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Programme: **Bachelor of Technology** **Semester –VI**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total
BT-16101	Ethical Hacking & Cyber Security	3	1	-	(70)	(30)	Min: 40 (D Grade	(Nil)	(Nil)	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test-- Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment/ Quiz/Attendance Max. Marks: Nil

Pre-Requisite	Student should have basic knowledge of computer.
Course Outcome	1. Identify and analyze the stages an ethical hacker requires to take in order to compromise a target system.
	2. To identify tool and techniques to carry out a penetration testing.

Unit	Contents *(Theory)*	Marks Weightage
I	**Introduction**: Understanding the importance of security, Concept of ethical hacking and essential Terminologies-Threat, Attack, Vulnerabilities, Target of Evaluation, Exploit. Phases involved in hacking, **Foot Printing:** Introduction to foot printing, Understanding the information gathering methodology of the hackers, Tools used for the reconnaissance phase.	**14**
II	**System-Hacking**-Aspect of remote password-guessing Role of-eavesdropping, Various methods of password cracking, Keystroke Loggers, Understanding Sniffers, Comprehending Active and Passive Sniffing, ARP Spoofing and Redirection, DNS and IP Sniffing, HTTPS Sniffing.	**14**
III	**Hacking Wireless Networks:** Introduction to 802.1I,Role of WE?, Cracking WEP Keys, Sniffing Traffic, Wireless DOS attacks, WLAN Scanners, WLAN Sniffers, Hacking Tools, Securing Wireless Networks.	**14**
IV	**Introduction to Cybercrime:** Defining Cybercrime, Understanding the Importance of Jurisdictional Issues, Quantifying Cybercrime, Differentiating Crimes That Use the Net from Crimes That Depend on the Net, working toward a Standard Definition of Cybercrime, Categorizing Cybercrime, Developing Categories of Cybercrimes, Prioritizing Cybercrime Enforcement, Reasons for Cybercrimes.	**14**
V	**Introduction to Cybercrime:** Defining Cybercrime, Understanding the Importance of Jurisdictional Issues, Quantifying Cybercrime, Differentiating Crimes That Use the Net from Crimes That Depend on the Net, working toward a Standard Definition of Cybercrime, Categorizing Cybercrime, Developing Categories of Cybercrimes, Prioritizing Cybercrime Enforcement, Reasons for Cybercrimes.	**14**

Text Book/References Books/ Websites:

1. Aare, LuniverPress;NetworkSecurity;Ethical Hacking Rajat. 30-Nor-2006
2. Thomas Mathew ;Ethical !lacking;0571 Publisher, 28-Nor-2003

Suggested List of Laboratory Experiments :-Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External	Internal	Total
BT-16102	Human Health & Nutrition Disorder	3	1	-	(70)	(30)	Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks : 30	Best of Two Mid Semester Test-Max Marks : 20	Assignment/Quiz/Attendance – Max. Marks : 10
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks : Nil	Assignment / Quiz /Attendance – Max. Marks : Nil

Pre-Requisite	Nil
Course Outcome	1. To understand basic concepts in food and nutrition.
	2. To be able to know different types of nutrients.
	3. To know the basic food groups and methods of cooking.

Unit	Contents(Theory)	Marks weightage
I	**Basic concepts in food and nutrition:** • Basic terms used in study of food and nutrition • Understanding relationship between food nutrition and health • Functions of food-Physiological, Psychological and social	**14**
II	**Nutrients:** • Functions, dietary sources and clinical manifestation of deficiency / excess of the following nutrients: • Carbohydrates, Lipids and Proteins • Fat soluble vitamins – A,D,E and K • Water soluble vitamins- thiamin, riboflavin, niacin, pyridoxine, Foliate, vitamin B12 and vitamin C • Minerals- calcium, iron and iodine	**14**
III	**Food Groups:** • Selection, nutritional contribution and changes during cooking of the following food group: ▪ Cereals ▪ Pulses ▪ Fruits and vegetables. ▪ Milk and milk products ▪ Eggs ▪ Meat, poultry and fish ▪ Fats and oils	**14**
IV	**Methods of cooking and preventing nutrient losses:** • Dry, moist, frying and microwave cooking • Advantages disadvantages and the effect of various methods of cooking on nutrition's • Minimizing nutrient losses	**14**

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V	**Nutritional Problems and programs:** • Nutritional problems in India • National nutritional policy • National nutritional program in India.	**14**

