

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING****Detailed Syllabus – BR20****For UG - B.Tech: Computer Science and Engineering****IV Year I Semester**

S.No	Course Code	Courses	L	T	P	Credits
1	20CS7D09 20CS7D10 20CS7D11 20CS7D12	<b>Professional Elective -III</b> 1. Cryptography and Network Security 2. Neural Networks 3. Ad-hoc and Sensor Networks 4. Cyber Security & Forensics/ <b>MOOCs-3</b>	3	0	0	3
2	20CS7D13 20CS7D14 20CS7D15 20CS7D16	<b>Professional Elective -IV</b> 1. Software Testing Methodologies 2. Deep Learning Techniques 3. Social Networks & Semantic Web 4. Computer Vision	3	0	0	3
3	20CS7D17 20CS7D18 20CS7D19 20CS7D20	<b>Professional Elective -V</b> 1. Mobile Computing 2. Block-Chain Technologies 3. Wireless Network Security 4. Ethical Hacking	3	0	0	3
4	20CS7E04 20CE7E03 20EC7E03 20EE7E03	<b>Open Elective -III</b> 1. Nature Inspired Computing Techniques 2. Disaster Management 3. Embedded Systems 4. Electrical Distribution Systems	2	0	2	3
5	20CS7E05 20EC7E04 20ME7E04 20CE7E04	<b>Open Elective- IV</b> 1. Secure Coding Techniques 2. 5G Communications 3. 3D Printing Technologies 4. Project Management	2	0	2	3
6	20HS7E01	<b>Humanity and Social Science Elective</b> 1.Resource Management 2. Industrial Management 3. Management Science 4. IPR and Patents	3	0	0	3
7	20HS7S01	English for Employability	1	0	2	2
8	20CS7P02	Industrial/Research Internship 2 months after III_II Evaluated during IV_I	0	0	6	3
<b>Total</b>			17	0	6	23



IV Year - I Semester	Code: 20CS7D09	L	T	P	C
		3	0	0	3
<b>CRYPTOGRAPHY AND NETWORK SECURITY</b>					
<b>Course Outcomes:</b> By the end of the course the student <ul style="list-style-type: none"><li>✓ Identify information security goals, classical encryption techniques</li><li>✓ Compare and apply different encryption and decryption techniques</li><li>✓ Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms</li><li>✓ Apply different digital signature algorithms to achieve authentication</li><li>✓ Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP</li></ul>					
<b>UNIT I</b> <b>Introduction: Elements of Information security</b> , Security attacks, services & mechanisms, A model of network security, Symmetric Cipher Model, Substitution Techniques, Transportation Techniques, Steganography					
<b>UNIT II</b> <b>Block Ciphers &amp; Symmetric Key Cryptography</b> Traditional Block Cipher Structure, Block Cipher Design Principles, Data Encryption Standard, AES-Structure, Transformation functions, Key Expansion.					
<b>UNIT III</b> <b>Number Theory:</b> Prime and Relatively Prime Numbers, Modular Arithmetic, Fermat's and Euler's Theorems, The Chinese Remainder theorem. <b>Public Key Cryptography:</b> Principles, public key cryptography algorithms, RSA Algorithms, Diffie Hellman Key Exchange, Elgamal encryption & decryption.					
<b>UNIT IV</b> <b>Cryptographic Hash Functions &amp; Digital Signatures</b> Application of Cryptographic hash Functions, Requirements & Security, Secure Hash Algorithm, Message Authentication Functions, Requirements & Security, and HMAC & CMAC. Digital Signatures, NIST Digital Signature Algorithm. Key management & distribution.					
<b>UNIT V</b> <b>Transport Level Security:</b> Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Shell (SSH), <b>Electronic Mail Security:</b> Pretty Good Privacy (PGP) and S/MIME. <b>Security:</b> IP Security Overview, IP Security Architecture.					
<b>Text Books:</b> <ol style="list-style-type: none"><li>1. Cryptography &amp; Network Security: Principles and Practices, William Stallings, PEA, Sixth edition.</li><li>2. Introduction to Computer Networks &amp; Cyber Security, Chwan Hwa Wu, J.David Irwin, CRC press</li></ol>					
<b>Reference Books:</b> <ol style="list-style-type: none"><li>1. Everyday Cryptography, Fundamental Principles &amp; Applications, Keith Martin, Oxford</li><li>2. Network Security &amp; Cryptography, Bernard Menezes, Cengage, 2010</li></ol>					



