IPS Academy, Institute of Engineering & Science

(A UGC Autonomous Institute, Affiliated to RGPV, Bhopal)

Scheme Based on AICTE Flexible Curriculum

Department of Computer Science & Engineering

Bachelor of Technology (B.Tech.) [Computer Science & Engineering (IoT)]

VI Semester

S.No.	Subject Code	Category	Subject Name	Maximum Marks Allotted					Total Marks	Contact Hours per week			Total Credits
				Theory			Practical			L	T	P	
				End Sem	Mid Sem. Exam.	Quiz/ Assignment	End Sem	Term work / Lab Work & Sessional					
1.	BSC-CIOT601	BSC	Scientific Aptitude	70	20	10	–	–	100	3	1	–	4
2.	PCC-CIOT601	PCC	Compiler Design	70	20	10	60	40	200	2	1	2	4
3.	PCC-CIOT602	PCC	Embedded System and Robotics	70	20	10	60	40	200	2	1	2	4
4.	PEC-CIOT601	PEC	Elective -II	70	20	10	–	–	100	3	–	–	3
5.	OEC-CIOT601	OEC	Open Elective-II	70	20	10	–	–	100	3	–	–	3
6.	PROJ-CIOT601	PROJ	Project-I	–	–	–	60	40	100	–	–	4	2
7.	PROJ-CIOT602	PROJ	Evaluation of Internship-I	–	–	–	60	40	100	–	–	4	2
8.	–	PROJ	Internship-II	To be completed during semester break. Its Evaluation / Credit to be added in Seventh Semester.									
			Total	**350**	**100**	**50**	**240**	**160**	**900**	**13**	**3**	**12**	**22**

Electives-II	Open Electives-II
PEC-CS601(A) Foundation of Artificial Intelligence & Machine Learning	OEC-CIOT601(A) Stress Management
PEC-CS601(B) Cyber Security	OEC-CIOT601(B) Business Communication
PEC-CS601(C) Adhoc and Wireless Sensor Networks	OEC-CIOT601(C) Foreign Language (German/ French)
PEC-CS601(D) IoT Architecture and its Protocols	OEC-CIOT601(D) Digital Marketing & SEO

1 Hr Lecture	1 Hr Tutorial	2 Hr Practical
1 Credit	1 Credit	1 Credit

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VI-Semester

BSC-CIOT601	Scientific Aptitude	3L: 1T: 0P (4hrs.)	4 credits

Prerequisite: None

Course Objective:

This course aims to sensitize students with the gamut of skills which facilitate them to enhance their employability quotient.

Course Contents :(40 hrs)

Module 1: (10hrs.)

Number System, Percentage, Ratio and Proportion, Partnership, Profit & Loss, Simple & compound Interest.

Module 2: (10 hrs.)

Allegation & Mixture, Average, Time &Distance, Time and Work, Mensuration 2D & 3D, Permutation and Combination.

Module 3: (08 hrs.)

Probability, Co-ordinate Geometry, Inequalities, Functions, Progressions, Set Theory, Quadratic equations, Surds.

Module 4: (06hrs.)

Coding Decoding, Sitting Arrangements, Data sequence/Calendars, Direction Sense Test, Blood Relation.

Module 5: (06hrs.)

Syllogism, series, Analogy Classification, Clocks, Statements and Arguments, Puzzle Test, Cubes and dice.

Course Outcome:

1. Understand the basic concepts of quantitative ability.
2. Applying basic mathematics skills to interpret data, draw conclusions, and solve problems.
3. Developing proficiency in numerical reasoning;
4. Understand the basic concepts of logical reasoning Skills.
5. Develop the puzzle solving skills.

List of Text / Reference Books:

1. R.S. Aggarwal, "Quantitative Aptitude",S. Chand Publication,RevisedEdition,2018.

2. M. Tyra, "Magical Book on Quicker Maths", BSC Publishing Co PvtLtd,2018.

3. K.Kundan,"MagicalBookSeries:DataInterpretation",BSCPublishingCoPvtLtd,2012.

4. H.William Dettmer , "The Logical Thinking process", Productivity Press(India)Ltd.,2001.

5. Aditi Agarwal, "An expert guide to problem solving: with practical examples", Createspace Independent Pub,2016.

6. George J Summers , "The Great Book of Puzzles &Teasers", Jaico Publishing House,1989.

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VI-Semester

PCC-CIOT601	Compiler Design	2L: 1T: 2P (4hrs.)	4 credits

Pre-requisite: Theory of Computation

Course Objective:
To explain the different stages in the process of compilation.

