



VIJAYA INSTITUTE OF TECHNOLOGY FOR WOMEN

An ISO 9001:2015 Certified Institute, Approved by AICTE, Affiliated to JNTU Kakinada, AP

Phone: 0866-2844444, Email: vijayatechfw@gmail.com Website: www.vitw.edu.in

College Code: NP, Enikepadu, Vijayawada-521108

Department of Electronics and Communication Engineering

List of Course Outcomes

Batch: 2019(R19)

Year & Sem	Subject Code	Course Code	Course Name	At The End of The Course, The Student Will Be Able To
I-I	R19HS1101	C111	Communicative English -I	CO1:Ask and answer general questions on familiar topics and introduce oneself/others
				CO2:Recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs
				CO3:To help and improve speaking skills through participation in activities such as role plays,discussions and structured talks /oral presentations
				CO4:Discuss specific topics in pairs or in groups for Functional English
				CO5:Understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information
				CO6:Form sentences using proper grammatical structures and correct word forms
I-I	R19BS1106	C112	Applied chemistry	CO1:Outline the properties of polymers and various additives added and different methods of forming plastic materials. Explain the preparation, properties and applications of some plastic materials. Interpret the mechanism of conduction in conducting polymers. Discuss natural and synthetic rubbers and their applications.
				CO2:Explain the theory of construction of battery and fuel cells and can categorize the reasons for corrosion and study some methods of corrosion control.
				CO3:Analyze the liquid crystals, superconductors and the preparation of semiconductors.
				CO4:Analyze the importance of materials like Nanomaterials and fullerenes and their uses.
				CO5:Obtain the knowledge of computational chemistry and Analyze the importance of molecular machines.
				CO6:Explain the different applications of analytical instruments and design sources of energy by different natural sources and Analyze the principles of different analytical instruments.
				CO1:Outline the basic terminology of computer programming and illustrate to write, compile & debug a C-program.
				CO2:Make use of basic C- programming language constructs to build C-programs.



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I-I	R19ES1101	C113	Computer Programming	CO3:Develop C-programs by utilizing various control structures.
				CO4:Classify modular programming techniques to implement C- programs.
				CO5:Build C-programs by using data structures like arrays, strings.
				CO6:Make use of pointers and different derived data structures to solve problems in C.
I-I	R19BS1101	C114	Mathematics -I	CO1:Utilize mean value theorems to real life problems (L3)
				CO2:Solve the differential equations of first order and their applications
				CO3:Solve the differential equations of second and higher order and applications.
				CO4:Solve the differential equations related to various engineering fields(L3)
				CO5:Familiarize with functions of several variables which is useful in optimization(L3)
				CO6:Apply double integration techniques in evaluating areas bounded by region and triple integral techniques over volume.
I-I	R19ES1103	C115	Engineering Drawing	CO1:Make use of graphic representation as per standards and to construct polygons, curves
				CO2:Construct scales and prepare the orthographic projections of points and straight lines placed in various quadrants
				CO3:Identify and draw the projection of straight lines inclined to both the planes
				CO4:Identify and draw the projection of planes inclined to both the planes
				CO5:Plan and draw the projection of solids in different positions & inclined to one of the planes
				CO6:Interpret orthographic and isometric views of objects
I-I	R19MC1101	C116	Environmental Sciences	CO1:Able to understand the fundamentals of environmental science and ecology system
				CO2:Able to Understand the fundamentals of natural resources
				CO3:Develop species and ecosystem diversity-classification - Value of biodiversity.
				CO4:Classify species and ecosystem diversity-classification - Value of biodiversity
				CO5:Build Water conservation, rain water harvesting-Resettlement and rehabilitation of people.
				CO6:Make use of Water conservation, rain water harvesting-Resettlement and rehabilitation of people