IV Year - I Semester	Code: 20CS7D10	L	T	P	C
		3	0	0	3
<b>NEURAL NETWORKS</b>					
<b>Course Outcomes:</b> <ul style="list-style-type: none"><li>✓ Understanding the alternative paradigm of conventional computing by machines called neural computing. This subject covers from basic neuron model to complex models, their learning algorithms and their applications.</li><li>✓ Explore learning processes in neural networks</li><li>✓ Illustrate single layer and multilayer neural networks.</li><li>✓ Illustrate recurrent neural networks.</li></ul>					
<b>UNIT I</b> <b>INTRODUCTION</b> - What is neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks <b>LEARNING PROCESS</b> – Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process					
<b>UNIT II</b> <b>SINGLE LAYER PERCEPTRONS</b> – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perceptron –convergence theorem, Relation between perceptron and Bayes classifier for a Gaussian Environment					
<b>UNIT III</b> <b>MULTILAYER PERCEPTRON</b> – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection, <b>BACK PROPAGATION</b> - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning.					
<b>UNIT IV</b> <b>SELF ORGANIZATION MAPS</b> – Two basic feature mapping models, Self Organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive patter classification					
<b>UNIT V</b> Chapter objectives: <b>RECURRENT NW</b> , Architecture, Hopfield Network and Boltzman Machine, Statistical Hopfield Network, Associative Memory, Bidirectional Associative Memory, Temporal Associative Memory, Linear Associative Memory.					
<b>Text Books:</b> <ol style="list-style-type: none"><li>1. Jacek M. Zurada, <b>Introduction to Artificial Neural Systems</b>, PWS Publishing Company, 1995.</li><li>2. Gunamani Jena, R.B Singh, An Introductory Course on Artificial Neural Networks, Kindle Edition, Amazon.</li><li>3. Simon Haykin, Neural Networks: A Comprehensive Foundation, Macmillan College Publishing Company, 1994.</li></ol>					
<b>Reference Books:</b> <ol style="list-style-type: none"><li>1. Laurene Fausett, Fundamentals of Neural Networks: Architectures, Algorithms, and Applications, Prentice Hall International, Inc., 1994.</li><li>2. B. D. Ripley, Pattern Recognition and Neural Networks, Cambridge University Press., 1996</li><li>3. Mohamad H. Hassoun, Fundamentals of Artificial Neural Networks, The MIT Press, 1995.</li></ol>					



IV Year - I Semester	Code: 20CS7D11	L	T	P	C
		3	0	0	3
<b>ADHOC AND SENSOR NETWORKS</b>					
<b>Course Outcomes:</b> By the end of the course the student <ul style="list-style-type: none"><li>➤ Able to think and develop new applications in Manets and WSN.</li><li>➤ Able to take any new technical issue related to these new thrust areas and come up with a solution(s).</li><li>➤ Able to develop algorithms/protocols for Manets and WSN.</li><li>➤ Understand the issues and solutions of various layers of Manets, namely MAC layer, Network Layer &amp; Transport Layer in Manets and WSN.</li><li>➤ Understand the issues in <i>Security and Sensor Network and Tools</i>.</li></ul>					
<b>UNIT I</b> Introduction to Ad Hoc Networks: Characteristics of MANETs, applications of MANETs, and challenges of MANETs. Routing in MANETs: Criteria for classification, Taxonomy of MANET routing algorithms, Topology based routing algorithms, Position based routing algorithms,					
<b>UNIT II</b> Data Transmission: Broadcast storm problem, Broadcasting, Multicasting and Geo casting					
<b>UNIT III</b> TCP over Ad Hoc: TCP protocol overview, TCP and MANETs, and Solutions for TCP over Ad hoc networks.					
<b>UNIT IV</b> Basics of Wireless Sensors and Applications: Applications, Classification of sensor networks, Architecture of sensor networks, Physical layer, MAC layer, Link layer.					
<b>UNIT V</b> Security: Security in ad hoc networks, Key management, Secure routing, Cooperation in MANETs, and Intrusion detection systems.					
<b>Text Books:</b> <ol style="list-style-type: none"><li>1. Ad hoc and Sensor Networks - Theory and Applications, by Carlos Cordeiro and Dharma P. Agrawal, World Scientific Publications, March 2006, ISBN 981-256-681-3.</li><li>2. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science ISBN: 978-1-55860-914-3, (Morgan Kaufman)</li></ol>					
<b>Reference Books:</b> <ol style="list-style-type: none"><li>1. AD HOC AND SENSOR NETWORKS: THEORY AND APPLICATIONS 2ND EDITION, KINDLE EDITION</li></ol>					



IV Year - I Semester	Code: 20CS7D12	L	T	P	C
		3	0	0	3
<b>CYBER SECURITY &amp; FORENSICS</b>					
<b>Course Outcomes:</b> By the end of the course the student <ul style="list-style-type: none"><li>➤ Able to explain about cyber crime</li><li>➤ Able to illustrate cyber offences.</li><li>➤ Able to describe cyber crime.</li><li>➤ Able to demonstrate tools and methods used in cyber crime.</li></ul>					
<b>UNIT I</b> Introduction to Cybercrime: Introduction, Cyber crime and Information Security, Who are Cybercriminals, Classifications of Cybercrimes, Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes.					
<b>UNIT II</b> Cyber Offenses: How Criminals Plan Them: Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector, Cloud Computing.					
<b>UNIT III</b> Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones.					
<b>UNIT IV</b> Tools and Methods Used in Cybercrime: Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan Horse and Backdoors, Steganography, DoS and DDoS attacks, SQL Injection, Buffer Overflow					
<b>UNIT V</b> Cyber Security: Organizational Implications, Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy Implications, Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations.					
<b>Text Books:</b> 1.Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA					
<b>Reference Books:</b> 1. CYBER SECURITY ESSENTIALS, JAMES GRAHAM, RICHARD HOWARD AND RYAN OTSON, CRC PRESS. 2. INTRODUCTION TO CYBER SECURITY, CHWAN-HWA (JOHN) WU, J. DAVID IRWIN. CRC PRESS T&F GROUP					