Course Contents :(40 hrs)
Module 1: (06 hrs.)
Introduction to compiling & Lexical Analysis
Introduction of Compiler, Major data Structure in compiler, types of Compiler, Front-end and Back- end of compiler, Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, Single & Multipass Compiler, Lexical analysis: Input buffering, Specification & Recognition of Tokens, Design of a Lexical Analyzer Generator, LEX.

Module 2: (15 hrs.)
Syntax Analysis &Syntax Directed Translation
Syntax analysis: CFGs, Top down parsing, Brute force approach, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence parsing, LR parsers (SLR,LALR, LR),Parser generation. Syntax directed definitions: Construction of Syntax trees, Bottom up evaluation of S-attributed definition, L attribute definition, Top down translation, Bottom Up evaluation of inherited attributes Recursive Evaluation, Analysis of Syntax directeddefinition.

Module 3: (6 hrs.)
Type checking: type system, specification of simple type checker, equivalence of expression, types, type conversion, overloading of functions and operations, polymorphic functions. Runtime Environment: storage organization, Storage allocation strategies, Parameter passing, dynamic storage allocation, Symbol table, Error Detection & Recovery.

Module 4: (06 hrs.)

Intermediate code generation: Declarations, Assignment statements, Boolean expressions, Case statements, back patching, Procedure calls Code Generation: Issues in the design of code generator, Basic block and flow graphs, Register allocation and assignment, DAG representation of basic blocks, peephole optimization, and generating code from DAG.

Module 5: (07 hrs.)

Introduction to Code optimization: sources of optimization of basic blocks, loops in flow graphs, dead code elimination, loop optimization, Introduction to global data flow analysis, Code Improving transformations ,Data flow analysis of structure flow graph Symbolic debugging of optimized code.

Course Outcome:

1.   Understand the overview of phase of compiler and Lexical analysis.
2.   Design and implement various parsing techniques of compiler.
3.   Apply type checking for semantic analysis and analyze Run time environment.
4.   Design and implement different intermediate code generation techniques.
5.   Analyze various code optimization techniques

List of Text / Reference Books:

1.A.V. Aho, R. Sethi, and J.D. Ullman. "Compilers: Principles, Techniques and Tools" , Pearson Education,2nd Edition ,2007.
2.V Raghavan, "Principals of Compiler Design", TMH Pub.,2017
3.Louden. "Compiler Construction: Principles and Practice", Cengage Learning,1997
4.A. C. Holub. "Compiler Design in C" , Prentice-Hall Inc., 1993.
5.Ronald Mak, "Writing compiler & Interpreters", Willey Pub.,3rd Edition,2009

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VI-Semester

PCC-CIOT602	Embedded System and Robotics	2L: 1T: 2P (4hrs.)	4 credits

Pre-requisite: Fundamentals of microprocessors, microcontrollers, programming and interfacing.

Course Objective: The objective of this course is that students can learn fundamental concepts of embedded system design and robotics and advanced microcontrollers like PIC, AVR and ARM.

Module 1: (7hrs.)
Introduction: Embedded Systems and general purpose computer systems, history, classifications, applications and purpose of embedded systems, RISC and CISC controllers, Big endian and Little endian processors, Application specific ICs, Programmable logic devices, COTS, sensors and actuators, communication interface, embedded firmware, other system components.

Module 2: (7hrs.)
Robotics Actuators: Relays and their types , Specifications and characteristics of Stepper motors ,AC motors, DC motors and servo motors. Power driving circuit and Power management for actuators, Torque and speed relationship of motors, Motor speed controlling techniques.

Module 3: (7hrs.)
Classification of Robots, Basics of matrices, Rotations & transformations, Introduction to D-Hparametersanditsphysicalsignificance,Orientationofgripper,Trajectoryplanning.

Module 4: (6hrs.)
8 bitPIC(1PICF877)MicrocontrollerArchitecture,memorytechnologies,timingcircuit,power- up& reset, parallel ports, ADC, interrupts, PWM, counters & timers, Instruction set, Memory mapping, Peripherals, Software development environment, programming tools.AVR(ATMEGA328) Features, Architecture, Instruction Set, Peripherals, Programming Interfaces, Programming in embedded C.

Module 5: (7hrs.)

