Total		490	210	700	28

Year-4 Semester-9

*Event Management being a highly practical subject, student's Organizing capacity evaluation become important. The students will be divided into group of four and these groups are expected to organize at-least one event. Evaluation of the group will be based on the report submitted by the group and viva will be conducted for individual assessment.

It is therefore necessary to reduce the weightage of external written examination to 40 marks and event organized assessment to 60 Marks. Out of 60 marks UTs consist of 20 marks and the rest 40 marks will be on viva of students on their event management experience.

Sl. No.	Paper Code	Paper Name L+T+P	Ma ma	Credit			
1		Spec. Group 1 Paper 3	4+1+0	70	30	100	4
2		Spec. Group 1 Paper 4	4+1+0	70	30	100	4
3		Spec. Group 1 Paper 5	4+1+0	70	30	100	4
4		Spec. Group 2 Paper 3	4+1+0	70	30	100	4
5		Spec. Group 2 Paper 4	4+1+0	70	30	100	4
6		Spec. Group 2 Paper 5	4+1+0	70	30	100	4
7	MBA496	Comprehensive Viva		100		100	4
		Total		520	180	700	28

Year-4 Semester-10

Note: Students required choosing any two Specializations out of TEN offering by the University. First Specialization chosen by student will be treated as Spec. Group 1 and second Specialization will be treated as Spec. Group 2.

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Year -3 Semester-7

SI. No.	Paper Code	Paper Name	L+T+P	Maxi	mum	mark	KS .	Credit
				E	Ι	P	Τ	
1	MBA101	Management- Micro and Macro	4+1+0	70	30		100	4
2	MBA102	Market Science	4+1+0	70	30		100	4
3	MBA104	Recording and Analysis of Business Operations	4+1+0	70	30		100	4
4	MBA105	Micro Economics & Economic Planning	4+1+0	70	30		100	4
5	Paper B.Tech.	EC1	4+1+0	70	30		100	4
6	Paper B.Tech.	EC2	4+1+0	70	30		100	4
		Total		420*	180*		600*	24*

* Two Paper from Btech will be studied by Students in this Semester based on their Course. Year-3 Semester-8

Sl. No.	Paper Code	Paper Name	L+T+P	Max mar	timum ks	l	Credit
1	MD 4 201	Management	4.1.0		20	100	
1	WIBA201	Management Science	4+1+0	/0	30	100	4
2	MBA202	Market Intelligence	4+1+0	70	30	100	4
3	MBA203	Identification, addition and delivery of Value	4+1+0	70	30	100	4
4	MBA204	Economics of Human Resource	4+1+0	70	30	100	4
5	MBA205	Legal Issues in Business	4+1+0	70	30	100	4
6	MBA206	Financial Issues	4+1+0	70	30	100	. 4
7	MBA207	Professional Communications and Aptitude	4+1+0	70	30	100	4
		Total		480	210	700	28

**After 2nd Semester, students will undergo 8 weeks summer training compulsorily in Public Sector undertakings or Private Sector, known as Hands on Experience. 100 marks will be on viva of students on their management experience in 3rd Semester.

This is the policy of the university not to allocate students in their home town. In case of extraordinary circumstances specific permission will be necessary from Hon'ble Chancellor.

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INVERTIS UNIVERSITY, BAREILLY

PROPOSED SYLLABUS FOR

B.Tech. (EC) + MBA

As Per Course Structure to Be Effective From Academic Year 2019 Onward

Registrar Invertis University Bareilly

(PHDEC-IOLI) NEURAL NETWORK AND FUZZY LOGIC

Neural Networks

Introductions to neurons, Classification of neurons, Introduction to neural networks, Modeling of neural networks based on soft and hard neurons, Different network configuration, Feed forward and recurrent network, Training algorithms, Learning-supervised and unsupervised. Neural network application in control, Identification, Pattern recognition system, Modeling and state estimation, Decision based on training of neurons.

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Fuzzy Logic

Fuzzy logic concepts, Fuzzy sets, Fuzzy relations and membership functions, Fuzzy network, Defuzzification, Fuzzy controllers.

Genetic Algorithm

Introduction, Gene, Mutation, Genetic algorithm concepts.