IV Year - I Semester	Code : 20CS7D13	L	T	P	C
		3	0	0	3
<b>SOFTWARE TESTING METHODOLOGIES</b>					
<b>Course Objectives:</b> <ol style="list-style-type: none"><li>1. To study the fundamental concepts of software testing which includes objectives, process, criteria, strategies, and methods.</li><li>2. To discuss various software testing types and levels of testing like black and white box testing along with levels unit test, integration, regression, and system testing.</li><li>3. It also helps to learn the types of bugs, testing levels with which the student can very well identify a bug and correct as when it happens.</li></ol>					
<b>Course Outcomes:</b> <ol style="list-style-type: none"><li>1. Know the basic concepts of software testing and its essentials.</li><li>2. Able to identify the various bugs and correcting them after knowing the consequences of the bug.</li><li>3. Use of program's control flow as a structural model is the corner stone of testing.</li><li>4. Performing functional testing using control flow and transaction flow graphs.</li></ol>					
<b>UNIT I</b> Introduction:-Purpose of testing, Dichotomies,model for testing, consequences of bugs, taxonomy of bugs, Flow graphs and Path testing:- Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.					
<b>UNIT II</b> Transaction Flow Testing:-transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.					
<b>UNIT III</b> Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.					
<b>UNIT IV</b> Paths, Path products and Regular expressions:- path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. Logic Based Testing:-overview, decision tables, path expressions, kv charts, specifications.					
<b>UNIT V</b> State, State Graphs and Transition testing:- state graphs, good & bad state graphs, state testing, Testability tips. Graph Matrices and Application:-Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools					
<b>Text Books:</b> <ol style="list-style-type: none"><li>1. Software Testing techniques – Boris Beizer, Dreamtech, second edition.</li><li>2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.</li></ol>					
<b>Reference Books:</b> <ol style="list-style-type: none"><li>1. The craft of software testing – Brian Marick, Pearson Education.</li><li>2. Software Testing Techniques – SPD(Oreille)</li><li>3. Software Testing in the Real World – Edward Kit, Pearson.</li><li>4. Effective methods of Software Testing, Perry, John Wiley.</li><li>5. Art of Software Testing – Meyers, John Wiley.</li></ol>					



IV Year - I Semester	Code: 20CS7D14	L	T	P	C
		3	0	0	3
<b>DEEP LEARNING TECHNIQUES</b>					
<b>Course Objectives:</b> <ul style="list-style-type: none"><li>➤ Demonstrate the major technology trends driving Deep Learning</li><li>➤ Build, train and apply fully connected deep neural networks</li><li>➤ Implement efficient (vectorized) neural networks</li><li>➤ Analyze the key parameters and hyper parameters in a neural network's architecture</li></ul>					
<b>Course Outcomes:</b> <ul style="list-style-type: none"><li>➤ Demonstrate the mathematical foundation of neural network</li><li>➤ Describe the machine learning basics</li><li>➤ Differentiate architecture of deep neural network</li><li>➤ Build a convolutional neural network</li><li>➤ Build and train RNN and LSTMs</li></ul>					
<b>UNIT I</b> Linear Algebra: Scalars, Vectors, Matrices and Tensors, Matrix operations, types of matrices, Norms, Eigen decomposition, Singular Value Decomposition, Principal Components Analysis. Probability and Information Theory: Random Variables, Probability Distributions, Marginal Probability, Conditional Probability, Expectation, Variance and Covariance, Bayes' Rule, Information Theory. Numerical Computation: Overflow and Underflow, Gradient-Based Optimization, Constrained Optimization, Linear Least Squares.					
<b>UNIT II</b> Machine Learning: Basics and Under fitting, Hyper parameters and Validation Sets, Estimators, Bias and Variance, Maximum Likelihood, Bayesian Statistics, Supervised and Unsupervised Learning, Stochastic Gradient Descent, Challenges Motivating Deep Learning. Deep Feed forward Networks: Learning XOR, Gradient-Based Learning, Hidden Units, Architecture Design, Back-Propagation and other Differentiation Algorithms.					
<b>UNIT III</b> Regularization for Deep Learning: Parameter Norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under-Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised Learning, Multi-Task Learning, Early Stopping, Parameter Tying and Parameter Sharing, Sparse Representations, Bagging and Other Ensemble Methods, Dropout, Adversarial Training, Tangent Distance, Tangent Prop and Manifold Tangent Classifier. Optimization for Training Deep Models					
<b>UNIT IV</b> Convolutional Networks: The Convolution Operation, Pooling, Convolution, Basic Convolution Functions, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features, Basis for Convolutional Networks.					
<b>UNIT V</b> Sequence Modeling: Recurrent and Recursive Nets: Unfolding Computational Graphs, Recurrent Neural Networks, Bidirectional RNNs, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks, Echo State Networks, LSTM, Gated RNNs, Optimization for Long-Term Dependencies, Auto encoders, Deep Generative Models.					
<b>Text Books:</b> <ol style="list-style-type: none"><li>1) Ian Goodfellow, Yoshua Bengio, Aaron Courville, "Deep Learning", MIT Press, 2016.</li><li>2) Josh Patterson and Adam Gibson,</li></ol>					
<b>Reference Books:</b> <ol style="list-style-type: none"><li>1) Fundamentals of Deep Learning, Designing next-generation machine intelligence algorithms, Nikhil Buduma, O'Reilly, Shroff Publishers, 2019.</li><li>2) Deep learning Cook Book, Practical recipes to get started Quickly, Douwe Osinga, O'Reilly, Shroff Publishers, 2019.</li></ol>					