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I-II	R19BS1202	C121	Mathematics-II	CO1:Develop the use of matrix algebra techniques that is needed by engineers for practical applications and solve system of linear algebraic equations by Gauss elimination method.
				CO2:Find the inverse and powers of matrices by Cayley Hamilton theorem.
				CO3:Evaluate the approximate roots of polynomial and transcendental equations by different algorithms(L5)
				CO4:Solve system of linear algebraic equations using Gauss Jacobi ,Gauss seidel (L3)
				CO5:Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (L3)
				CO6:Apply different algorithms for approximating the solution of Ordinary differential Equations with initial conditions to its analytical computations(L3)
I-II	R19BS1203	C122	Mathematics III	CO1:Interpret the physical meaning of different operators such as gradient, curl and divergence and Estimate the work done against a field, circulation and flux using vector calculus (L5)
				CO2:Apply the Laplace transform for solving differential equations (L3)
				CO3:Find or compute the Fourier series of periodic signals (L3)
				CO4:Apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (L3)
				CO5:Identify solution methods for partial differential equations that model physical processes (L3)
				CO6:Classify and Solve the different types of partial differential equations.
I-II	R191204	C123	Applied Physics	CO1:Elucidate the need of coherence and the conditions for sustained interference. Analyse the differences between interference and diffraction with applications. Illustrate the resolving power of various optical instruments.
				CO2:Explain the fundamentals of quantum mechanics. Analyse the Physical significance of wave function. Apply Schrodinger wave equation for energy values of a free particle.
				CO3:Explain the various electron theories and calculate the Fermi energy.
				CO4:Interpret the effects of temperature on Fermi-Dirac distribution function. Summarise various types of solids based on Band Theory.
				CO5:Classify the energy bands of semiconductors. Outline the properties of n-type & p-type



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				<p>semiconductors. Identify the types of semiconductors using Hall effect.</p> <p>CO6: Explain the concepts of polarisation and summarise various types of polarisation of dielectrics. Interpret Lorentz field and Clausius-Mossotti relation in dielectrics. Classify the magnetic materials based on susceptibility and their temperature dependence. Explain the applications of dielectric and magnetic materials.</p>
I-II	R19ES1209	C124	Network Analysis	<p>CO1: Outline the working principles of Resistance parameter – series and parallel combination, Inductance parameter – series and parallel combination</p> <p>CO2: Make use of the principles of R-L circuit, R-C circuit with DC excitation, Evaluating initial conditions procedure, second order differential</p> <p>CO3: Classify and Illustrate the construction and working of various measuring instruments.</p> <p>CO4: Classify series R-L, R-C, R-L- C circuits problem solving. Complex impedance and phasor notation for R-L, R-C, R-L-CL-C</p> <p>CO5: Understand the fundamentals of Z-parameters, Y-parameters, Transmission line parameters, h-parameters, Inverse h-parameters</p> <p>CO6: Analyze the different networks, problem solving including dependent sources also.</p>
I-II	R19ES1211	C125	Basic Electronics and Electrical Engineering	<p>CO1: Outline global Principle of operation of DC generator – emf equation – types of DC machines</p> <p>CO2: Demonstrate OC & SC tests pre determination of efficiency</p> <p>CO3: Explain Principle of operation and construction of alternators</p> <p>CO4: Categorize and explain three-phase induction motors – slip ring and squirrel cage motors – slip-torque characteristics –</p> <p>CO5: Identify single phase induction motor - shaded pole motors –</p> <p>CO6: Examine and understand the concept of – capacitor motors and AC servomotor.</p>
II-I	R1921041	C211	Electronic Devices And Circuits	<p>CO1: Outline the basic concepts of semiconductor physics.</p> <p>CO2: Understand the concept of formation of a p-n junction and the construction of different diodes.</p> <p>CO3: Analyze the working of rectifiers and filters with relevant expressions.</p> <p>CO4: Understand the operation and analyze the characteristics of BJT and FET in different configurations.</p> <p>CO5: Apply proper biasing and stabilization methods to BJT and FET circuits.</p>



