Vision of the Institution

To ignite the minds of the students through academic excellence so as to bring about social transformation and prosperity.

Mission of the Institution

- To expand the frontiers of knowledge through Quality Education.
- To provide valued added Research and Development.
- To embody a spirit of excellence in Teaching, Creativity, Scholarship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional Behavior.

Vision of ECE Department

In pursuit of world class excellence in the field of Electronics& Communication Engineering by imparting quality education and promoting Research.

Mission of ECE Department

- To empower students with knowledge and competencies in the field of Electronics & Communication Engineering conforming to International standards.
- To produce creative solutions essential to local and global needs in the field of Electronics & Communication Engineering.
- To mould the students professionally with a consciousness of moral values and professional ethical code**.**

Program Educational Objectives (PEOs) of ECE Department

PEO1: To provide world class Education in the principles of engineering that incorporate open ended design experience and the use of software and hardware tools related to Electronics and Communication Engineering and hence improve the employability skills of the student.

PEO2: To make the students able to function with multi-disciplinary teams that will enhance the leadership qualities and to formulate and solve engineering problems as a team which helps the student to adopt better professional conduct.

PEO3: To provide learning environment that provides open interaction for the students with faculty and staff that makes them innovative and dynamic and encourages research and motivate them to solve the problems of the society.

Program Outcomes (POs) of ECE Department

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs) of ECE Department

1. Will be equipped with knowledge of innovative, dynamic complete design flow specialized in implementation of projects pertaining to communication system, signal processing, digital and analog IC design, embedded systems and will integrate all areas to illustrate the goal of digital India.
2. Will have the ability to analyze, design electronics and communication applications using software tools like, pSpice, XYLINX, MATLAB, Mentor Graphics and other related software's.
3. Can demonstrate the principles of semiconductor devices, digital system, Microprocessor and microcontrollers, signal processing, antenna design in fields of consumer electronics, medical, defence and spacecraft electronics industry.
4. Will have strong ethical moral values and sound fundamental foundation of technical knowledge in all core subjects which help them to explore scientific theories, ideas, methods and technologies that help in solving current and future universal societal problems through Assistive Technology Laboratory as a flat form.

VISHNU INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

(Approved by AICTE, New Delhi Permanently Affiliated to JNTUK, Kakinada, Accredited by NBA and NAAC),
Vishnupur, Bhimavaram-534202, Andhra Pradesh, India

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE
For
MASTER OF TECHNOLOGY
in
DIGITAL ELECTRONICS AND COMMUNICATION SYSTEMS

(Applicable for batches admitted from 2019-2020)

VISHNU INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

I SEMESTER						
S. No	**Course Name**	**L**	**P**	**C**	**I**	**E**
1.	**Core I:** Digital System Design	3	-	3	40	60
2.	**Core II:** Detection & Estimation Theory	3	-	3	40	60
3.	**Program Specific Elective I**					
	Advanced Digital Signal Processing	3	-	3	40	60
	Optical Communication Technology					
	Transform Techniques					
4.	**Program Specific Elective II**					
	Digital Data Communications	3	-	3	40	60
	Statistical Signal Processing					
	Internet of Things					
5.	Lab1: System Design and Data Communications Lab	-	4	2	40	60
6.	Lab2: Advanced Digital Signal Processing Lab	-	4	2	40	60
7.	Research Methodology	2	-	2	50	-
8.	**Audit Course I**	2	-	-	-	-
	English for Research Paper Writing					
	Total	**16**	**8**	**18**	**290**	**360**
					650	

II SEMESTER						
S. No	**Course Name**	**L**	**P**	**C**	**I**	**E**
1.	**Core III:** Wireless Communications	3	-	3	40	60
2.	**Core IV:** Coding Theory & Applications	3	-	3	40	60
3.	**Programme Specific Elective III**					
	Radar Signal Processing	3	-	3	40	60
	Spread- Spectrum Techniques					
	Soft Computing Techniques					
4.	**Programme Specific Elective IV**					
	Image and Video Processing	3	-	3	40	60
	VLSI Technology & Design					
	Embedded System Design					
5.	Lab1: Advanced Communications Lab	-	4	2	40	60
6.	Lab2:Advanced Image Processing Lab	-	4	2	40	60
7.	Mini Project	-	4	2	50	-
8.	**Audit Course II**	2	-	-	-	-
	Pedagogy Studies					
	Total	**14**	**12**	**18**	**290**	**360**
					650	