IV Year - I Semester	Code: 20CS7D15	L	T	P	C
		3	0	0	3
<b>SOCIAL NETWORKS &amp; SEMANTIC WEB</b>					
<b>Course Outcomes:</b> <ul style="list-style-type: none"><li>➤ Ability to understand and knowledge representation for the semantic web.</li><li>➤ Ability to create ontology</li><li>➤ Ability to build a blogs and social networks</li></ul>					
<b>UNIT I</b> Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today’s Web, The Next Generation Web. Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.					
<b>UNIT II</b> Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL),UML/XML/XML Schema. Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.					
<b>UNIT III</b> Logic, Rule and Inference Engines. Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base.					
<b>UNIT IV</b> XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods, What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks.					
<b>UNIT V</b> Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.					
<b>Text Books:</b> <ol style="list-style-type: none"><li>1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley interscience.</li><li>2. Social Networks and the Semantic Web, Peter Mika, Springer.</li></ol>					
<b>Reference Books:</b> <ol style="list-style-type: none"><li>1. Semantic Web Technologies, Trends And Research In Ontology Based Systems, J. Davies, Rudi Studer, Paul Warren, John Wiley &amp; Sons.</li><li>2. Information Sharing On The Semantic Web - Heiner Stucken Schmidt; Frank Van Harmelen, Springer Publications.</li><li>3. Programming The Semantic Web, T. Segaran, C. Evans, J. Taylor, O’reilly, Spd.</li></ol>					





IV Year - I Semester	Code: 20CS7D16	L	T	P	C
		3	0	0	3
<b>COMPUTER VISION</b>					
<b>Course Objectives:</b> To introduce students the fundamentals of image formation; To introduce students the major ideas, methods, and techniques of computer vision and pattern recognition; To develop an appreciation for various issues in the design of computer vision and object recognition systems; and To provide the student with programming experience from implementing computer vision and object recognition applications					
<b>Course Outcomes:</b> After completing the course Student will be able to: <ol style="list-style-type: none"><li>1. Identify basic concepts, terminology, theories, models and methods in the field of computer vision,</li><li>2. Describe known principles of feature detection and matching,</li><li>3. Describe basic methods of computer vision related to image stitching, photography like high dynamic range imaging and blur removal.</li><li>4. Suggest a design of a computer vision system for a 3D Reconstruction, Albedos, image based rendering views and depths</li></ol>					
<b>UNIT I</b> <b>Introduction:</b> Image Formation: Geometric Primitives and Transformation, Photometric Image Formation, Digital Camera, Image Processing: Point Operators, Linear Filtering, More Neighborhood Operators, Fourier Transforms, Pyramids and Wavelets, Geometric Transformations, Global Optimization.					
<b>UNIT II</b> <b>Feature Detection and Matching:</b> Points and Patches, Edges, Lines, Segmentation: Active Contours, Split and Merge, Mean Shift and Mode Finding, Normalized Cuts, Feature-Based Alignment: 2D and 3D Feature-based Alignment, Pose Estimation, Geometric Intrinsic Calibration.					
<b>UNIT III</b> <b>Structure and Motion:</b> Triangular, Two-frame Structure from Motion, Factorization, Bundle Adjustment, Constrained Structure and Motion, Dense Motion Estimation: Translation Alignment, Parametric Motion, Spline-based Motion, Optical Flow, Layered motion.					
<b>UNIT IV</b> <b>Image Stitching:</b> Motion Models, Global Alignment, Composing, Computational Photography: Photometric Calibration, High Dynamic Range Imaging, Super-Resolution and Blur Removal, image Matting and Compositing, Texture Analysis and Synthesis.					
<b>UNIT V</b> <b>3D Reconstruction:</b> Shape From X, Active Range Finding, Surface Representation, Point-based Representation, Volumetric Representation, Model-based Reconstruction, Recovering Texture Maps and Albedos, Image-based Rendering: View Interpolation, Layered Depth Images, Light Fields and Lumigraphs, Environment Mattes, Video-based Rendering.					
<b>Text Books:</b> <ol style="list-style-type: none"><li>1. Richard Szeliski, Computer Vision: Algorithms and Applications, Springer-Verlag London Limited, 2011.</li><li>2. Simon J.D Prince, Computer Vision: Models, Learning and Inference, 1<sup>st</sup> Edition, 2012.</li></ol>					
<b>Reference Books:</b> <ol style="list-style-type: none"><li>1. Computer Vision - A modern approach, by D. Forsyth and J. Ponce, Prentice Hall Robot Vision, by B. K. P. Horn, McGraw-Hill.</li><li>2. Haralick &amp; Shapiro, "Computer and Robot Vision", Vol II</li></ol>					



IV YEAR I SEM	Code : 20CS7D17	L	T	P	C
		3	0	0	3
<b>MOBILE COMPUTING</b>					
<b>Course Objectives:</b> <ol style="list-style-type: none"><li>4. Define mobile technologies in terms of hardware, software, and communications.</li><li>5. Utilize mobile computing nomenclature to describe and analyze existing mobile computing frameworks and architectures.</li><li>6. Evaluate the effectiveness of different mobile computing frameworks.</li></ol>					
<b>Course Outcomes:</b> <ol style="list-style-type: none"><li>1. Define mobile technologies in terms of hardware, software, and communications.</li><li>2. Utilize mobile computing nomenclature to describe and analyze existing mobile computing frameworks and architectures in Medium Access Control</li><li>3. Utilize mobile computing nomenclature to describe and analyze existing mobile computing frameworks and architectures in Mobile Network Layer</li></ol>					
<b>UNIT I</b> Introduction: Mobile Communications, Mobile Computing-Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Hand held Devices, Limitations of Mobile and Hand held Devices. GSM-Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Hand over, Security, New Data Services, GPRS.					
<b>UNIT II</b> (Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA.TDMA, CDMA, Wireless LAN/(IEEE802.11).					
<b>UNIT III</b> <b>Mobile Network Layer:</b> IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.					
<b>UNIT IV</b> <b>Mobile Transport Layer:</b> Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks. <b>Database Issues:</b> Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.					
<b>UNIT V</b> <b>Data Dissemination and Synchronization:</b> Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization Introduction, Software, and Protocols					
<b>Text Books:</b> <ol style="list-style-type: none"><li>1. JochenSchiller, "MobileCommunications, Addison-Wesley SecondEdition, 2009.</li><li>2. RajKamal."MobileComputing" Oxford University Press, 2007 ISBN:0195686772</li></ol>					
<b>Reference Books:</b> ASOKE K TALUKDER, HASAN AHMED. ROOPA RYAVAGAL. "Mobile Computing. Technology Applications and Service Creation" Second Edition. McGraw Hill. UWE Hansmann, Lothar Merk, Martin S. Nocklous, Thomas Stober, "Principles of Mobile Computing", Second Edition, Springer.					