Text Book/References Books/ Websites:

1. Swaminathan; M Hand book of foods and nutrition fifth Ed : 1986 Bappco,
2. Srilakshmi B; nutrition science 2012;New Age international (P) LTD.
3. Mudambi, SR and Rajagopal; mv fundamentals of foods Nutrition and Diet Therapy;Fifth Ed: 2012
4. Potter N.M Hotchkiss;Jh Food Sciences; Fifth ed.2006
5. Khanna K Gupta S Seth R Mahana R. Rekhi T. ;The AM an and Science of cooking
6. Suri.s and malhotra; A food science nutrition & Food safety pearson india LTD 2014.

Suggested List of Laboratory Experiments (Expandable):- Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
BT-16103	Human Resource Management	3	1	-			Min: 40 (D Grade)			Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment/ Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Nil
Course Outcome	1. The objective of the course is to equip students with various human resource management concepts and current practices in managing human resources in knowledge based environment.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction to Human Resource Management**: Definition and Concept, Features , Objectives, Functions, Scope and Development of Human Resource Management, Importance of Human Resource Management, Human Resource Planning	**14**
II	**Job Analysis and Design:** Job Analysis, Job Description, Job Specification, Job Design,Recruitment, Selection	**14**
III	**Induction programme:** Contents, Need for Induction **Training**: Concept and Significance of Training, Training Needs, Training Methods, Types of Training	**14**
IV	**Performance Appraisal**: Concept of Performance Appraisal, Purpose of performance appraisal, Process, Methods of Performance Appraisal, Major Issues in Performance Appraisal.	**14**
V	**Industrial Relation & Trade Unions:** Employee welfare, Employees Empowerment, Grievance procedure ,Collective Bargaining, Settlement of Disputes, Human Resource Accounting, Separation, Retirement Schemes, Resignation, Suspension, Layoff.	**14**

Text Book/References Books/ Websites:

1. Gupta & Joshi, 'Human Resource Management', Kalyani Publication, 2nd Edition 2004.
2. Rao VSP, Human Resource Management, Excel Books, New Delhi2005.
3. Aswathappa, K. 'Human Resource and Personnel Management', Tata McGraw-Hill, 1997.
4. Gupta, P.K., Human Resource Management, Dreamtech Press, 2011.
5. Mamoria C.B., 'Personnel Management', Himalaya Pub. House.6. Khanka S.S, 'Human Resource Management' S.Chand, New Delhi,2009.
6. Dessler Gary, 'Human Resource Management', PHI, New Delhi,10th Edition, 2005.
7. Bhattacharya D.K. Human Resource Management, Excel Books, New Delhi, 2006.
8. Subba Rao, Essentials of HRM & Industrial Relations- Text & Cases, Himalaya Pub. House,2011.
9. Gupta C.B., 'Human Resource Management', Sultan Chand & Sons, New Delhi, 2004.

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Programme: **Bachelor of Technology** **Semester –VI**

Suggested List of Laboratory Experiments :- (Expandable): Nil

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total
ECT-1602	Industrial Electronics	3	1	-	External (70)	Internal (30)	Min: 40 (D Grade)	External (Nil)	Internal (Nil)	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Introduced to various electronic components and systems used in modern industry.
Course Outcome	1. To be able to understand about the rectifiers.
	2. To understand the AC voltage regulators and cyclo-converters.
	3. To get to know about the inverters & choppers and industrial applications.