Interfacing of PIC and AVR: LED, LCD, 7segmentdisplay, motor driver, ADC, DAC, memory, timers, delays, keyboard, GSM. Introduction to ARM microcontroller.

Course Outcome:

Students should be able to:
1. Understand the fundamentals and history of embedded system design.
2. Define different types of Actuators used in Robotics and illustrate concepts about their working.
3. Classify types of Robots in different applications and define various concepts related to their movements.
4. Understand PIC & AVR microcontroller architectures and programming in Robotics and embedded systems.
5. Design automated embedded systems by interfacing different Modules with advance controllers. Illustrate overview of ARM microcontroller architectures.

Text/ReferenceBooks:

1. Wayne Wolf "Computers as components: Principles of Embedded Computing System Design", The Morgan Kaufmann Series in Computer Architecture and Design, 2013.
2. Lyla B. Das," Embedded Systems an Integrated Approach", Pearson Education, 2013.
3. Raj Kamal, "Embedded systems Architecture, Programming and Design", Tata McGrawHill, 2011.
4. Shibu K V," Introduction to Embedded Systems", McGraw Hill Education(India) Private Limited, 2014
5. MuhammadAliMazidi,"Theavrmicrocontrollerandembeddedsystemusingassemblyandc",3rd edition,Pearson,2010.
6. Rajesh Singh, "Embedded System Based on AtmegaMicrocontroller:Simulation,Interfacing&Projects",AlphaScience,2016.
7. MortonJohn,"PICMicrocontroller:YourPersonalIntroductoryCourse",3[rd]edition,English,Paperback,2005.
8. PhillipJohnMcKerrow,"IntroductiontoRobotics",1[st]edition, Paperback.
9. Dr.KevinKlein,"Robotics:DiscovertheRoboticInnovationsoftheFuture-AnIntroductoryGuidetoRobotics",1[st]edition,Paperback,2016.
10. Muhammad Ali Mazidi, "PIC Microcontroller and Embedded Systems: Using assembly and Cfor PIC 18",1[st]edition,Pearson,2008.

List of Experiments:

1. Write a program in embedded C to read temperature from LM35 and display on LCD.
2. Write a program in embedded C to read data from keypad & display on LCD.
3. Write a program in embedded C to control speed of motor.
4. Write a program in embedded C to control servomotor.
5. Write a program in embedded C to control IR sensor.
6. Code a sequence in Robotic software to pick and place an object by Robotic hand.
7. Code a sequence in Robotic software to control hands of a humanoid Robot.
8. Code a sequence in Robotic software to control legs of a humanoid Robot.
9. Code a sequence in Robotic software to make a Robot walk.
10. Code a sequence in Robotic software to make a Robot dance.

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VI-Semester   **Elective-II**

PEC-CS601(A)	Foundation of Artificial Intelligence & Machine Learning	3L: 0T: 0P (3hrs.)	3 credits

Pre-requisite: Engineering Mathematics.

Course Objective:
This course provides a concise introduction to the fundamental concepts in artificial intelligence and machine learning.

Course Contents :(40 hrs)

Module 1: (10hrs.)
Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Prepositional and predicate logic, monotonic and on monotonic reasoning, forward Reasoning, backward reasoning.

Module 2: (06hrs.)
Introduction: Basic dentitions, types of learning, hypothesis space and inductive bias, evaluation, cross-validation. Linear regression, Decision trees, over fitting.

Module 3: (10 hrs.)
Logistic Regression, Support Vector Machine, Kernel function and Kernel SVM. Neural network: Preceptor, multilayer network, back-propagation, introduction to deep neural network. Convolution neural network, flattening, sub sampling, padding, stride, convolution layer, pooling layer, loss layer, dance layer 1x1 convolution, inception network, input channels, transfer learning, one shot learning, dimension reductions, implementation of CNN like tensor flow, keras etc.

Module 4: (08 hrs.)

Ensemble learning, clustering: k-means, adaptive hierarchical clustering, and Gaussian mixture model. Application of machine learning in computer vision, speech processing, natural language processing etc, Case Study: Image Net Competition

Module 5: (06hrs.)

Instance based learning, Feature reduction, Collaborative filtering based recommendation. probability and Bayes learning.

Course Outcome:

1. State the overview of the Artificial intelligence.
2. Explain the types of learning, linear regression and decision tree.
3. Discuss the various classification techniques and convolution neuralnetwork.
4. Explain the Ensemble learning and clustering techniques.
5. Discuss the recommendation system and Bayes learning.