IV Year - I Semester	Code: 20CS7D18	L	T	P	C
		3	0	0	3
<b>BLOCKCHAIN TECHNOLOGIES</b>					
<b>Course Objectives:</b> By the end of the course, students will be able to <input type="checkbox"/> Understand how block chain systems (mainly Bit coin and Ethereum) work and to securely interact with them, <input type="checkbox"/> Design, build, and deploy smart contracts and distributed applications, <input type="checkbox"/> Integrate ideas from block chain technology into their own projects.					
<b>Course Outcomes:</b> At the end of the course, student will be able to <input type="checkbox"/> Demonstrate the foundation of the Block chain technology and understand the processes in payment and funding. <input type="checkbox"/> Identify the risks involved in building Block chain applications. <input type="checkbox"/> Review of legal implications using smart contracts.					
<b>UNIT I</b> Introduction, Scenarios, Challenges Articulated, Blockchain, Blockchain Characteristics, Opportunities Using Blockchain, History of Blockchain. Evolution of Blockchain : Evolution of Computer Applications, Centralized Applications, Decentralized Applications, Stages in Blockchain Evolution, Consortia, Forks, Public Blockchain Environments, Type of Players in Blockchain Ecosystem, Players in Market.					
<b>UNIT II</b> Blockchain Concepts: Introduction, Changing of Blocks, Hashing, Merkle-Tree, Consensus, Mining and Finalizing Blocks, Currency aka tokens, security on blockchain, data storage on blockchain, wallets, coding on blockchain: smart contracts, peer-to-peer network, types of blockchain nodes, risk associated with blockchain solutions, life cycle of blockchain transaction.					
<b>UNIT III</b> Architecting Blockchain solutions: Introduction, Obstacles for Use of Blockchain, Blockchain Relevance Evaluation Framework, Blockchain Solutions Reference Architecture, and Types of Blockchain Applications. Cryptographic Tokens, Typical Solution Architecture for Enterprise Use Cases, Types of Blockchain Solutions, Architecture Considerations, Architecture with Blockchain Platforms, Approach for Designing Blockchain Applications.					
<b>UNIT IV</b> Ethereum Blockchain Implementation: Introduction, Tuna Fish Tracking Use Case, Ethereum Ecosystem, Ethereum Development, Ethereum Tool Stack, Ethereum Virtual Machine, Smart Contract Programming, Integrated Development Environment, Truffle Framework, Ganache, Unit Testing, Ethereum Accounts, MyEtherWallet, Ethereum Networks/Environments, Infura, Etherscan, Ethereum Clients, Decentralized Application, Metamask, Tuna Fish Use Case Implementation, OpenZeppelin Contracts					
<b>UNIT V</b> Hyperledger Blockchain Implementation, Introduction, Use Case – Car Ownership Tracking, Hyperledger Fabric, Hyperledger Fabric Transaction Flow, FabCar Use Case Implementation, Invoking Chaincode Functions Using Client Application.					
<b>Text Books:</b> 1) Ambadas, Arshad Sarfarz Ariff, Sham “Blockchain for Enterprise Application Developers”, Wiley 2) Andreas M. Antonopoulos, “Mastering Bitcoin: Programming the Open Blockchain”, O’Reilly					
<b>Reference Books:</b> 1) Blockchain: A Practical Guide to Developing Business, Law, and Technology Solutions, Joseph Bambara, Paul R. Allen, Mc Graw Hill. 2) Blockchain: Blueprint for a New Economy, Melanie Swan, O’Reilly					



IV Year - I Semester	Code: 20CS7D19	L	T	P	C
		3	0	0	3
<b>WIRELESS NETWORK SECURITY</b>					
<b>Course Outcomes:</b> At the end of the course, students will be able to 1. Comprehend the fundamental concepts of mobile and wireless network security 2. Identify security threats in wireless networks and design strategies to manage network security 3. Design secured network application considering all possible threats					
<b>UNIT I</b> Security in General Wireless/Mobile Networks: High Performance Elliptic Curve Cryptographic Co-processor, An Adaptive Encryption Protocol in Mobile Computing					
<b>UNIT II</b> Security in Wireless LANs: Cross Domain Mobility Adaptive Authentication, AAA Architecture and Authentication for wireless LAN Roaming, Experimental Study on Security Protocols in WLANs					
<b>UNIT III</b> Security in Ad Hoc Networks: Pre-authentication and authentication models in Ad Hoc Networks, Promoting Identity-based key management, attacks and countermeasures, Secure and resilient data aggregation, Secure routing in MANET, Intrusion Detection System in MANET					
<b>UNIT IV</b> Security in Mobile Cellular Networks: Security issues in GSM, 3G and 4G networks, Authentication and encryption, Security concerns in 5G networks					
<b>UNIT V</b> Security in Sensor Networks and IoT: Security Issues, Key Management Schemes, Secure Routing in Sensor Networks, Energy-aware security mechanisms, Security and privacy issues in IoT, Identity and access management, Data Integrity, Best practices for IoT security					
<b>Text Books:</b> 1. Y. Xiao, X. Shen, D. Z.Du, Wireless Network Security, Springer International Edition. 2. Lei Chen, Jiahuang Ji, Zihong Zhang, Wireless Network Security, Springer Science & Business Media 3. W. Stallings. Cryptography & Network Security: Principles and Practice, Prentice Hall 4. Nouredine Boudriga, Security of Mobile Communications, CRC Press 5. Levente Buttyán and Jean-Pierre Hubaux, Security and Cooperation in Wireless Networks, Cambridge University Press					
<b>Reference Books:</b> 1. James Kempf, Wireless Internet Security: Architectures And Protocols, Cambridge University Press 2. Patrick Traynor, Patrick Mcdaniel, And Thomas La Porta, Security For Telecommunications Networks, Springer					