Unit	Contents (Theory)	Marks Weightage
I	**Rectifiers:** Uncontrolled, Half-Controlled and Fully Controlled Single-Phase and Three-Phase Rectifiers for Resistive and Resistive-Inductive Load, Use of Free-Wheel Diode, Dual Converter, Input and Output Performance Parameters, Heat Sink.	**14**
II	**AC Voltage Regulators and Cyclo-converters:** Principle of On-Off Control and Phase Control, Single-Phase Voltage Controller for Resistive and Resistive-Inductive Load, Sequence Control of AC Voltage Controller, Three-Phase Voltage Regulator. Principle of Cyclo-converter, Single-Phase to Single-Phase Step-up and Step-Down Cyclo-Converter, Three-Phase to Single-Phase and Three-Phase to Three-Phase Cyclo-Converter.	**14**
III	**Inverters:** Single-Phase Bridge Inverter, Three-Phase Inverters-180o and 120o Conduction Mode, Voltage Control of Single-Phase Inverters-Single, Multiple, Sinusoidal, Modified Sinusoidal Pulse-Width Modulation, Advanced Modulation Techniques- Trapezoidal, Staircase, Stepped, Harmonic Injection and Delta Modulation. Induction Motor AC Drives.	**14**
IV	**Chopper:** Principle of Step-Down and Step-Up Chopper, Converter Classification, Multi-Phase Chopper, Switching-Mode Regulators-Buck, Boost, Buck-Boost and Cuk Regulators, DC Drives.	**14**
V	**Residential and Industrial Application:** Space Heating and Air Conditioner, High Frequency Fluorescent Lighting, Electronic Timer, Battery Charger, Switch-Mode-Power- Supply (SMPS), Uninterruptible Power Supply (UPS), Static Switches, Induction Heating, Electric Welding, Introduction of HVDC and FACTs.	**14**

Text Book/References Books/ Websites:-

1.Mohan, Undeland and Robbins; Power Electronics; Wiley-India Edition
2. P. S. Bimbhra; Power Electronics; Khanna Publisher.
3.Biswanath Paul; Industrial Electronics; PHI Learning

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Suggested List of Laboratory Experiments :- (Expandable):Nil

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
ECT-1603	Digital Signal Processing	3	1	1	External (70)	Internal (30)	Min: 40 (D Grade)	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	To provide a thorough understanding and working knowledge of design, implementation and analysis DSP systems.
Course Outcome	1. To study about discrete time systems and to learn about FFT algorithms.
	2. To study the design techniques for FIR and IIR digital filters.
	3. To study the properties of random signal, Multirate digital signal processing and about QMF filters.

Unit	Contents (Theory)	Marks Weightage
I	**Discrete-Time Signals and Systems:** Discrete-Time Signals, Discrete-Time Systems, Analysis of Discrete-Time Linear Time-Invariant Systems, Discrete Time systems described by Difference Equation, Implementation of Discrete-Time Systems, Signal flow Graph	**14**
II	**Laplace Transform:** Laplace Transform and its inverse: Definition, existence conditions, Region of Convergence and properties, Application of Laplace transform for the analysis of continuous time LTI system (stability etc.) Significance of poles & zeros. **The z-Transform:** The Direct z-transform, Properties of the z-transform, Rational z-transforms, Inversion of the z-transform, analysis of Linear Time-Invariant systems in the z- domain.	**14**
III	**Frequency Analysis of Discrete Time Signals:** Discrete Fourier series (DFS), Properties of the DFS, Discrete Fourier Transform (DFT), Properties of DFT, Two dimensional DFT, Circular Convolution.	**14**
IV	**Efficient Computation of the DFT:** FFT algorithms, decimation in time algorithm, Decimation in frequency algorithm, Decomposition for 'N' composite number. **DSP Processors:** Brief Introduction of Advanced DSP Processors (e.g. TMS320).	**14**
V	**Digital Filters Design Techniques**: Design of IIR and FIR digital filters, Impulse invariant and bilinear transformation, windowing techniques- rectangular and other windows, Examples of FIR filters, design using Windowing.	**14**

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Text Book/References Books/ Websites:-

1. A.V. Oppenheim and R. W. Schafer; Digital Signal Processing; Prentice Hall.
2. Ingle VK and Proakis John G ; Digital Signal Processing A MATLab based Approach; Cengage Learning
3. John. G. Proakis and Monolakis; Digital Signal Processing; Pearson Education.
4. Salivahanan and Vallavraj; Digital Signal Processing; Mc Graw Hill

Suggested List of Laboratory Experiments :- (Expandable):

1. To Plot Pole Zero from transfer function.
2. Study of Circular Convolution.
3. Study of Sampling Theorem in Time domain.
4. To find the frequency contents of the speech signal using FFT.
5. To design IIR filter using impulse invariant method.
6. To apply FIR LPF to filter the known signal.
7. To design analog filter (low pass, high pass).
8. To design IIR filter using bilinear transformation.
9. To develop a program for computing discrete Fourier transforms.
10. To develop a program for realization of IIR digital filter.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
ECT-1604	Microwave Engineering	3	1	1	External (70)	Internal (30)	Min: 40 (D Grade)	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	To introduce the RF/microwave analysis methods and design techniques.
Course Outcome	1. To understand how microwaves transmits in different modes and medium.
	2. To know about microwave components and scattering parameters & Microwave Vacuum Tube Devices
	3. To know how we can measure different parameters using microwave devices.