List of Text / Reference Books:

1. Rich E and Knight K, "Artificial Intelligence", The McGraw- Hill,.3rdEdition,2008
2. Tom Mitchell, "Machine Learning", McGraw- Hill, First Edition, 1997.
3. Ethem Alpaydin, "Introduction to Machine Learning Edition"2, MIT Press, Third Edition,2014.

Perspectives:

1. Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems.
2. AI is to enable computers to perform intellectual tasks as decision making, problem solving, perception, understanding human communication (in any language, and translate among them
3. Machine Learning is an Application of AI & gives devices the ability to learn from their experiences without doing any coding.

Recommendations:

Students pursuing a concentration in **AI & ML** must also take the following concentration Requirements and electives:
1. Deep & Reinforcement Learning
2. Robotics
3. Embedded System
4. Soft Computing
5. Computational Intelligence
6. Pattern Recognition
7. Data Visualization
8. Web & Information Retrieval
9. Data Science

Studying artificial intelligence & Machine Learning opens a world of opportunities.

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VI-Semester   **Electives-II**

PEC-CS601(B)	Cyber Security	3L: 0T: 0P (3hrs.)	3 credits

Pre-requisite: None

Course Objective:

Analyze and resolve security issues in an organization to secure an IT infrastructure.

Course Contents :(40 hrs)

Module 1: (06hrs.)
Introduction of Cyber Crime, Challenges of cyber crime, Classifications of Cybercrimes: E- Mail Spoofing, Spamming, Internet Time Theft, Salami attack/Salami Technique.

Module 2: (8 hrs.)
Web jacking, Online Frauds, Software Piracy, Computer Network Intrusions, Password Sniffing, Identity Theft, cyber terrorism, Virtual Crime, Perception of cyber criminals: hackers, insurgents and extremist group etc. Web servers were hacking, session hijacking.

Module 3: (10 hrs.)
Cyber Crime and Criminal justice: Concept of Cyber Crime and the IT Act, 2000, Hacking, Teenage Web Vandals, Cyber Fraud and Cheating, Defamation, Harassment and E- mail Abuse, Other IT Act Offences, Monetary Penalties, jurisdiction and Cyber Crimes, Nature of Criminality, Strategies to tackle Cyber Crime and Trends.

Module 4: (10 hrs.)
The Indian Evidence Act of 1872 v. Information Technology Act, 2000: Status of Electronic Records as Evidence, Proof and Management of Electronic Records; Relevancy, Admissibility and Probative Value of E-Evidence, Proving Digital Signatures, Proof of Electronic Agreements, Proving Electronic Messages.

Module 5: (06hrs.)
Tools and Methods in Cybercrime: Proxy Servers and Anonymizers, Password Cracking, Key loggers and Spyware, virus and worms, Trojan Horses, Backdoors, DoS and DDoS Attacks , Buffer and Overflow,

Attack on Wireless Networks, Phishing : Method of Phishing, Phishing Techniques. Introduction to KALILinux.

Course Outcome:
1. Define and explain the concepts of cyber crime and its classification.
2. Delineate the components online frauds, intrusions, virtual crimes andhacking.
3. Knowledge of different act's in cyber security
4. List the various parts of IT act related to electronic records.
5. Knowledge of different Cyber Security tools.

List of Text / Reference Books:
1. Jonathan Clough, "Principles of Cyber crime", Cambridge University Press, 2ndEdition, 2015.
2. John R. Vacca, " Computer Forensics: Computer Crime Scene Investigation", CharlesRiverMedia, 2ndEdition,2005.
3. Vivek Sood"Cyber Law Simplified",TMH,2001.
4. Nina Godbole, SunitBelapure , "Cyber Security",Wiley-India
5. William Hutchinson, Mathew Warren, "Information Warfare: Corporate attack and defense in digital world" , Elsevier, Reed International and Professional Publishing Ltd,2001
6. Harish Chander , "Cyber Laws and IT Protection", Prentice Hall India Learning Private Limited,2012

Perspectives:

1. Computer security, cyber security or any other related terminology is the protection of computers from any harm or damage, either physical or otherwise, by unauthorized users.

2. Cyber Security is a very broad term but is based on three fundamental concepts known as "The CIA Triad". It consists of Confidentiality, Integrity, and Availability.