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				CO6:Analyze BJT and FET amplifier circuits using small signal low frequency model.
II-I	R1921042	C212	Switching Theory and Logic Design	CO1:Represent signed binary numbers using different number systems and binary codes.
				CO2:Apply Boolean algebra, K-maps and Tabular method to minimize logic functions.
				CO3:Make use of combinational circuits to implement combinational logic functions.
				CO4:Develop combinational circuits using PLD's.
				CO5:Construct sequential circuits like counters and registers using flip-flops.
				CO6:Model the minimized Finite State Machines by using state diagrams.
II-I	R1921043	C213	Signals & Systems	CO1:Characterize the signals and systems and build the analogy between vectors & signals to develop the Fourier series concepts.
				CO2:Make use of the Fourier concept to analyze the spectral characteristics for different classes of signals.
				CO3:Explain the process of sampling and reconstruction of signal.
				CO4:Outline the concepts of convolution & Correlation to examine the response of LTI systems.
				CO5:Apply the Laplace transform to analyze continuous LTI systems.
				CO6:Apply the Z- transform to analyze DT LTI systems.
II-I	R1921044	C214	Random Variables and Stochastic Process	CO1:Mathematically model the random phenomena and solve simple probabilistic problems.
				CO2:Identify different types of random variables and compute statistical averages of these random variables.
				CO3:Make use of the concepts of single random variable to study the behaviour of random phenomenon for a multi random variable case.
				CO4:Outline the Temporal characteristics of the Random processes.
				CO5:Explain the characteristics of the Random processes in spectral domain.
				CO6:Apply the concepts of random variables and processes to analyze the behaviour of LTI systems in the presence of different types of noise.
				CO1:Utilize the demand forecasting methods to predict demand of a product.
				CO2:Analyse Production function & economies of scale and assess the BEP of their own business.
				CO3:Identify the concepts of competitive market situations.



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II-I	R1921026	C215	Managerial Economics and Financial Analysis	CO4:Classify the types of business organizations and identify the stages of business cycles to improve the organizations.
				CO5:Simplify accounting concepts to prevent loss for the organization.
				CO6:Discover the sources of raising capital for business undertaking
II-II	R1922041	C221	Electronic Circuit Analysis	CO1:Compare small signal low & high frequency amplifiers using BJT and FET.
				CO2:Compare multistage amplifiers based on the combination of different amplifier configurations.
				CO3:Compare different types of feedback amplifiers
				CO4:Make use of baurkhasan criteion to design different types of oscillators.
				CO5:Apply load line concept to examine different types of power amplifiers.
				CO6:Analyze different Tuned amplifiers.
II-II	R1922042	C222	Linear Control Systems	CO1:Develop the transfer function using block diagram algebra and signal flow graph methods
				CO2:Analyze the Transient & Steady State Performance of control systems
				CO3:Analyze the stability of LTI systems using Routh's stability criterion and the Root locus method.
				CO4:Analyze the stability of LTI systems using frequency response methods.
				CO5:Design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams.
				CO6:Develop the state models to solve time invariant state equations and outline the concepts of controllability and observability of control systems.
II-II	R1922043	C223	Electromagnetic Waves and Transmission Lines	CO1:Explain and illustrate the steady Electric fields in different media.
				CO2:Summarize magnetostatic fields for static case, and apply the Maxwell equations to study the time varying behaviour of EM waves.
				CO3:Interpret the characteristics of uniform plane waves in different media.
				CO4:Illustrate the wave characteristics for normal and oblique incidence and derive the relation for the power flow mechanism.
				CO5:Classify different types of transmission lines based on primary and secondary constants.
				CO6:Derive the expressions to determine different transmission line parameters and verify the same with the smith chart.
				CO1:Explain the basic concepts of analog communication system and compare various generation, detection techniques of amplitude modulation



