VAAGDEVI COLLEGE OF ENGINEERING
AUTONOMOUS
Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S), www.vaagdevi.edu.in

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

VISION OF THE DEPARTMENT

- Towards a Global Knowledge Hub, striving continuously in pursuit of excellence in Education, Research, Entrepreneurship and Technological services to the society in the field of ECE.

MISSION OF THE DEPARTMENT

- To turn out full-fledged Engineers in the field of Electronics & Communication Engineering with an overall back-ground suitable for making a successful career either in industry/research or higher education in India and abroad.
- Imparting total quality education to develop innovative, entrepreneurial and professionals fit for globally competitive environment. Fostering product oriented research for establishing self-sustaining creative centres in ECE to serve the societal needs.

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Program Educational Objectives (PEOs)

M.Tech -Wireless and Mobile Communications

- **PEO1:** Graduates will attain successful professional career by applying their Engineering skills in Wireless and Mobile Communication Systems to the challenges in industry, academia or in the pursuit of other fields.
- **PEO2:** Graduates will engage in life-long learning, adapt to evolving technology, work in multidisciplinary research to design innovative products and provide solutions and become entrepreneurs.
- **PEO3:** Graduates will practice environmental friendly research and development, professional ethics, communicate effectively, emerge as leaders in chosen fields and be socially responsible.
- **PEO4:** Continue the personal development through professional study and self learning.

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Program Outcomes (POs)

M.Tech -Wireless and Mobile Communications:

Upon Successful completion, students will have the knowledge and skills to:

- **PO1:** Identify, formulate and solve wireless communication problems in real world.
- **PO2:** Use the techniques and skills, to design and analyze wireless communication system.
- **PO3:** Apply knowledge of wireless communication system for product development using appropriate management techniques with optimum expenditure.
- **PO4:** Analyze the impact of wireless communication system design engineering solutions on the society and will be aware of contemporary issues.
- **PO5:** Determine the type and appropriate model of wireless fading channel based on the system parameters and the property of the wireless medium.

Program Specific Outcomes (PSOs)

M.Tech -Wireless and Mobile Communications:

- **PSO1**: To apply advanced data communicating methods and networking protocols for wireless and mobile environments
- **PSO2:** To utilize and employ application frameworks for developing mobile applications including under disconnected and weakly connected environment
- **PSO3**: Be able to embrace lifelong learning to meet ever changing developments in Wireless & Mobile Communications.

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Course Outcomes for M.Tech – WMC R18 for the academic year 2018-19 onwards

Course Outcome	**Year/Semester I/I Sem**	**Subject Name (Subject Code)** ADVANCED DATA COMMUNICATIONS (M18WM01)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Demonstrate the Layered Architecture of Computer Networks.		
2	Apply all the error correction and detection mechanisms.		
3	Explain various switching and Multiplexing techniques.		
4	Implement the MAC mechanisms for data sharing to network among several computers and understand the effectiveness of spread spectrum communication.		
5	Implement the various Internet Protocol addressing techniques of network layers and Understand Routing Algorithms , Uni-cast Routing Protocols in network layers.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** CODING THEORY AND TECHNIQUES (M18WM02)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Understand and apply the error detection and correction capability of Linear Block Codes		
2	Understand the algebraic structure of Cyclic Codes and implement it		
3	Able to demonstrate the practical implementation of Convolution Codes		
4	Understand the encoding and decoding of Turbo Codes for both the Serial and Parallel concatenation.		
5	Understand the various Space-Time Codes detection techniques of Spatial Multiplexing. to improve the reliability of data transmission		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** SPREAD SPECTRUM COMMUNICATION (M18WM03) (Program Elective-I)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Analyze the Fundamental Concepts of Spread Spectrum Systems.		
2	Understand the various Code Tracking Loops for synchronization between the transmitter and receiver.		
3	Design an Optimum Synchronizer for initial synchronization of the received spreading code		
4	Understand the operational principle of Multi-User Detection in CDMA Cellular Radio		
5	Analyze the Performance of Spread Spectrum communication in Jamming Environments and Forward Error Correction		