Unit	Contents (Theory)	Marks Weightage
I	**Microwave Transmission System:** General representation of E M field in terms of TEM, TE and TM components, Uniform guide structures, rectangular wave guides, Circular Wave guides, Solution in terms of various modes, Properties of propagating and evanescent modes, Dominant modes, Normalized model voltages and currents, Power flow and energy storage in modes frequency range of operation for single mode working, effect of higher order modes, Strip line and micro strip lines general properties, Comparison of coaxial, Micro strip and rectangular wave guides in terms of band width, power handling capacity, economical consideration etc.	**14**
II	**Microwave Networks and Component:** Transmission line ports of microwave network, Scattering matrix, Properties of scattering matrix of reciprocal, nonreciprocal, loss less, Passive networks, Examples of two, three and four port networks, wave guide components like attenuator, Phase shifters and couplers, Flanges, Bends, Irises, Posts, Loads, Principle of operation and properties of E-plane, H-plane Tee junctions of wave guides, Hybrid T, Multi-hole directional coupler, Directional couplers, Microwave resonators- rectangular. Excitation of wave guide and resonators by couplers. Principles of operation of nonreciprocal devices, properties of ferrites, Isolators and phase shifters.	**14**
III	**Microwave Solid State Devices and Application:** PIN diodes, Properties and applications, Microwave detector diodes, detection characteristics, Varactor diodes, parametric amplifier fundamentals, Manley-Rowe power relation MASER, LASER , Amplifiers, Frequency converters and harmonic generators using Varactor diodes, Transferred electron devices, Gunn effect, Various modes of operation of Gunn oscillator, IMPATT, TRAPATT and BARITT.	**14**
IV	**Microwave Vacuum Tube Devices:** Interaction of electron beam with electromagnetic field, power transfer condition. Principles of working of two cavity and Reflex Klystrons, arrival time curve and oscillation conditions in reflex klystrons, mode-frequency characteristics. Effect of repeller voltage variation on power and frequency of output. Principle of working of magnetrons. Electron dynamics in planar and cylindrical magnetrons, Cutoff magnetic field, Resonant cavities in magnetron, Π-mode operation Mode separation techniques, Rising sun cavity and strapping. Principle of working of TWT amplifier. Slow wave structures, Approximate gain	**14**

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	relationship in forward wave TWT.	
V	**Microwave Measurements:** Square law detection, Broadband and tuned detectors. Wave-guide probes, Probe and detector mounts, Slotted line arrangement and VSWR meter, Measurement of wave-guide impedance at load port by slotted line, Microwave bench components and source modulation. Measurement of scattering matrix parameters, High, Medium and low-level power measurement techniques, Characteristics of bolometers, bolometer mounts, Power measurement bridges, Microwave frequency measurement techniques, calibrated resonators (transmission and absorption type). Network Analyzer and its use in measurements.	**14**

Text Book/References Books/ Websites:

1. Y. S. Liao; Microwave Devices; PHI.
2. R. E. Collins; Foundations of Microwave Engineering; 2nd Edition, Wiley Publications
3. J.H. Reich; Microwave Principles; East West Press.
4. D. M. Pozar; Microwave Engineering; 3rd Edition, Wiley Publications

Suggested List of Laboratory Experiments :- (Expandable):