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II-II	R1922044	C224	Analog Communications	CO2:Compare various types of amplitude modulation techniques with spectral characteristics
				CO3:Explain different methods of generation and detection of FM
				CO4:Classify radio transmitters and receivers based on their operation
				CO5:Outline the effect of noise on analog modulation systems
				CO6:Illustrate various analog pulse modulation systems
II-II	R1922045	C225	Computer Organisation and architecture	CO1:Outline the architecture, the performance measurement of a modern computer
				CO2:Extend the knowledge of registers, instructions and addressing modes in understanding the architecture of a digital computer.
				CO3:Extend the knowledge of instructions ,addressing modes and I/O operations in understanding the architecture of a digital computer.
				CO4:Compare and Contrast different methods for computer I/O.
				CO5:Classify read only memories, cache memories, Secondary storages in hierarchical memory system.
II-II	R1922026	C226	Managerial and organisational behaviour	CO1:Appraise the practices of management concepts in the business environment and evaluate various types of organization structures.
				CO2:Identify the production management practices and distinguish the different stock levels of an organization.
				CO3:Prepare an appropriate marketing mix and determine the recruitment process in global competitive environment.
				CO4:Evaluate the project process on the basis of costs and time.
				CO5:Recognize and analyze the strategies of the firm and can re discover the SWOT of themselves.
				CO6:Understand and develop the contemporary management practices such as MIS, MRP, TQM,ERP, BPO and assess the changing business environment.
III-I	R1931041	C311	Linear IC Applications	CO1:Outline the basic operation and performance parameters of differential amplifiers.
				CO2:Demonstrate the measuring techniques for performance parameters of OP-AMP.
				CO3:Construct different linear and non-linear circuits using OP- AMPs
				CO4:Analyze and design amplifiers and active filters using OP- AMPs



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				CO5:Develop applications by making use of different analog ICs.
				CO6;Construct different types of DAC's and ADC's using OP- AMP
III-I	R1931042	C312	Microprocessor and Micro Controller	CO1:Comprehend the architecture and working of 16 bit microprocessor 8086.
				CO2:Apply assembly language programming skills to perform arithmetic, logical and string operations with 8086.
				CO3:Develop applications involving interfacing of various peripherals with 8086 microprocessor.
				CO4:Outline the architectural features of 80386 and 80486 microprocessors.
				CO5:Develop microcontroller based standalone applications for societal needs.
				CO6:Comprehend the architecture and instruction set of PIC 16F877 microcontroller.
III-I	R1931043	C313	Digital Communications	CO1:Illustrate the various types of baseband digital modulation techniques .
				CO2:Explain band pass digital modulation and demodulation techniques
				CO3:Identify the error probability of various receivers using digital modulation techniques
				CO4:Apply the information theory in determine the channel capacity
				CO5:Compare different source coding schemes for efficient data representation
				CO6:Compare different error control coding schemes for the reliable transmission of digital information over the channel
III-I	R1931044	C314	Electronic measurement and Instrumentation	CO1:Understand the different characteristics of electronic measuring instruments.
				CO2:Make use of Signal generators to analyze a signal.
				CO3:Understand the design and functioning of Oscilloscopes.
				CO4:Utilize AC bridges for measurement of inductance.
				CO5:Distinguish active transducers from passive transducers.
				CO6:Develop the ability to use instruments for measurement of physical parameters.
III-I	R193104D	C315	Soft Computing Techniques	CO1:Explain the Need of Python Programming, how a program works.
				CO2:Develop Tuples, Sets, Dictionaries, and Sequences. Comprehensions
				CO3:Identify Data hiding, polymorphism, working with instances
				CO4:Compare soft computing vs hard computing, Verilog, Timing in Sequential Circuits,