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Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** DETECTION & ESTIMATION THEORY (M18WM04) (Program Elective-I)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1.	Explain the concepts of Markov Sequences , Gaussian Processes.		
2.	Outline the fundamental concepts of probability errors and error classifiers.		
3.	Analyze the Linear and nonlinear Minimum Mean Squared Error Estimators using Digital Wiener Filters, Kalman Filters.		
4.	Measure statistical data such as Distribution of Estimators, Tests of Hypotheses, Simple and Multiple Linear Regression.		
5.	Estimate the parameters of random processes from data.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** STOCHASTIC PROCESS & TIME DOMAIN ANALYSIS (M18WM05) (Program Elective-I)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1.	Formulate various random processes like Chebyshev Inequalities, Chi-square tests of hypotheses concerning distribution.		
2.	Analyze random processes in time domain.		
3.	Relate the input and output for spectral density of random processes in frequency domain.		
4.	Classify various Markov chains and explains transition diagram.		
5.	Assess Queuing System, Delay Distribution, Mean Delay for M/M/I and M/G/I systems.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** VOICE OVER INTERNET PROTOCOL (M18WM06) (Program Elective-II)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Classify Transmission Control Protocol, UDP,RTP.		
2	Explain the architecture of H.323 Architecture, H.245 Standards,MPLS.		
3	Outline the usage of SDP With SIP.		
4	Assess the overview of QOS solutions ,Multi-protocol Label Switching and Routing.		
5	Compare M3UA and M2UA Operations and Describe the functioning of Interworking Soft switch and SS7.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** INTERNETWORKING (M18WM07) (Program Elective-II)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Explain local area networks (LANs), wide area networks (WANs) ,Internet and		

	distinguish ARP and RARP		
2	Learn Function of Forwarding, Routing of IP Packets, Transmission Control Protocol services and features of SCTP .		
3	Compare Uni-cast and Multicast- Broadcast routing.		
4	Explain the concepts of DNS,TELNET, FTP and HTTP architecture.		
5.	Assess knowledge about internet and importance of Multimedia.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** GPS AND APPLICATIONS (M18WM08) (Program Elective-II)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Measure velocity and position using GPS receiver.		
2	Explain the concept of GPS satellite position and signal structure.		
3	Distinguish GPS and GALILEO satellite construction.		
4	Categorize Geo orbit, GEO uplink and downlink systems and Compare LADGPS and WADGPS		
5	Illustrate the operation of Global positioning system and its applications.		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** ENGLISH FOR RESEARCH PAPERWRITING (M18AC01)	**L: 3 T: 0 P: 0 C: 0**
After the completion of this course, the students should be able to			
1	Understand the nuances of language and vocabulary in writing a Research Paper		
2	Develop the content, structure and format of writing a research paper		
3	Analyze and practice writing a Research Paper		
4	Enable the students to plan for original research papers without subjected to plagiarism		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** Research Methodology (M18MCO1)	**L: 3 T: 0 P: 0 C: 2**
After the completion of this course, the students should be able to			
1	Develop an understanding of IPR/ research methodology in the process of creation of patents through research		
2	Develop further research capabilities		
3	Design Important Concepts Related to Research Design		
4	Learn better report writing skills and Patenting		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** ADVANCED COMMUNICATION LABORATORY (M18WM09)	**L: 0 T: 0 P: 4 C: 2**
After the completion of this course, the students should be able to			
1	Design the physical layer in a communication system.		

2	Demonstrate various modulation and demodulation techniques.		
3	Analyze To select coding technique for efficient transmission and reception and to provide required security.		
4	To simplify the communication system for a given requirement		
Course Outcome	**Year / semester I/I Sem**	**Subject Name (Subject Code)** ADVANCED DATA COMMUNICATION AND NETWORK LABORATORY (M18WM10)	**L: 0 T: 0 P: 4 C: 2**
After the completion of this course, the students should be able to			
1	To analyze practical working knowledge of Wireless Communication Simulation and Analysis using Mathematical computing languages such as MATLAB.		
2	To Solve and Analyze Communication Channels, Circuits and Applications by writing Mathematical Equations and Programs.		
3	To Demonstrate various codes like hamming code.		
4	To develop hands on working experience with reference to simulating wireless networks using MATLAB environment		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** ADVANCED DIGITAL SIGNAL PROCESSING (M18WM11)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Recall basic concepts of DFT, FFT, IIR and FIR filters.		
2	Explain Multi Rate signal processing and their applications..		
3	Distinguish the non-parametric methods of power spectral estimation using Bartlett, Welch & Blackman-Tukey methods.		
4	Estimate the Forward prediction error, Backward prediction error.		
5	Compare auto correlation & model parameters		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** WIRELESS COMMUNICATIONS (M18WM12)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1.	Explain basic concepts of the cellular concept and Assess practical handoff considerations, interference and system capacity.		
2.	Compare mobile radio propagation with large-scale path loss.		
3.	Demonstrate types of Small-Scale Fading.		
4.	Analyze the fundamentals of Equalization and diversity in a communication Receiver.		
5	Distinguish the advantages and disadvantages of Wireless Local Area Networks		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** ADVANCED COMMUNICATIONS AND NETWORKS (M18WM13) (Program Elective-III)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			