III SEMESTER						
S. No	**Course Name**	**L**	**P**	**C**	**I**	**E**
1.	**Program Specific Elective V**					
	DSP Processors and Architectures	3	-	3	40	60
	EMI / EMC					
	CMOS Analog & Digital IC Design					
2.	**Open Elective**					
	Reliability Engineering	3	-	3	40	60
	MEMS and its Applications					
	Real Time Operating Systems					
3.	Dissertation Phase – I	-	20	10	-	-
	Total	**`6**	**20**	**16**	**80**	**120**
					200	

IV SEMESTER						
S. No	**Course Name**	**L**	**P**	**C**	**I**	**E**
1.	Dissertation Phase – II	-	32	16	-	**Grade**
	Total	**-**	**32**	**16**	**-**	**Grade**

I **I SEMESTER**

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

R19 M.Tech.(DECS) SYLLABUS

Course Name	DIGITAL SYSTEM DESIGN			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	3	-	3

UNIT-I: Minimization Procedures

Minimization of switching functions using k-map, tabular methods or QM algorithm. Introduction to cube based algorithms, Determination of selected cubes are wholly within the given switching function or not.

UNIT-II: CAMP Algorithm

CAMP-I algorithm, Phase-I: Determination of Adjacencies, DA, CSC, SSMs and EPCs, CAMP-algorithm, Phase-II: Passport checking, Determination of SPC. CAMP-II algorithm: Determination of solution cube, Cube based operations,

UNIT -III: PLA Design, Minimization and Folding Algorithms

Introduction and Block diagram of PLA, size of PLA, PLA design aspects, PLA minimization algorithm (IISc algorithm), PLA folding algorithm (COMPACT algorithm) with suitable examples.

UNIT-IV: Fault Diagnosis in Combinational Circuits

Faults classes and models, fault diagnosis and testing, fault detection test, test generation, testing process, obtaining a minimal complete test set, circuit under test methods - Path sensitization method, Boolean difference method, Kohavi algorithm, faults in PLAs.

UNIT-V: Fault Diagnosis in Sequential Circuits

Fault detection and location in sequential circuits, circuit test approach, initial state identification, Haming experiments, synchronizing experiments, machine identification, distinguishing experiment, adaptive distinguishing experiments.

TEXT BOOKS:

1. Logic Design Theory-N. N. Biswas, PHI
2. Switching and Finite Automata Theory-Z. Kohavi , 2nd Edition, 2001, TMH
3. Digital system Design using PLDs - Lala

REFERENCE BOOKS:

1. Fundamentals of Logic Design – Charles H. Roth, 5th Ed., Cengage Learning.
2. Digital Systems Testing and Testable Design – Miron Abramovici, Melvin A. Breuer and Arthur D. Friedman- John Wiley & Sons Inc.

Course Name	DETECTION AND ESTIMATION THEORY			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	3	-	3

UNIT –I: Random Processes

Discrete Linear Models, Markov Sequences and Processes, Point Processes, and Gaussian Processes.

UNIT –II: Detection Theory

Basic Detection Problem, Maximum A posteriori Decision Rule, Minimum Probability of Error Classifier, Bayes Decision Rule, Neyman-Pearson Classifier, General Calculation of Probability of Error, Detection with Multiple observation and unknown parameters.

UNIT –III: Linear Minimum Mean-Square Error Filtering

Linear Minimum Mean Squared Error Estimators, Nonlinear Minimum Mean Squared Error Estimators, Kalman Filters, Wiener Filters.

UNIT –IV: Statistics-I

Measurements, Nonparametric Estimators of Probability Distribution and Density Functions, Point Estimators of Parameters, Measures of the Quality of Estimators, Tests of Hypotheses, Simple Linear Regression, Multiple Linear Regression.

UNIT –V: Statistics-II

Distribution of Estimators – Binomial distribution, Poisson Distribution, Normal Distribution, Students t-distribution, Chi-square distribution, Goodness of fit test

TEXT BOOKS:

1. Random Signals: Detection, Estimation and Data Analysis - K. Sam Shanmugan & A.M. Breipohl, Wiley India Pvt. Ltd, 2011.
2. Random Processes: Filtering, Estimation and Detection - Lonnie C. Ludeman, Wiley India Pvt. Ltd., 2010.
3. Probability and Statistics for Engineers and Scientists - Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying E. Ye, Pearson, 9th Edition, 2012

REFERENCE BOOKS:

1. Fundamentals of Statistical Signal Processing: Volume I Estimation Theory– Steven. M. Kay, Prentice Hall, USA, 1998.
2. Fundamentals of Statistical Signal Processing: Volume I Detection Theory– Steven.M. Kay, Prentice Hall, USA, 1998.
3. Introduction to Statistical Signal Processing with Applications - Srinath, Rajasekaran, Viswanathan, 2003, PHI.
4. Statistical Signal Processing: Detection, Estimation and Time Series Analysis – Louis L. Scharf, 1991, Addison Wesley.