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				<p>Synchronous Operation, Asynchronous Sequential Circuits</p> <p>CO5:Analyse crossover and mutation properties</p> <p>CO6:Formulate and implement a program to solve a real-world problem using GUI and Turtle graphics.</p>
III-II	R1932041	C321	Wired and Wireless transmission devices	<p>CO1:Introduce the Microwave Spectrum and Bands, Applications of Microwaves. Rectangular Waveguides –</p> <p>CO2:Classify Radiation Patterns, Patterns in Principal Planes, Main Lobe and Side Lobes, Beam widths, Polarization</p> <p>CO3:Build Radiation from Small Electric Dipole, Quarter wave Monopole and Half wave Dipole – Current Distributions.</p> <p>CO4:Outline the Traveling wave radiators, Long wire antennas, Rectangular Patch Antennas</p> <p>CO5:Develop Space Wave Propagation–Mechanism, LOS and Radio Horizon, Tropospheric Wave Propagation –</p> <p>CO6:Design the VSWR, Impedance and Gain Measurements</p>
III-II	R1932042	C322	VLSI Design	<p>CO1:Illustrate the various fabrications steps of IC and come across basic electrical properties of MOSFET.</p> <p>CO2:Apply design rules to construct the layout of different digital circuits.</p> <p>CO3:Build MOS circuits with the help of Basic circuit concepts and analyze its characteristics based on the Scaling factors.</p> <p>CO4:Describe Chip input & output circuits and Design For Testability using different testing techniques.</p> <p>CO5:Make use of FPGA architectures to realize digital circuits.</p> <p>CO6: Design static CMOS combinational and sequential logic at the transistor level, including mask layout</p>
III-II	R1932043	C323	Digital Signal Processing	<p>CO1:Apply the concepts of difference equations to analyze the discrete time systems.</p> <p>CO2:Make use of the FFT algorithm for solving the DFT of a given signal.</p> <p>CO3:Analyze the Digital IIR filter design for different specifications and Realize its structures.</p> <p>CO4:Analyze the Digital FIR filter design for different specifications and Realize its structures.</p> <p>CO5:Understand the Multirate Processing concepts in various applications.</p>



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				CO6:Outline the architecture of programmable Digital Signal processors and apply the signal processing concepts on DSP Processor.
III-II	R1932044	C324	Internet of Things	CO1:Introduction to IoT, Architectural Overview,
				CO2:Construct ARM Cortex-A class processor
				CO3:Build Co AP, UDP, TCP, Bluetooth.
				CO4:Discover Data acquisition and integration, Device data storage-Unstructured data storage on cloud/local server
				CO5:Explain IoT case studies and mini projects based on Industrial automation
				CO6:Build the Agriculture ,Healthcare, Home Automation
III-II	R193204A	C325	Cellular mobile Communication	CO1:Outline the concepts of cellular systems and the effect of co- channel Interference reduction.
				CO2:Analyze the effects of interferences, develop antenna system.
				CO3:Outline various frequency management, channel assignment algorithms in cellular systems and illustrate various propagation effects in cellular environment.
				CO4:Illustrate different types of antennas used at cell site and mobile stations.
				CO5:Compare various types of handoff techniques and summarise the concepts of dropped calls.
				CO6:Illustrate the architecture of GSM and multiple access techniques.
III-II	R193204F	C326	Data mining	CO1:Understand the fundamental.
				CO2:Explain the basics of Data Cleaning, Data Integration, Data Reduction
				CO3:Understand the basics of General Approach to solving a classification problem
				CO4:Analyze Frequent Item Set generation
				CO5:Analyze the The Basic K-means Algorithm
				CO6:Illustrate the Different Agglomerative Hierarchical Clustering Algorithm DBSCAN
III-II	R1932047	C327	Intellectual Property Rights	CO1:Recall and relate the real property law with Intellectual property law.
				CO2:Outline the subject matters of copyright and could able to demonstrate the registration procedure and infringement consequences.
				CO3:Make use of Rights and Limitations under Patent Law and could make new inventions and developments in Patent Law.
				CO4:Understand the Trade Mark Registration Process, maintenance, Inter parties Proceedings, Infringement, Ownership of Trade Mark and Litigations.