IV Year - I Semester	Code: 20CS7D20	L	T	P	C
		3	0	0	3
<b>ETHICAL HACKING</b>					
<b>Course Outcomes:</b> <ul style="list-style-type: none"><li>➤ Gain the knowledge of the use and availability of tools to support an ethical hack</li><li>➤ Gain the knowledge of interpreting the results of a controlled attack</li><li>➤ Understand the role of politics, inherent and imposed limitations and metrics for planning of a test</li><li>➤ Comprehend the dangers associated with penetration testing</li></ul>					
<b>UNIT I</b> <b>Introduction:</b> Hacking Impacts, The Hacker Framework: Planning the test, Sound Operations, Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Final Analysis, Deliverable, Integration. <b>Information Security Models:</b> Computer Security, Network Security, Service Security, Application Security, Security Architecture. <b>Information Security Program:</b> The Process of Information Security, Component Parts of Information Security Program, Risk Analysis and Ethical Hacking					
<b>UNIT II</b> Planning for a Controlled Attack: Inherent Limitations, Imposed Limitations, Timing is Everything, Attack Type, Source Point, Required Knowledge, Multi-Phased Attacks, Teaming and Attack Structure					
<b>UNIT III</b> Preparing for a Hack: Technical Preparation, Managing the Engagement Reconnaissance: Social Engineering, Physical Security, Internet Reconnaissance					
<b>UNIT IV</b> <b>Enumeration:</b> Enumeration Techniques, Soft Objective, Looking Around or Attack, Elements of Enumeration, Preparing for the Next Phase. <b>Exploitation:</b> Intuitive Testing, Evasion, Threads and Groups, Operating Systems, Password Crackers, RootKits, applications, Wardialing, Network, Services and Areas of Concern					
<b>UNIT V</b> <b>Deliverable:</b> The Deliverable, The Document, Overall Structure, Aligning Findings, Presentation <b>Integration:</b> Integrating the Results, Integration Summary, Mitigation, Defense Planning, Incident Management, Security Policy, Conclusion					
<b>Text Books:</b> 1. James S. Tiller, “The Ethical Hack: A Framework for Business Value Penetration Testing”, Auerbach Publications, CRC Press					
<b>Reference Books:</b> 1. EC-COUNCIL, “ETHICAL HACKING AND COUNTERMEASURES ATTACK PHASES”, CENGAGE LEARNING 2. MICHAEL SIMPSON, KENT BACKMAN, JAMES CORLEY, “HANDS-ON ETHICAL HACKING AND NETWORK DEFENSE”, CENGAGE LEARNING					



IV Year - I Semester	Code: 20CS7E04	L	T	P	C
		3	0	0	3
<b>NATURE INSPIRED COMPUTING TECHNIQUES</b>					
<b>Course Objectives:</b> Learn the theoretical foundations of Nature Inspired Computing techniques, how they can be used to solve problems, and in which areas are most useful and effective.					
<b>Course Outcomes:</b> By completing the course the students will be able to: <ul style="list-style-type: none"><li>• Understand the strengths, weaknesses and appropriateness of nature-inspired algorithms.</li><li>• Apply nature-inspired algorithms to optimization, design and learning problems.</li></ul>					
<b>UNIT I</b> <b>Analysis of Algorithms:</b> Analysis of Optimization Algorithms, Nature Inspired Algorithms, Parameter Tuning and Parameter Control: Parameter Tuning, Hyper optimization, Multi objective View, Parameter Control, Simulated Annealing: Algorithm, Basic Convergence Properties, Stochastic Tunneling					
<b>UNIT II</b> <b>Genetic Algorithms:</b> Introduction, Role of Genetic Operators, Choice of Parameters, GA Variants, <b>Differential Evolution:</b> Introduction, Differential Evolution, Variants, Choice of Parameters, Convergence Analysis, <b>Particle Swarm Optimization:</b> Swarm Intelligence, PSO Algorithm, Accelerated PSO, Binary PSO					
<b>UNIT III</b> <b>Firefly Algorithms:</b> Firefly Behavior, Standard Firefly Algorithm Variations of Light Intensity and Attractiveness, Controlling Randomization, Firefly Algorithms in Applications <b>Cuckoo Search:</b> Cuckoo Breeding Behavior, Levy Flights, Cuckoo Search: Special Cases of Cuckoo Search, Variants of Cuckoo Search, Global Convergence, Applications					
<b>UNIT IV</b> <b>Bat Algorithms:</b> Echolocation of Bats: Behavior of Microbats, Acoustics of Echolocation, Bat Algorithms: Movement of Virtual Bats, Loudness and Pulse Emission, Binary Bat Algorithm, Variants of the Bat Algorithm, Convergence Analysis, Applications: Continuous Optimization, Combinatorial Optimization and Scheduling, Inverse Problems and Parameter Estimation, Classifications, Clustering and Data Mining, Image Processing, Fuzzy Logic and Other Applications					
<b>UNIT V</b> <b>Flower Pollination Algorithms:</b> Introduction, Characteristics of Flower Pollination, Flower Pollination Algorithms, Multi-Objective Flower Pollination Algorithms, Validation and Numerical Experiments: Single-Objective Test Functions, Multi-Objective Test Functions, Applications: Single-Objective Design Benchmarks, Multi-Objective Design Benchmarks					
<b>Text Books:</b> 1. “Nature-Inspired Optimization Algorithms”, Yang, Xin-She, Elsevier Science, 2014.					
<b>Reference Books:</b> 1. “Nature-Inspired Computing and Optimization: Theory and Applications,” Germany: Springer International Publishing, 2017.					