5. Detection, Estimation and Modulation Theory: Part – I – Harry L. Van Trees, 2001, John Wiley & Sons, USA.
6. Signal Processing: Discrete Spectral Analysis – Detection & Estimation – Mischa Schwartz, Leonard Shaw, 1975, Mc Graw Hill.

Course Name	ADVANCED DIGITAL SIGNAL PROCESSING (Program Elective I)			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	3	-	3

UNIT –I: Digital Filters

Introduction to DFT, FFT, IIR Filters and FIR Filters with applications.

UNIT –II: Multi Rate Signal Processing

Introduction, Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D, Multistage Implementation of Sampling Rate Conversion, Filter design & Implementation for sampling rate conversion.

UNIT –III: Applications of Multi Rate Signal Processing

Design of Phase Shifters, Interfacing of Digital Systems with Different Sampling Rates, Implementation of Narrow Band Low Pass Filters, Implementation of Digital Filter Banks, Sub-band Coding of Speech Signals, Quadrature Mirror Filters, Trans-multiplexers, Over Sampling A/D and D/A Conversion.

UNIT -IV: Non-Parametric Methods of Power Spectral Estimation

Estimation of spectra from finite duration observation of signals, Non-parametric Methods: Bartlett, Welch & Blackman-Tukey methods, Comparison of all Non-Parametric methods

UNIT –V: Implementation of Digital Filters

Introduction to filter structures (IIR & FIR), Frequency sampling structures of FIR, Lattice structures, Forward prediction error, Back ward prediction error, Reflection coefficients for lattice realization, Implementation of lattice structures for IIR filters, Advantages of lattice structures.

TEXT BOOKS:

1. Digital Signal Processing: Principles, Algorithms & Applications - J.G.Proakis & D. G. Manolakis, 4th Ed., PHI.
2. Discrete Time Signal Processing - Alan V Oppenheim & R. W Schaffer, PHI.
3. DSP – A Practical Approach – Emmanuel C. Ifeacher, Barrie. W. Jervis, 2 Ed., Pearson Education.

REFERENCE BOOKS:

1. Modern Spectral Estimation: Theory & Application – S. M .Kay, 1988, PHI.
2. Multi Rate Systems and Filter Banks – P.P.Vaidyanathan – Pearson Education.
3. Digital Signal Processing – S.Salivahanan, A.Vallavaraj, C.Gnanapriya, 2000,TMH
4. Digital Spectral Analysis – Jr. Marple

Course Name	OPTICAL COMMUNICATIONS TECHNOLOGY (Program Elective I)			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	3	-	3

UNIT –I: Signal propagation in Optical Fibers

Geometrical Optics approach and Wave Theory approach, Loss and Bandwidth, Chromatic Dispersion, Non Linear effects- Stimulated Brillouin and Stimulated Raman Scattering, Propagation in a Non-Linear Medium.

UNIT –II: Fiber Optic Components for Communication

Couplers, Isolators and Circulators, Multiplexers, Bragg Gratings, Fabry-Perot Filters, Mach Zender Interferometers, Arrayed Waveguide Grating, Tunable Filters, High Channel Count Multiplexer Architectures, Optical Amplifiers, Direct and External Modulation Transmitters, Pump Sources for Amplifiers, Optical Switches and Wavelength Converters.

UNIT –III: Modulation and Demodulation

Signal formats for Modulation, Subcarrier Modulation and Multiplexing, Optical Modulations – Duobinary, Single Side Band and Multilevel Schemes, Ideal and Practical receivers for Demodulation.

UNIT -IV: Transmission System Engineering

System Model, Power Penalty in Transmitter and Receiver, Optical Amplifiers, Crosstalk and Reduction of Crosstalk, Cascaded Filters, Dispersion Limitations and Compensation Techniques.

UNIT –V: Fiber Non-linearities and System Design Considerations

Limitation in High Speed and WDM Systems due to Non-linearities in Fibers, Wavelength Stabilization against Temperature Variations, Overall System Design considerations – Fiber Dispersion, Modulation, Non-Linear Effects, Wavelengths, All Optical Networks.