1	Recall the basic concepts of Packet Switched Networks using OSI and IP models.		
2	Study Function of ISDN and Broadband ISDN architecture and Protocols		
3	Explain the main features, addressing, signaling and routing of ATM.		
4	Understand the concepts of Multi Protocol Label Switching (MPLS) and integrated services in the Internet.		
5	Assess Blue Tooth Technology.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** EMBEDDED SYSTEMS DESIGN (M18WM14) (Program Elective-III)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Explain the Characteristics and Quality Attributes of Embedded Systems.		
2	Discuss core of embedded system and memory and compare ROM, RAM, Memory according to the type of Interface		
3	Develop Embedded Firmware Design Approaches.		
4	Assess RTOS architecture and its applications.		
5	Classify Shared Memory, Message Passing, Remote Procedure Call and Sockets in TASK communication.		
6	Distinguish multitasking and multiprocessing task.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** OPTICAL COMMUNICATIONS TECHNOLOGY (M18WM15) (Program Elective-III)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Explain the basic concept of the Geometrical Optics approach.		
2	Classify the Fiber Optic Components for communication and networking.		
3	Distinguish Modulation and Demodulation and Estimate the Reed- Solomon Codes for Error Detection and Correction.		
4	Understand the basic concept of transmission system model .		
5	Analyze Fibre Non-linearities and system Design considerations.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** WIRELESS MIMO COMMUNICATIONS (M18WM16) (Program Elective-IV)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1.	Understand the fading channel and diversity techniques.		
2.	Compare the Constrained signaling for MIMO channels.		
3.	Develop Representation of space-time trellis codes for PSK constellation		
4.	Analyze the concatenated codes & iterative decoding		
5.	Develop Representation of space-time block codes		
Course Outcome	**Year / semester**	**Subject Name (Subject Code)** WIRELESS LANS AND PANS (M18WM17) (Program Elective-IV)	**L: 3 T: 0 P: 0 C: 3**

	I/II Sem		
After the completion of this course, the students should be able to			
1	Recall an Introduction from 1G to 4G Wireless systems and The Wireless Spectrum and understand ALOHA and CSMA/CD ,CSMA/CA.		
2	Explain the importance of Wireless LANs and Compare wired and Wireless LANs		
3	Demonstrate Network Architecture using Physical layer and The Medium Access Control Layer.		
4	Assess the importance of Wireless PANs and The Bluetooth technology		
5	Understand the concepts of IEEE 802.15 standards.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** SOFTWARE DEFINED RADIO (M18WM18) (Program Elective-IV)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Explain basic design principles of software radio and RF implementation issues such as RF Front – End and Dynamic Range.		
2	Understand the concepts of Profile and Radio Resource Management		
3	Demonstrate Radio Resource Management in Heterogeneous Networks		
4	Describe the importance of Base Stations and Mobile Terminals in networks		
5	Analyze Object – Oriented Representation of Radios and Network Resources		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** STRESS MANAGEMENT (M18AC02)	**L: 2 T: 0 P: 0 C: 0**
After the completion of this course, the students should be able to			
1	Enhance the Physical strength and flexibility.		
2	Learn to relax and focus.		
3	Relieve physical and mental tension		
4	Improve work performance/ efficiency.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** FORMATTING AND ANALYSIS LABORATORY (M18WM19)	**L: 0 T: 0 P: 4 C: 2**
After the completion of this course, the students should be able to			
1.	Explain basic concepts of LaTeX and its related components		
2.	Classify various templates acquired from the course to format documents, presentations and reports.		
3.	Compose hands on working experience with math type equation		
4.	Demonstrate understanding of sufficient familiarity with gnu plot to plot simple 2D/3D graphs of data generated by other programs.		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** SIMULATION LABORATORY (M18WM20)	**L: 0 T: 0 P: 4 C: 2**
After the completion of this course, the students should be able to			