IV Year - I Semester	Code: 20CS7E05	L	T	P	C
		3	0	0	3
<b>SECURE CODING TECHNIQUES</b>					
<p><b>Course Outcomes:</b> At the end of the Course, student will be able to:</p> <ul style="list-style-type: none"> <li>• Differentiate the objectives of information security</li> <li>• Understand the trend, reasons and impact of the recent Cyber attacks</li> <li>• Understand OWASP design principles while designing a web application</li> <li>• Understand Threat modelling</li> <li>• Importance of security in all phases of SDLC</li> <li>• Write secure coding using some of the practices in C/C++/Java and Python programming languages</li> </ul>					
<p><b>UNIT I</b> <b>Network and Information security Fundamentals:</b> Network Basics, Network Components, Network Types, Network Communication Types, Introduction to Networking Models, Cyber Security Objectives and Services, Other Terms of Cyber Security, Myths Around Cyber Security, Myths Around Cyber Security, Recent Cyber Attacks, Generic Conclusion about Attacks, Why and What is Cyber Security, Categories of Attack</p>					
<p><b>UNIT II</b> <b>Introduction to Cyber security:</b> Introduction to OWASP Top 10, A1 Injection, A1 Injection Risks Root Causes and its Mitigation, A1 Injection, A2 Broken Authentication and Session Management, A7 Cross Site Scripting XSS, A3 Sensitive Data Exposure, A5 Broken Access Control, A4 XML External Entity (XEE), A6 Security Misconfiguration, A7 Missing Function Level Access Control, A8 Cross Site Request Forgery CSRF, A8 Insecure Deserialization, A9 Using Components With Known Vulnerabilities, A10 Unvalidated Redirects and Forwards, A10 Insufficient Logging and Monitoring, Secure Coding Practices, Secure Design Principles, Threat Modeling, Microsoft SDL Tool</p>					
<p><b>UNIT III</b> <b>Secure coding practices and OWASP Top 10:</b> Declarative Security, Programmatic Security, Concurrency, Configuration, Cryptography, Input and Output Sanitization, Error Handling, Input Validation, Logging and auditing, Session Management, Exception Management, Safe APIs, Type Safety, Memory Management, Tokenizing, Sandboxing, Static and dynamic testing, vulnerability scanning and penetration testing</p>					
<p><b>UNIT IV</b> <b>Secure coding practices in C/C++ and Java:</b> Potential Software Risks in C/C++, Defensive coding, Preventative Planning, Clean Code, Iterative Design, Assertions, Pre Post Conditions, Low level design inspections, Unit Tests Java- Managing Denial of Service, Securing Information, Data Integrity, Accessibility and Extensibility, Securing Objects, Serialization Security</p>					
<p><b>UNIT V</b> <b>Secure coding in Python:</b> Interactive Python Scripting, Python Variables, Conditionals, Loops, Functions, External Modules, File operations, Web requests</p>					
<p><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>1. Networking Fundamentals, 2019 edition, Packt, Author: Gordon Davies</li> <li>2. Principles of Information Security, Authors: Michael E. Whitman and Herbert J. Mattord, Course technology incorp.</li> <li>3. CSSLP SECURE SOFTWARE LIFECYCLE PROFESSIONAL ALL-IN-ONE EXAM GUIDE, Third Edition, 3rd Edition, Authors: Wm. Arthur Conklin, Daniel Paul Shoemaker, Released February 2022, Publisher(s): McGraw-Hill, ISBN: 9781264258215</li> <li>4. OCP Oracle Certified Professional Java SE 11 Programmer II Study Guide: Exam 1Z0-816 and Exam 1Z0-817 Paperback – 6 August 2020, Authors: Scott Selikoff , Jeanne Boyarsky</li> <li>5. OWASP 2017 Handbook, <a href="https://owasp.org/www-pdf-archive/OWASP_Top_10_2017_RC2_Final.pdf">https://owasp.org/www-pdf-archive/OWASP_Top_10_2017_RC2_Final.pdf</a></li> </ol>					
<p><b>Web Reference :</b></p> <ol style="list-style-type: none"> <li>1. <a href="https://www.stealthlabs.com/blog/infographic-top-15-cybersecurity-myths-vs-reality/">https://www.stealthlabs.com/blog/infographic-top-15-cybersecurity-myths-vs-reality/</a></li> <li>2. <a href="https://microage.ca/cybersecurity-layering-approach/">https://microage.ca/cybersecurity-layering-approach/</a></li> <li>3. <a href="https://www.synopsys.com/glossary/what-is-threat-modeling.html#:~:text=Threat%20modeling%20is%20a%20structured,An%20abstraction%20of%20the%20system">https://www.synopsys.com/glossary/what-is-threat-modeling.html#:~:text=Threat%20modeling%20is%20a%20structured,An%20abstraction%20of%20the%20system</a></li> </ol>					



## RESOURCES MANAGEMENT

Course Code:20HS7E01 (IV-I)

### Elective-1

L	T	P	C
4	0	0	3

### Course Objectives:

**COB 1:** To make the students understand the importance of resources management and proper planning to effective utilization of resources in organization.