1. To Study the Magic Tee.
2. To Study the Isolator.
3. To Study the Circulator.
4. To determine the standing wave ratio and reflection coefficient.
5. To Study the attenuators.
6. To study the function of multihole directional coupler.
7. To Study the characteristics of Gunn diode.
8. To Study the characteristics of reflex klystron tube and to determine its electronic tuning range.
9. To determine the frequency and wavelength in a rectangular waveguide working on TE10 mode.
10. To Measure the unknown impedance with smith chart.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
ECT-1605	Data Communication & Networks	3	1	1	External (70)	Internal (30)	Min: 40 (D Grade)	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance – Max. Marks: 10
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Introduction to local, metropolitan, and wide area networks using the standard OSI reference model as a framework; introduction to the Internet protocol suite and network tools.
Course Outcome	1. To master the terminology and concepts of the OSI reference model and the TCP-IP reference model.
	2. To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks,
	3. To be familiar with wireless networking concepts.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction to Data Communication and Networks**: Data Communication, Networks – Physical structures; different topologies, Categories of Networks: LAN, MAN, WAN, Interconnection of networks, The Internet, Protocols and Standards, Standards Organizations. Network Models, Layered tasks, The OSI model, different layers in OSI model. TCP/IP protocol suite; different layers, addressing, - physical, logical, port and specific addresses, Analog and digital, digital signals-Bit Length, Digital Signal as a Composite Analog Signal, Transmission of Digital Signals, Data Rate Limits-Noiseless Channel, Noisy Channel.	**14**
II	**Physical Layer**: Digital-to-Digital Conversion-Line Coding, Line Coding Scheme, Block Coding, Scrembling. Multiplexing – Frequency Division, Wavelength Division, Synchronous Time Division, Statistical Time Division Multiplexing. Circuit-Switched Networks – Three Phases, Efficiency, Delay. Datagram Networks - Routing Table, Efficiency, Delay, Datagram Networks in the Internet. Virtual Circuit Networks - Addressing, Three Phases, Efficiency, Delay, Circuit Switched Technology in WANs. Structure of Circuit and Packet switches, Dial-up Modems, Modem Interfacing, Digital Subscriber Line - ADSL, ADSL Lite, HDSL, SDSL, VDSL, Cable TV for Data Transfer- Bandwidth, Sharing, CM and CMTS, Data Transmission Schemes.	**14**
III	**Data Link Layer**: Introduction - Types of Errors, Redundancy, Detection Vs Correction, Forward Error Correction Vs Retransmission, Modular Arithmetic. Block Coding - Error Detection, Error Correction, Hamming Distance, Minimum Hamming Distance. Linear Block Codes, Cyclic Codes - Cyclic Redundancy Check, Hardware Implementation, Polynomials, Cyclic Code Analysis, Advantages. Checksum, Framing - Fixed and Variable-Size. Flow and Error Control, Protocols, Noiseless Channels – Simplest and Stop-and-Wait Protocols. Noisy Channels - Stop-and-Wait Automatic Repeat Request, Go-Back-N Automatic Repeat Request, Selective Repeat Automatic Repeat Request.	**14**

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IV	**Medium Access**: Random Access- ALOHA, Carrier Sense Multiple Access (CSMA), Carrier Sense Multiple Access with Collision Detection (CSMA/CD), Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA). Controlled Access-Reservation, Polling, Token Passing. Channelization- Frequency-Division Multiple Access (FDMA), Time- Division Multiple Access (TDMA), Code-Division Multiple Access (CDMA). IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet, IEEE 802.11- Architecture, MAC Sub layer, Addressing Mechanism, Physical Layer. Bluetooth- Architecture, Radio Layer, Baseband Layer, L2CAP.	**14**
V	**Connecting LANs**: Connecting Devices- Passive Hubs, Repeaters, Active Hubs, Bridges, Two-Layer Switches, Three-Layer Switches, Gateway. Backbone Networks-Bus, Star, Connecting Remote LANs. Virtual LANs - Membership, Configuration, Communication between Switches, Network layer – logical addressing - .IPv4Addresses- Address Space, Notation, Classful Addressing, Classless Addressing, Network Address Translation (NAT). IPv6 Addresses - Structure and Address Space. Internetworking - Need for Network Layer, Internet as a Datagram Network, Internet as a Connectionless Network. IPv4- Datagram, Fragmentation, Checksum, Options. IPv6 - Advantages, Packet Format, Extension Headers. Transition from IPv4 to IPv6.	**14**

Text Book/References Books/ Websites:

1. B. A. Forouzan and Sophia Chung Fegan; Data Communications and Networking; Mc Graw Hill
2. W. Tomasi; Introduction to Data Communications and Networking; Pearson Publication
3. A. S. Tanenbaum; Computer Networks; Prentice Hall
4. A. Elahi and M. Elahi; Data Network and Internet-Communications Technology; Prentice Hall
5. P. C. Gupta; Data Communications and Computer Networks;PHI

Suggested List of Laboratory Experiments :- (Expandable):

1. To Study different Types of Transmission Media.
2. To Study Serial Interface RS-232.
3. To Study Parallel PC-to-PC Communication.
4. To Study Serial PC-to-PC Communication.
5. To Study LAN using various topology.
6. To Study Configure MODEM of Computer.
7. To Study Fiber Optic Communication.
8. To Study Wireless Communication.
9. To Study PC-PC Communication using LAN.
10. To Study PC-PC Communication using WLAN.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (50)
ECT-1606	IC Application Lab	-	-	1	External (Nil)	Internal (Nil)	Nil	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Nil
Course Outcome	1. Knowledge of Electronic Devices and Circuits analysis.
	2. Knowledge of switching theory.
	3. Knowledge of logic design.