3. Cyber Security study programmers teach you how to protect computer operating systems, networks, and data from cyber attacks.

4. Confidentiality, honesty, and availability are three basic security principles that are essential for information on the internet.

Recommendations:

Students pursuing a concentration in **Cyber Security** must also take the following concentration

Requirements and electives:

Cyber Security are more popular than ever. Living in the digital age means hackers and cyber terrorists have endless opportunities to exploit individuals, government institutions, and even

Large companies

1. Project-I

2. Project-II

3. Project-III

4. Mobile Application Development

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VI-Semester   **Electives-II**

PEC-CS601(C)	Adhoc and Wireless Sensor Networks	3L: 0T: 0P (3hrs.)	3 credits

Pre-requisite: Computer Networking and Protocol Basics

Course Objective: The objective of this course is to learn Ad hoc network and Sensor Network fundamentals and have an in-depth knowledge on sensor network architecture and design issues

Course Contents: (42 hrs.)

Module 1: (09 hrs.)
AD HOC NETWORKS INTRODUCTION AND ROUTING PROTOCOLS: Elements of Ad hoc Wireless Networks, Issues in Ad hoc wireless networks, Example commercial applications of Ad hoc networking, Ad hoc wireless Internet, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classifications of Routing Protocols, Table Driven Routing Protocols - Destination Sequenced Distance Vector (DSDV), On–Demand Routing protocols –Ad hoc On–Demand Distance Vector Routing (AODV)

Module 2: (08 hrs.)
SENSOR NETWORK INTRODUCTION & ARCHITECTURES: Challenges for Wireless Sensor Networks, Enabling Technologies for Wireless Sensor Networks, WSN application examples, Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes, Network Architecture - Sensor Network Scenarios, Transceiver Design Considerations, Optimization Goals and Figures of Merit.

Module 3: (09 hrs.)
WSN NETWORKING CONCEPTS AND PROTOCOLS: MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts - S-MAC, The Mediation Device Protocol, Contention based protocols - PAMAS, Schedule based protocols – LEACH, IEEE 802.15.4 MAC protocol, Routing Protocols Energy Efficient Routing, Challenges and Issues in Transport layer protocol

Module 4: (08 hrs.)

SENSOR NETWORK SECURITY: Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Layer wise attacks in wireless sensor networks, possible solutions for jamming, tampering, black hole attack, flooding attack. Key Distribution and Management, Secure Routing – SPINS, reliability requirements in sensor networks.

Module 5: (08 hrs.)

SENSOR NETWORK PLATFORMS AND TOOLS 9 Sensor Node Hardware – Berkeley Motes, Programming Challenges, Node-level software platforms – TinyOS, nesC, CONTIKIOS, Node-level Simulators – NS2 and its extension to sensor networks, COOJA, TOSSIM, Programming beyond individual nodes – State centric programming.

Course Outcome:

1. Describe the basics of Ad hoc networks and Wireless Sensor Networks.
2. Apply this knowledge to identify the suitable routing algorithm based on the network and user requirements
3. Apply the knowledge to identify appropriate physical and MAC layer protocols
4. Understand the transport layer and security issues possible in Ad hoc and sensor networks.
5. Familiar with the OS used in Wireless Sensor Networks and build basic modules

List of Text / Reference Books:

1. C. Siva Ram Murthy and B. S. Manoj, ―Ad Hoc Wireless Networks Architectures and Protocols‖, Prentice Hall, PTR, 2004.

2. Holger Karl , Andreas willig, ―Protocol and Architecture for Wireless Sensor Networks‖, John wiley publication, Jan 2006.

3. Feng Zhao, Leonidas Guibas, ―Wireless Sensor Networks: an information processing approach‖, Elsevier publication, 2004.

4 Charles E. Perkins, ―Ad Hoc Networking‖, Addison Wesley, 2000.

5 I.F. Akyildiz, W. Su, Sankarasubramaniam, E. Cayirci, ―Wireless sensor networks: a survey‖, computer networks, Elsevier, 2002.

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VI-Semester   **Electives-II**

PEC-CS601(D)	IoT Architecture and its Protocols	3L: 0T: 0P (3hrs.)	3 credits

Pre-requisite: IoT Basics and Computer Network

Course Objective:
This course aims to impart knowledge on IoT Architecture and various protocols, study their implementations.