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				CO5:Utilize maintaining Trade Secret, Physical Security, Employee Access Limitation, Employee Confidentiality Agreement of Trade Secret Law.
				CO6:Understand the concepts of the Cyber Law, Cyber Crime, E- commerce, Data Security, Confidentiality, Privacy and International aspects of Computer and Online Crime.
IV-I	R1941041	C411	Microwave & Optical Communication	CO1:Illustrate the basic principle Cavities, Re-entrant Cavities, Two Cavity Klystrons-Structure
				CO2:Classify the different types and Characteristics of Slow Wave Structures.
				CO3:Analyze the principle of Connector types, Single mode fiber connectors, Connector return losses
				CO4:Compare the Physical principles and comparison of: Optical sources and detectors
				CO5:Demonstrate the Different Blocks, Microwave Power Measurement- Bolometer Method..
				CO6:Understand the various Attenuation, Detector Characteristics.
IV-I	R1941042	C412	Digital Communication & Computer networks	CO1:Understand the concepts of Data Representation, Data Flow, Networks- Distributed Processing, Network Criteria, Physical Structures,
				CO2:Illustrate The Services Provided by the Link Layer, Types of errors, Redundancy, Detection vs Correction.
				CO3:Interpret Virtual Circuit and Datagram Networks-Virtual-Circuit Networks, Datagram Networks,
				CO4:Illustrate Multiplexing and Demultiplexing, Connectionless Transport: UDP -UDP Segment Structure
				CO5:Make use of Network Application Architectures, Processes Communicating, Transport Services
				CO6:Analyze the FTP,- FTP Commands and Replies, Electronic Mail in the Internet- STMP, Comparison with HTTP.
IV-I	R1941043	C413	Digital Image Processing & video processing	CO1:Introduction, Image sampling, Quantization, Resolution, Image file formats.
				CO2:Histogram processing, Fundamentals of Spatial filtering, smoothing spatial filters, sharpening spatial filters. Frequency domain methods.
				CO3:Interpret Region based segmentation., Classification of segmentation techniques,
				CO4:Illustrate how the Analog Video, Digital Video. Time-Varying Image Formation models
				CO5:Make use of the Mesh based Motion Estimation, Global Motion Estimation



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				CO6:Analyze the Multi resolution motion estimation, Waveform based coding
IV-I	R194104A	C414	Communication Standard Protocols	CO1:Explain the Communications, Signal Types and its characteristics (Analog/Digital), Data Transmission Types (Serial/Parallel)
				CO2:Explain the various loss and dispersion mechanisms in optical fiber. Choose the appropriate materials required to construct the optical fibers.
				CO3:Choose appropriate connectors and/or splices to join the optical fibers.
				CO4:Classify the Optical sources and detectors and to discuss their principle.
				CO5:Analyze Able to develop sensor networks Able to communicate data via Wired/Wireless communication
				CO6:Design the Bridges and its working, Network Security and Introduction to Firewall
IV-I	R194104H	C415	Embedded Systems	CO1:Classify the elements, characteristics, quality attributes and applications of typical embedded systems.
				CO2:Identify hardware components required for an embedded system and the design approach of an embedded hardware.
				CO3:Compare embedded firmware design approaches on embedded environment.
				CO4:Explain Internals of Real-Time operating system and the fundamentals of RTOS based embedded firmware design and identify the need for hardware software Co-design.
				CO5:Make use of different IDEs for firmware development of different family of processors/controllers and embedded operating systems.
				CO6:Outline the concepts of embedded system implementation and testing.
IV-I	R1941046	C416	Project part -I	Design engineering solutions for solving complex engineering problem
IV-II	R1942041	C421	Project part –II	Demonstrate the technical knowledge to identify problems in the & Communication Engineering and its allied areas. field of Electronics
IV-II	R194204A	C422	Wireless Communication	CO1:Know about the Wireless systems and Standards (1G/2G/3Gsystems)
				CO2: Understand the concepts of Multiple-Input Multiple-Output (MIMO)..
				CO3:Outline various frequency management, channel assignment algorithms in cellular systems and illustrate various propagation effects in cellular environment.
				CO4:Analysis of Multiple-Input Multiple-Output Wireless Communications:



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				CO5: Compare Satellites and Transponders, Signal and Noise Calculations, Systems
				CO6: Illustrate the architecture of GSM and multiple access techniques.
IV-II	R194204G	C423	Cyber Security & cryptography	CO1: Describe the types of computer for ensics technology
				CO2: Explain the computer forensics fundamentals, Illustrate the methods for data recovery, evidence collection and data seizure.
				CO3: Understand the Computer Forensics Software Tools
				CO4: Analyze various computer forensics systems
				CO5: Distinguish Technology and Students: Indian Scenario.
				CO6: Develop the ability to use instruments for measurement of physical parameters.