TEXT BOOKS:

1. Optical Networks: A Practical Perspective - Rajiv Ramaswami and Kumar N.Sivarajan, 2nd Ed., 2004, Elsevier Morgan Kaufmann Publishers (An Imprint of Elsevier).
2. Optical Fiber Communications – Gerd Keiser, 3rdEd., 2000, McGraw Hill.

REFERENCE BOOKS:

1.Optical Fiber Communications: Principles and Practice – John.M.Senior, 2nd Ed., 2000, PE.
2.Fiber Optics Communication – Harold Kolimbris, 2nd Ed., 2004, PEI
3.Optical Networks: Third Generation Transport Systems – Uyless Black, 2nd Ed., 2009, PEI
4.Optical Fiber Communications – Govind Agarwal, 2nd Ed., 2004, TMH.
5.Optical Fiber Communications and Its Applications – S.C.Gupta, 2004, PHI.

Course Name	TRANSFORM TECHNIQUES (Program Elective I)			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	3	-	3

UNIT -I: Fourier Analysis

Fourier series, Examples, Fourier Transform, Properties of Fourier Transform, Examples of Fourier transform, sampling theorem, Partial sum and Gibbs phenomenon, Fourier analysis of Discrete time Signals, Discrete Fourier Transform.

UNIT –II: Time – Frequency Analysis

Window function, Short Time Fourier Transform, Discrete Short Time Fourier Transform, Continuous wavelet transform, Discrete wavelet transform, wavelet series, Interpretations of the Time-Frequency plot.

UNIT -III: Transforms

Walsh, Hadamard, Haar and Slant Transforms, DCT, DST, KLT, Singular value Decomposition – definition, properties and applications

UNIT -IV: Continuous Wavelet Transform (CWT)

Short comings of STFT, Need for wavelets, Wavelet Basis- Concept of Scale and its relation with frequency, Continuous time wavelet Transform Equation- Series Expansion using Wavelets- CWT- Tiling of time scale plane for CWT. Important Wavelets: Haar, Mexican Hat, Meyer, Shannon, Daubechies.

UNIT -V: Multi Rate Analysis and DWT

Need for Scaling function – Multi Resolution Analysis, Two-Channel Filter Banks, Perfect Reconstruction Condition, Relationship between Filter Banks and Wavelet Basis, DWT, Structure of DWT Filter Banks, Daubechies Wavelet Function, Applications of DWT.

TEXT BOOKS:

1. A Wavelet Tour of Signal Processing theory and applications -RaghuveerM.Rao and Ajit S. Bopardikar, Pearson Edu, Asia, New Delhi, 2003.
2. K.P.Soman and K.I Ramachandran, " Insight into Wavelets – from theory to practice" PHI, Second edition,2008

REFERENCE BOOKS:

1. Fundamentals of Wavelets- Theory, Algorithms and Applications -Jaideva C Goswami, Andrew K Chan, John Wiley & Sons, Inc, Singapore, 1999.
2. Jaideva C. Goswami and Andrew K.Chan, " Fundamentals of Wavelets" Wiley publishers, 2006
3. A Wavelet Tour of Signal Processing-Stephen G. Mallat, Academic Press, 2 Ed
4. Digital Image Processing – S.Jayaraman, S.Esakkirajan, T.Veera Kumar – TMH,2009

Course Name	DIGITAL DATA COMMUNICATIONS (Program Elective II)			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	3	-	3

UNIT -I: Digital Modulation Schemes

BPSK, QPSK, 8PSK, 16PSK, 8QAM, 16QAM, DPSK – Methods, Band Width Efficiency, Carrier Recovery, Clock Recovery.

UNIT -II: Basic Concepts of Data Communications and Interfaces

Data Communication Networks, Protocols and Standards, UART, USB, Line Configuration, Topology, Transmission Modes, Digital Data Transmission, DTE-DCE interface.

UNIT -III: Data Link Control and Data Link Protocols

Line Discipline, Flow Control, Error Control. Asynchronous Protocols, Synchronous Protocols, Character Oriented Protocols, Bit-Oriented Protocol, and Link Access Procedures.

UNIT -IV: Local Area Networks, Metropolitan Area Networks, Switching, and Networking and Interfacing Devices

Ethernet, Other Ether Networks, Token Bus, Token Ring, FDDI.IEEE 802.6, SMDS. Circuit Switching, Packet Switching, Message Switching. Repeaters, Bridges, Routers, Gateway, Other Devices.