Course Contents :(44 hrs)

Module 1: (10hrs.)
IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management

Module 2: (10hrs.)
IoT Architecture-State of the Art – Introduction, State of the art, Reference Model and architecture, IoT reference Model - IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints-Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control

Module 3: (08hrs.)
PHY/MAC Layer(3GPP MTC, IEEE 802.11, IEEE 802.15), WirelessHART,ZWave,Bluetooth Low Energy, Zigbee Smart Energy, DASH7 - Network Layer-IPv4, IPv6, 6LoWPAN, 6TiSCH,ND, DHCP, ICMP, RPL, CORPL, CARP

Module 4: (08hrs.)
Transport Layer (TCP, MPTCP, UDP, DCCP, SCTP)-(TLS, DTLS) – Session LayerHTTP, CoAP, XMPP, AMQP, MQTT

Module 5: (08hrs.)

Service Layer -oneM2M, ETSI M2M, OMA, BBF – Security in IoT Protocols – MAC 802.15.4 , 6LoWPAN, RPL, Application Layer

Course Outcome:

1. Understand the Architectural Overview of IoT
2. Understand the IoT Reference Architecture and RealWorld Design Constraints
3. Enabling students to understand the various IoT Protocols of Datalink, Network
4. Prepare students to work with the various IoT Protocols of Transport Layer
5. Understand the various IoT Protocols of Service Layer

List of Text / Reference Books:

1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.

2. Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI

3. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer

4. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Willy Publications

5. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-onApproach)", 1 st Edition, VPT, 2014.

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VI-Semester   **Open Elective-II**

OEC-CIOT601(A)	Stress Management	3L: 0T: 0P (4hrs.)	3 credits

Course Objectives

The objective of this course is to enable students to understand and learn how to use various techniques and determine the most appropriate method to aid in managing reaction to stress.

Course Contents (40 Hrs.)

Module-1: (08hrs.)

Introduction to Stress

Introduction to stress: Meaning, Definition, Eustress and Distress, Types of stress: Acute stress, Episodic Acute stress and chronic stress, Signs and Symptoms

Module -2: (08hrs.)

Sources of Stress across the Lifespan

Psychological, Social, Environmental, Academic, Family and Work stress, Adaptive and Maladaptive Behavior, Individual and Cultural Differences

Module – 3: (08hrs.)

Impact of Stress

Physiological Impact of stress -Autonomic Nervous System Changes, Changes in Brain, General adaptive syndrome (GAD), Quality of sleep, Diet and Health effects (ii) Psychological Impact of stress - Impaired Mental functions, Poor memory (iii) Social Impact of stress - Stressful Life Events, Social support and health

Module - 4 : (08hrs.)

Success over Stress

Understanding your stress level, Role of Personality Pattern, Self Esteem, Locus of Control, Role of Thoughts Beliefs and Emotions Coping Mechanisms: - Coping Mechanisms: Appraisal focus Use of Audio and Video Aids , Cultural Activities, Autogenic Training, Biofeedback, Relaxation, Yoga and Meditation Emotional focused and Problem focused , 'Fight or Flight' Response, Stress warning signals

Module –5: (08hrs.)
Project based learning
Project report on Stress Management (Students will prepare and submit a report under the guidance of the mentors)

Course Outcomes
Identify, describe and practice research-based coping strategies and relaxation techniques that contribute to managing life's stress.

Text Books:

1. Greenberg, J. S. (2017). Comprehensive Stress Management (14th edition). New York: McGraw Hill.
2. Roy, Sumita. (2005) Managing Stress: Handle, Control, Prevent Sterling Publisher
3. Davis M. (2000) *The Relaxation and Stress Reduction Work Book*, New Harbinger inc.
4. Simmons M., Daw W. (1994) *Stress, Anxiety, Depression: a Practical Workbook,* Winslow Press.
5. Tyler M. (1999) *Stress Management Training for Trainers Handbook*, Living with Stress Ltd
6. Udai, Y. (2015). Yogasan aur pranayam. New Delhi: N.S. Publications

Reference Books:

1. Cooper K. (1991) *Overcoming Hypertension*, Bantam Books.
2. Hambly K., Muir A. (1997) *Stress Management in Primary Care*, Butterworth Heinemann.
3. Jones H. (1997) *I'm too Busy to be Stressed*, Hodder and Stoughton
4. Payne R. (1995) *Relaxation Techniques: a Practical Handbook for Healthcare Professionals,* Churchill Livingstone.
5. Steinmetz J. (1980) *Managing Stress Before it Manages You,* Bull Publishing.