1	Demonstrate the understanding of SCILAB		
2	Explain communications and networking to innovatively solve the problems of changing world using modern engineering tools.		
3	Build syntax, semantics, data-types and library functions of numerical computing languages such as SCILAB		
4	Visualize basic mathematical functions relevant to electronics applications		
Course Outcome	**Year / semester I/II Sem**	**Subject Name (Subject Code)** Mini Project (M18WM21)	**L: 1 T: 0 P:30 C: 2**
1	Demonstrate a sound technical knowledge of their selected project topic.		
2	Identify and summarize an appropriate list of literature review, analyze previous researchers' work and relate them to current project.		
3	Present the project outlining the approach and expected results using good oral and written presentation skills.		
4	Apply critical and creative thinking in the design of engineering projects not only limited to electronics and communication engineering domain but if possible to other interdisciplinary domains as well.		
5	Design and develop a functional product prototype while working in a team		
6	Communicate with engineers and the community at large in written and oral forms.		
7	Consider the business context and commercial positioning of designed devices or systems		
Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code)** 4G & 5G TECHNOLOGIES (M18WM22) (Program Elective-V)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Identify the generation wise development in the mobile cellular systems		
2	Analyze the Architecture and protocol of 3G networks for HSPA		
3	Understand the designing challenges and Multi carrier modulation in 4G LTE systems.		
4	Develop primary concept of WiMAX networks		
5	Evaluate the importance of cognitive radio for spectrum management.		
Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code)** MOBILE COMPUTING TECHNOLOGIES (M18WM23) (Program Elective-V)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Analyze the basic function of Mobile Computing Architecture .		
2	Illustrate and compare the operation of various cellular technologies		
3	Understand the Wireless LAN Architecture and Wireless Application Protocol		
4	Explain the overview of the hardware structure for Client Programming .		
5	Analyze the challenges of designing an Internet Protocol for voice communication		

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Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code)** ADHOC AND WIRELESS SENSOR NETWORKS (M18WM24) (Program Elective-V)	**L: 3 T: 0 P: 4 C: 3**
After the completion of this course, the students should be able to			
1	Explain the concepts of network architectures and applications of Ad Hoc wireless sensor networks		
2	Understand the application of different types of MAC and Ad Hoc		
3	Explain the challenges of routing protocols		
4	Evaluate the QoS related performance measurements of Ad hoc and sensor networks		
5	Analyze the protocol design issues of wireless sensor networks		
Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code)** ADVANCED OPTIMIZATIO N TECHNIQUES (M18MA01) (Open Elective)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1.	Apply different types of optimization techniques for different purposes.		
2.	Formulate and solve the problems by using one dimensional unconstrained minimization methods.		
3.	Formulate and solve the problems (industrial/research) by using the geometric programming.		
4.	Formulate and solve the constrained minimization methods.		
5.	Understand the importance of integer programming and solve stochastic programming		
Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code)** WASTE MANAGEMENT (M18CE27) (Open Elective)	**L: 3 T: 0 P: 0 C: 3**
After the completion of this course, the students should be able to			
1	Acquire the knowledge of waste management		
2	Explain solid waste disposal techniques		
3	Acquire the knowledge of Bio medical waste disposal techniques		
4	Acquire the knowledge of e- waste disposal techniques		
5	Select the appropriate method for solid waste collection, transportation, redistribution and disposal		
Course Outcome	**Year / semester II/I Sem**	**Subject Name (Subject Code)** Dissertation Phase-I (M18WM25)	**L: 0 T: 0 P:20 C:10**
1	Demonstrate a sound technical knowledge of their selected project topic.		

2	Identify and summarize an appropriate list of literature review, analyze previous researchers' work and relate them to current project.		
3	Formulate clearly a work plan and procedures.		
4	Present the project outlining the approach and expected results using good oral and written presentation skills.		
5	Undertake problem identification, formulation and solution.		
Course Outcome	**Year / semester II/II Sem**	**Subject Name (Subject Code)** Dissertation Phase-II (M18WM26)	**L: 0 T: 0 P:32 C:16**
	After the completion of this course, the students should be able to		
1	Apply critical and creative thinking in the design of engineering projects not only limited to electronics and communication engineering domain but if possible to other interdisciplinary domains as well.		
2	Demonstrate the knowledge, skills and attitudes of a professional engineer when working in a team		
3	Design and develop a functional product prototype while working in a team		
4	Communicate with engineers and the community at large in written and oral forms.		
5	Consider the business context and commercial positioning of designed devices or systems		