Unit	Contents (Theory)	Marks Weightage
-	The main aim of this lab is to teach the linear and non-linear applications of operational amplifiers. Students are made familiar with theory and applications of 555 timers. Students are made to Design combinational logic circuits using digital ICs. Students are gain the practical hands on experience by exposing them to various linear and digital IC applications. The students will have an understanding of the concepts involved in various linear integrated circuits and Digital ICs and their various applications.	**50**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable):

Student should perform & test at least 10 electronic components/instruments related to subjects.

1. To design Op-amp as Integrator.
2. To design Op-amp as Differentiator
3. To design and obtain the frequency response of second order High Pass Filter (HPF).
4. To construct and study the behavior of logarithmic and antilogarithmic amplifier.
5. To design a Wien-bridge oscillator using operational amplifier.
6. To construct and study the operation of a monostable multivibrator using 555 IC timer.
7. To construct and study the voltage to current convertor.
8. To design & implementation of Boolean Functions, Adder/ Subtractor circuits using gates.
9. Design and Implementation of JK FF, RS FF, D Flip-flops using gates.
10. Design and Implementation of 4:1 multiplexer.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (50)
BT-1607	Research Methodology	-	-	1	External (Nil)	Internal (Nil)	Nil	External (Nil)	Internal (50)	Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test –Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 50	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/ Attendance – Max. Marks: 50

Pre-Requisite	Nil
Course Outcome	1. To understand the objective and types of research.
	2. To understand basic idea or hypothesis of research.
	3. To know about how data is collected for analyzing process & thesis writing.

Unit	Contents (Theory)	Marks Weightage
I	**Objectives and types of research:** Motivation and objectives – Research methods *vs* Methodology. Types of research – Descriptive *vs*. Analytical, Applied *vs*. Fundamental, Quantitative *vs*. Qualitative, Conceptual *vs*. Empirical.	**50**
II	**Research Formulation:** Defining and formulating the research problem - Selecting the problem - Necessity of defining the problem - Importance of literature review in defining a problem.	
III	**Research design and methods:** Research design – Basic Principles- Need of research design, Features of good design – Important concepts relating to research design – Observation and Facts. Developing a research plan - Exploration, Description, Diagnosis, and Experimentation.	
IV	**Data Collection and analysis:** Execution of the research - Observation and Collection of data - Methods of data collection – Sampling Methods- Data Processing and Analysis strategies - Data Analysis with Statistical Packages - Hypothesis-testing, Generalization and Interpretation.	
V	**Reporting and thesis writing:** Structure and components of scientific reports - Types of report – Technical reports and thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports – Illustrations and tables - Bibliography, referencing and footnotes.	

Text Book/References Books/ Websites:

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal,;An introduction to Research Methodology;RBSA Publishers.
2. Kothari, C.R.;Research Methodology: Methods and Techniques;New Age International.
3. Sinha, S.C. and Dhiman; Research Methodology; Ess Publications. 2 volumes.

PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –VI**

Suggested List of Laboratory Experiments :- (Expandable): Nil

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (50)
BT-1608	GD/Seminar	-	-	1	External (Nil	Internal (Nil)	Nil	External (Nil)	Internal (50)	Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: 50

Pre-Requisite	***Nil***
Course Outcome	1. Develop confidence and students should able to share their views publically.
	2. Understand and critique scientific presentations

Unit	Contents (Theory)	Marks Weightage
-	Objective of GD and seminar is to improve the Mass Communication and Convincing/ understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves. Effective power point presentation of scientific research of concern discipline where students will prepare, practice, and present short scientific seminars, and receive feedback from each other that will help us give even better presentations in the future. This effort will help them to communicate their ideas more clearly. Evaluation will be done by assigned faculty based on group discussion and power point presentation.	**50**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable):

Students should prepare and submit hard and soft copy of their report to assigned faculty before End Sem Examination.