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VI-Semester   **Open Elective-II**

OEC-CIOT601(B)	Business Communication	3L: 0T: 0P (4hrs.)	3 credits

Course Objective:
The course is designed to hone the communication skills of the students and enable them to be an integral part of the corporate world by providing an overview of prerequisites to business communication.

Course Contents: (40 hrs.)
Module-I: (8Hrs.)
Communication: It's Interpretation
Basics of Communication: Process, Components and Factors of Communication. Types of Communication, Global Aspects, Ethical Aspects, Legal Aspects, Gender Communication, Communication in Organization, Communication during crisis

Module-II: (8Hrs.)
Communication Core:
Communication Skills for Team and Leadership Effectiveness: Managerial Communication, Organizational Communication, Persuasive Communication, Negotiation Skills, Intercultural Communication Competence

Module- III: (8Hrs.)
Communication and Digitalization:
Email, Phone calls, Video conferencing, Types of instant messaging: SMS, Business Blogs, Facebook, Instagram, Twitter, Linkedin, Snapchat, Telegram and Web chats

Module- IV :(8Hrs.)
Business Correspondence:
Writing Skills in business and public administration in India: Effective writing, Job Application, Bio Data, Curriculum Vitae, Resume, Notice, Agenda & Minutes of meetings, Memorandum

Module–V: (8Hrs.)
Presentation Skills:
Elements of Presentation, Tips for Effective Presentation, Practice and Perform **(Presentation prepared by the students will be evaluated**)

Course Outcomes:
To develop knowledge, skills, and judgment around human communication that facilitates their ability to work collaboratively professionally.

1. To develop an ability to understand the different types of communication and demonstrate an ability to better understand and adapt to others and their behaviors
2. To apply changes to distinguish mass communication and media in the digital era.
3. To apply to draft effective business correspondence with brevity and clarity to maintain healthy business relationship.
4. To learn to demonstrate students verbal and non-verbal communication ability through presentations.

Text Books:
1. Professional Communication by Aruna Koneru, Tata McGraw-Hill Publishing Company Limited, New Delhi,2005
2. Effective Technical Communication by M. Ashraf Rizvi, Tata McGraw-Hill Publishing Company Limited, New Delhi,2005
3. Communication Skill for Engineers and Scientist by Sangeeta Sharma and Vinod Mishra, PHI Learning, New Delhi, 2015
4. Business Communication by Dr. V.G. Sadh, Thakur Publications, Lucknow,2013
5. Business Correspondence and Report Writing by R.C. Sharma and Krishna Mohan, Tata McGraw-Hill Publishing Company Limited, New Delhi,2008

Reference Books:
1. Bonet, Diana. The Business of Listening: Third Edition. New Delhi: Viva Books, 2004.
2. Bovee, Courtland L, John V. Thill & Barbara E. Schatzman. Business Communication Today: Tenth Edition. New Jersey: Prentice Hall, 2010
3. Guffey, Mary Ellen. Essentials of Business Writing. Ohio: SouthWestern College Pubg., 2000.
4. Hughes, Shirley. Professional Presentations: A Practical Guide to the Preparation and Performance of Successful Business Presentations. Sydney: McGraw-Hill, 1990
5. Monippally, Matthukutty, M. Business Communication Strategies. New Delhi: Tata McGraw-Hill Publishing Company Ltd., 2001.

VI-Semester   **Open Elective-II**

OEC-CIOT601(C)	Foreign Language (German/ French)	3L: 0T: 0P (4hrs.)	3 credits

Course Objective:
To acquaint students with French and impart an understanding of the language at the beginner level.

Course Content: (40 hrs.)
Unit-I: (8Hrs.)
Se présenter et présenter sa famille, Saluer, Les nationalites, Les nombres, Décrire une personne (son physique et son caractère)

Grammaire - Les verbes au présent, Les adjectifs possessifs

Unit-II: (8Hrs.)
Décrire et situer un logement, Parler d'une ville et de ses commerces

Grammaire - Les pronoms interrogatifs où et combien de, Les articles contractés, Les prépositions de situation

Unit- III: (8Hrs.)
Exprimer les goûts et les préférences, Décrire des vêtements et des couleurs, Parler des activités de loisirs
Grammaire - Les adjectifs démonstratifs, Les quantités

Unit- IV: (8Hrs.)
Indiquer l'heure ou la date (le calendrier), Indiquer la fréquence d'une activité, Parler des préférences alimentaires (plats et boissons), Commander dans un restaurant
Grammaire - Les verbes pronominaux

Unit -V: (8Hrs.)