UNIT -V: Multiple Access Techniques

Frequency- Division Multiple Access (FDMA), Time - Division Multiple Access (TDMA), Code - Division Multiple Access (CDMA), OFDM and OFDMA. Random Access, Aloha- Carrier Sense Multiple Access (CSMA) - Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA), Controlled Access- Reservation- Polling- Token Passing, Channelization.

TEXT BOOKS:

1. Data Communication and Computer Networking - B. A.Forouzan, 2nd Ed., 2003, TMH.
2. Advanced Electronic Communication Systems - W. Tomasi, 5th Ed., 2008, PEI.

REFERENCE BOOKS:

1. Data Communications and Computer Networks - Prakash C. Gupta, 2006, PHI.
2. Data and Computer Communications - William Stallings, 8th Ed., 2007, PHI.
3. Data Communication and Tele Processing Systems -T. Housely, 2nd Ed, 2008, BSP.
4. Data Communications and Computer Networks- Brijendra Singh, 2nd Ed., 2005, PHI.

Course Name	STATISTICAL SIGNAL PROCESSING (Program Elective II)			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	3	-	3

UNIT I: Signal models and characterization

Types and properties of statistical models for signals and how they relate to signal processing, Common second-order methods of characterizing signals including auto correlation, partial correlation, cross-correlation, power spectral density and cross-power spectral density.

UNIT II: Spectral estimation

Nonparametric methods for estimation of power spectral density, autocorrelation, cross-correlation, transfer functions, and coherence form finite signal samples.

UNIT III: Review of signal processing and Statistical parameter estimation

A review on random processes, A review on filtering random processes, Examples: Maximum like hood estimation, maximum a posterior estimation, Cramer-Rao bound.

UNIT IV: Eigen structure based frequency estimation and Spectrum estimation

Pisarenko, MUSIC, ESPRIT their application sensor array direction finding. Moving average (MA), Auto Regressive (AR), Auto Regressive Moving Average (ARMA), various non-parametric approaches.

UNIT V: Wiener filtering

The finite impulse case, causal and non-causal infinite impulse responses cases, Least mean squares adaptation, recursive least squares adaptation, Kalman filtering.

TEXT BOOKS:

1. Steven M.Kay, fundamentals of statistical signal processing: estimation Theory, Pretice-Hall, 1993.
2. Monsoon H. Hayes, Stastical digital signal processing and modeling, USA, Wiley, 1996.

REFERENCE BOOKS:

1.Dimitris G. Manolakis, Vinay K. Ingle, and Stephen M. Kogon, Statistical and adaptive signal processing, Artech House, Inc,2005.

Course Name	INTERNET OF THINGS (Program Elective II)			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	3	-	3

UNIT I

Introduction & Concepts: Introduction to Internet of Things, Physical Design of IOT, Logical Design of IOT, IOT Enabling Technologies, IOT Levels.

UNIT II

Domain Specific IOTs: Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Life Style.

UNIT III

M2M & System Management with NETCONF-YANG: M2M, Difference between IOT and M2M, SDN and NFV for IOT, Software-defined Networking, Network Function Virtualization, Need for IOT Systems Management, Simple Network Management Protocol, Limitations of SNMP, Network Operator Requirements, NETCONF, YANG, IOT Systems management with NETCONF-YANG.

UNIT IV

Developing Internet of Things & Logical Design using Python: Introduction, IOT Design Methodology, Installing Python, Python Data Types & Data Structures, Control Flow, Functions, Modules, Packages, File Handling, Date/ Time Operations, Classes, Python Packages.

UNIT V

IOT Physical Devices & Endpoints: What is an IOT Device, Exemplary Device, Board, Linux on Raspberry Pi, Interfaces, and Programming & IOT Devices.

TEXT BOOKS:

1. Vijay Madisetti, ArshdeepBahga," Internet of Things A Hands-On- Approach",2014,

REFERENCE BOOKS:

1. Adrian McEwen, "Designing the Internet of Things", Wiley Publishers, 2013
2. Daniel Kellmereit, "The Silent Intelligence: The Internet of Things". 2013.

Course Name	RESEARCH METHODOLOGY			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	2	0	2

UNIT I

Research Foundation: Motivation and objectives – Research methods, Methodology. Types of research, Defining and formulating the research problem, Hypothesis – Qualities of a good Hypothesis, Hypothesis Testing – Logic & Importance

UNIT II

Literature Review: primary and secondary sources, Effective literature studies approaches, analysis, identifying gap areas from literature and research database.