Approved le

arch in Electronics and Communication

Low Power CMIOS Logic Corcuits: Introduction Overview of Power Consumption Low - Power Low Power Chicks and scaling Essimation Overview of Power Consumption Low Power Design through whitage scaling Essimation and Optimization of Switching activity Recution of Power Consumption Low Power Design through the and Adiabatic Logic Carcuits Switched Capacitan to an interaction could concuts and to an or an interaction of an interaction of a state of the state o Hoc Testable League A Basic schuctures of VHDL Combinational circuits, Sequential circuits RTL Design with a structures situates VHOL Essential Terminologies

MODULEII

Digital Signal Processing: Signal Processing, transforms and statistical signal processing Image Segmentation Introduction, point, line and edge detection, thresholding, region based

Image Representation and Description. Image representation, boundary descriptors, regional

descriptors, principal components for description, relational descriptors Image Analysis Patterns and patiern classes scend segmentation and labeling, counting objects, perimeter measurements, boundary following, projection, Hough transform, least squares and Eigenvector line fitting shapes of regions, morphological operations, Fourier transforms, color.

MODULE III

Wireless Communication: Introduction to wireless communications systems, comparisons & trends. Cellular concepts frequency reuse, strategies, interference & system capacity, trucking & grade of service, improving coverage & capacity in cellular systems.

Multiple Access Techniques for Wireless Communication:

FDMA, TDMA, SSMA (FHMA/CDMA/Hybrid techniques) SDMA technique(AS applicable to wireless communications). Packet radio access protocols, CSMA protocols, reservation protocols capture effect in packet radio, capacity of cellular systems

References:

1. Programming in MATLAB for Engineers, Stephen J Chapman, Cengage Learning

2. Digital Image Processing using MATLAB, Rafael C. Gonzalez, Richard E. Woods, Steven L.

3. Digital Signal Processing: A MATLAB Based Approach, Vinay K. Ingale, John G.Prokis.

4. Digital Image Processing, Rafael C. Gonzalez, Richard E. Woods, Pearson Education 5. Wireless O 5. Wireless Communication and Networking William Stallings, PHI 2003

6. Wireless Communication and Networking Wintern Codore, S. Rappaport, PHI, 2nd Edn. 7. Doubles D

an Abbrauce

7. Douglas Perry, "VHDL- Programming by examples", MGH 8. "Provide Company Stream Esha

8. "Principle of CMOS VLSI design", Neil Weste, Kamran Esharghian, Addison Wesley. 9. S. M. Szent and VLSI design", Neil Weste, Kamran Esharghian, Addison Wesley. 9. S. M. Sze, "VLSI Technology", 2nd Edition, McGraw -Hill Publication. 10.J. D. Plume 10.J. D. Plummer, M. D. Deal and Peter B. Griffin, "Silicon VLSI Technology: practice and Fundamentals. T/ 14

practice and modelling", Pearson Education.

DRM-101 RESEARCH METHODOLOGY for Engineering Stream

UNITI

Research Topic: selection of problems, stages in the execution of research, preparation of manuscript and report writing. Search engines: google, pubmed, google scholar, EMBL, etc. Publication of Report in Journals: Standard of research journals, impact factor, citation index, H index, and more. Proof reading, reading journals and review.

UNIT II

Introduction of computer science- Database management systems, presentation graphics, management of data by office applications: MS-office, MS-Word, MS-Excel, and MS-PowerPoint. Generation and analysis of data, basics of softwares: Matlab and Labview.

LaTeX overview – document classes, Packages, document environment, Block structure, and special pages.

UNIT III

Measures of dispersion: sampling methods: random sampling - types of variables: qualitative and quantitative variables - continuous and discontinuous variables - scaling method – mean - standard deviation-standard error - coefficient of variation. Comparison of means: chi square test, student's t test and ANOVA.

UNIT IV

Spectrophotometer: principle and applications, Ultra violet, Infra Red, 1H, Nuclear magnetic resonance (NMR), fundamental and procedure of chromatography. Principle and application of electron microscopy, scanning electron microscopy, transmission electron microscopy, X-ray diffraction.

REFERENCE BOOKS

- Statistical methods, Snedecor, G, W. and W.G. Cohran, 1978. Oxford and IBH publishing CO Pvt. Ltd.
- Biometry, Sokal, R.R. and F.J.Rohlf, 1981. W.H. Freeman, NewYork.
- Authoring a PhD, thesis: how to plan, draft, write and finish a doctoral dissertation, Duncary, P. 2003. Macmillan, pp 256.
- Biostatistical analysis, Zar, J.H., 1996. Prentice Hall, Uppar Saddle River, newjersy, USA.
- Scientific courses and presentations, Martha Davis, 2005. Academic press, Tokyo.pp.356

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