Décrire le temps, Parler des vacances, Réserver un billet et une chambre d'hôtel

Grammaire - Le passé compose

Course Outcome:

1. Students will be able to recognize French language and apply its grammar to describe themselves and their family.
2. Students will apply French vocabulary to describe and locate accommodation in a city and also its commerce.
3. Students will be able to use French to express their tastes and preferences as well as describe their hobbies.
4. Students will be able to apply their knowledge in practical situations like ordering in a restaurant and interpret time and dates.
5. Students will be able to describe the weather and their vacations as well as schedule and book tickets and a room and compute bills.

Reference Books and Internet resources:

Saison 1 Methode de Francais

1. Les Cles de Nouveau A1
2. https://www.lawlessfrench.com
3. https://www.youtube.com/user/learnfrenchwithalexa

IPS Academy, Institute of Engineering & Science
(A UGC Autonomous Institute, Affiliated to RGPV, Bhopal)
Scheme Based on AICTE Flexible Curriculum
Department of Computer Science & Engineering
Bachelor of Technology (B.Tech.) [Computer Science & Engineering (IoT)]

VI-Semester   **Open Elective-II**

OEC-CIOT601(D)	Digital Marketing & SEO	3L: 0T: 0P (4hrs.)	3 credits

Course Objective:
The objective of subject is to facilitate students to understand digital marketing and its importance.

Course Contents: (40 hrs.)
Module 1: (08 hrs)
Digital Marketing: Introduction, Moving from Traditional to Digital Marketing, Integrating Traditional and Digital Marketing, Reasons for Growth. Need for a comprehensive Digital Marketing Strategy. Concepts: Search Engine Optimization (SEO); Concept of Pay Per Click

Module 2: (08 hrs)
Social Media Marketing: Introduction, Process - Goals, Channels, Implementation, Analyze. Tools: Google and the Search Engine, Facebook, Twitter, YouTube and LinkedIn. Issues: Credibility, Fake News, Paid Influencers; Social Media and Hate/ Phobic campaigns. Analytics and linkage with Social Media. The Social Community.

Module 3: (08 hrs)
Email Marketing: Introduction, email marketing process, design and content, delivery, discovery. Mobile Marketing: Introduction and concept, Process of mobile marketing: goals, setup, monitor, analyze; Enhancing Digital Experiences with Mobile Apps. Pros and Cons; Targeted advertising. Issues: Data Collection, Privacy, Data Mining, Money and Apps, Security, Spam. Growth Areas.

Module 4: (08hrs)
Managing Digital Marketing: Content Production; Video based marketing; Credibility and Digital Marketing; IoT; User Experience; Future of Digital Marketing.

Module 5: (08 hrs)

SEO Analytics, Monitoring & Reporting : Google Search Console (GSC),Key Sections & Features of GSC; How to monitor SEO progress with Key Features of GSC: Overview, Performance, URL Inspection, Coverage, Sitemaps, Speed, Mobile Usability, Backlinks, Referring Domains, Security& Manual Actions, How to do SEO Reporting.

Course Outcome:

1. Understand the concept of digital marketing and its real-world iterations.
2. Articulate innovative insights of digital marketing enabling a competitive edge.
3. Understand how to create and run digital media based campaigns.
4. Identify and utilise various tools such as social media etc.
5. Understand how to do SEO Audit.

List of Text / Reference Books:

2. Dodson, Ian, " The Art of Digital Marketing - The Definitive Guide to Creating Strategic", Targeted, and Measurable OnlineCampaigns. Wiley, 2016.
3. Ryan, Damien, " Understanding Digital Marketing - Marketing Strategies for Engaging the Digital Generation", Kogan Page Limited, 2008.
4. Gupta, Sunil, "Driving Digital Strategy" Harvard Business Review Press, 2018.
5. Tuten, Tracy L. and Solomon, Michael R. "Social Media Marketing", Sage, 3rd edition 2017.
6. Bhatia, Puneet S." Fundamentals of Digital Marketing", Pearson, 2nd edition, 2019.
7. Kotler, Philip "Marketing 4.0: Moving from Traditional to Digital", Wiley, 1st edition, 2017.