UNIT III

Data Collection And Analysis: Accepts of method validation, observation and collection of data, methods of data collection, sampling methods, data processing and analysis strategies and tools, data analysis with statically package (Sigma STAT,SPSS for student t-test, ANOVA, etc.), hypothesis testing.

UNIT IV

Research Ethics: Plagiarism, Research ethics, IPR- intellectual property rights and patent law, commercialization, copy right, royalty, trade related aspects of intellectual property rights (TRIPS); scholarly publishing- IMRAD concept and design of research paper, citation and acknowledgement, reproducibility and accountability.

UNIT V

Interpretation and Report Writing: Significance of Report Writing, Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, Mechanics of Writing a Research Report, Precautions for Writing Research Reports, Conclusions.

REFERENCES

1.Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International.
2.Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing.
3.Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
4.Stuart Melville and Wayne Goddard, 1996. Research methodology: an introduction for science

& engineering students, Kenwyn, South Africa : Juta & Co. Ltd.,
5. T. Ramappa, 2008, Intellectual Property Rights Under WTO, S. Chand.

ADDITIONAL READING

1.Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Ess Publications. 2 volumes.
2.Carlos, C.M., 2000. Intellectual property rights, the WTO and developing countries: the TRIPS agreement and policy options. Zed Books, New York.
3. Coley, S.M. and Scheinberg, C. A., 1990, "Proposal Writing", Sage Publications.
4. Day, R.A., 1992. How to Write and Publish a Scientific Paper, Cambridge University Press.
5. Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"
6. Ranjit Kumar, 2 nd Edition, "Research Methodology: A Step by Step Guide for beginners"

Course Name	ENGLISH FOR RESEARCH PAPER WRITING (Audit Course I)			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	2	0	0

UNIT I

Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness

UNIT 2

Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticising, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts. Introduction

UNIT 3

Review of the Literature, Methods, Results, Discussion, Conclusions, the Final Check.

UNIT 4

Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature.

UNIT 5

Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the conclusions.

UNIT 6

Useful phrases, how to ensure paper is as good as it could possibly be the first- time submission

REFERENCES:

1. Goldbort R (2006) Writing for Science, Yale University Press (available on Google Books)
2. Day R (2006) How to Write and Publish a Scientific Paper, Cambridge University Press
3. Highman N (1998), Handbook of Writing for the Mathematical Sciences, SIAM. Highman‟s book.
4. Adrian Wallwork, English for Writing Research Papers, Springer New York Dordrecht Heidelberg London, 2011

Course Name	SYSTEMS DESIGN AND DATA COMMUNICATIONS LAB			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	0	4	2

Part-A: Systems Design Lab

Any 6 experiments are simulated and synthesized using XILINX

List of experiments:

1. Realization of Logic Gates
2. 3 TO 8 Decoder Design
3. Multiplexer Design
4. RAM Design
5. ROM Design
6. Implementation of Bus Using Registers
7. Implementation of Bus Using Multiplexers
8. Control Unit and Data Processor Logic Design
9. Kohavi algorithm.
10. Hamming experiments.

Part-B: Data Communications Lab

Any 4 experiments are simulated using ST 5001 Software/ NS2 Software

1. Study of serial interface RS – 232
2. Study of pc to pc communication using parallel port
3. To establish pc-pc communication using LAN
4. Study of LAN using star topology, bus topology and tree topology
5. To configure a hub/switch
6. To study the interconnections of cables for data communication
7. Study of a wireless communication system

Course Name	ADVANCED DIGITAL SIGNAL PROCESSING LAB			
Semester	M. Tech / I Sem	L	P	C
Regulation Year	2019-20	0	4	2

Any 12 experiments simulated using MATLAB

List of Experiments:

1. Basic Signal Representation
2. Correlation Auto And Cross
3. Stability Using Hurwitz Routh Criteria
4. Sampling FFT of Input Sequence
5. Butterworth Low pass And High pass Filter Design
6. Chebychev Type I, II Filter
7. State Space Matrix from Differential Equation
8. Normal Equation Using Levinson Durbin
9. Decimation and Interpolation Using Rationale Factors
10. Maximally Decimated Analysis DFT Filter
11. Cascade Digital IIR Filter Realization
12. Convolution and M Fold Decimation &PSD Estimator
13. Estimation of PSD
14. Inverse Z Transform
15. Group Delay Calculation
16. Separation of T/F
17. Parallel Realization of IIR filter