**COB 2:** To make the students understands the role of human relations in the management of operations and to Understands the marketing conditions, techniques for better business career.

**COB 3:** To impart knowledge on conceptual models of resources management and to familiarize with the tools of project management.

### Course Outcomes:

**At the end of the course, student will be able to:**

<b>CO 1:</b>	Explain the concepts and importance of resources management
<b>CO 2</b>	Use Human resource management techniques for optimum utilization Human Resource.
<b>CO 3:</b>	Estimate Material Requirement of organization through applications of it.
<b>CO 4:</b>	Apply statistical quality techniques to know quality ofproduct with in the control limits
<b>CO 5 :</b>	Apply the project management techniques to decide the optimum time and cost for the project completion

### Unit- I

**Introduction to resources Management:** Conceptdefinition to Management-types of recourse-advantages and importance of resources management-optimization process of resources -Evaluation of organizational resources-Environmental Scanning-Establishment strategic advantage profile in resources.

### Unit-2

**Human Resources Management;** Concept of HRM& HRD-Functions of HRM; job analysis , job description ,man power planning, selection, job evaluation and Merit rating –Marketing function-channels of distribution –product life cycle.

### Unit -3

**ManagementofMaterial Resources:** Introduction-importance-functions-economic orderquantity(EOQ)-sorting methods; ABC,HML,SDE,VED FSN analysis-contemporary methods (JIT, MRP,TQM,SIX SIGMAS,BPO).





### Unit-4

**Management of Operational resources;** Concept-Principals-work study-method study-Statistical quality control(R- chart, C- chart, P-chart) Accepting sampling

### Unit-5

**Project Management;** Introduction - importance- historical background PERT-Network analysis- rules of networking-critical path method-time estimations-project crashing (simple problems),

### **Text Books:**

1. Dr. A.R.Aryasri, Management Science, TMH, 4th edition, 2009
2. P. Vijaya kumar, N. Appa Rao, AB. Chhalill, Introduction to ManagemantScience,Cengage Learning India pvt ltd., Delhi.
3. O.P .Kanna,**Industrial Engineering And Management,Dhanpat Rai Publications(2010)**
4. Kootz&O'Donnell , Principles of management.

### **Reference Books:**

1. Koontz &weihrich – Essentials of management, TMH, 8 th edition, 2010
2. Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi.
3. R S Dwivedi, Human resource Management,Vikas Publishing House Pvt,ltd.,
- 4.Philip Kotler, K L keller, A koshy, M Jha, Marketing Management, 13Edition, Pearson
5. Pandey, Management Science, Standard Book



L	T	P	C
3	0	0	3

## INDUSTRIAL MANAGEMENT

Course Code:-20HS7E02

IVYEAR I SEMESTER

### Elective-2

#### Course Objectives:

**COB 1:** To impart fundamental knowledge and skill sets required in the Industrial Management and Engineering profession, which include the ability to apply basic knowledge of mathematics, probability and statistics, and the domain knowledge of Industrial Management and Engineering

**COB 2:** To produce graduates with the ability to adopt a system approach to design, develop, implement and innovate integrated systems that include people, materials, information, equipment and energy.

**COB 3:** To enable students to understand the interactions between engineering, business, technological and environmental spheres in the modern society.

**COB 4:** To enable students to understand their role as engineers and their impact to society at the national and global context.

#### Course Outcomes:

CO1: Able to **describe** concept of industrial engg and management and functions of management

CO2: Able to **contrast** the location factors of plants and different layouts used of an industry.

CO3. Able to **understand** work study , methods study and work measurement for improving productivity .

CO4. Able to **interpret** the SQC tools and TQM approach for improving the product quality.

CO5. Able to **apply** concept of Value engg and project management using CPM and PERT

#### UNIT – I

**INTRODUCTION:** Definition of industrial engineering (I.E), development, applications, role of an industrial engineer, Productivity and its measurement.

Concepts of management, importance, functions of management, Taylor's scientific management principles, Fayol's principles of management , Mc Douglas Theory X and theory

#### UNIT – II

**PLANT LAYOUT:** Factors governing plant location, types of production layouts, advantages and disadvantages of process layout and product layout, applications, quantitative techniques for optimal design of layouts, plant maintenance, preventive and breakdown maintenance.

#### UNIT – III

##### OPERATIONS MANAGEMENT:

production and its methods with applications. work study - method study- process charts and diagrams , micro-motion study and Therbligs. Work measurement – Stop Watch Time study, work sampling, PMTS, rating techniques. Principles of Ergonomics.

#### UNIT – IV

**STATISTICAL QUALITY CONTROL:** quality, quality control and SQC. inspection and its methods -

single and double sampling .Control charts for variables and attributes - $\bar{X}$  and R charts, P charts, C charts S charts and numerical examples.

**TOTAL QUALITY MANAGEMENT:** zero defect concept, quality circles, implementation, applications, six sigma – definition, basic concepts, ISO quality systems.



**UNIT – V**

**PROJECT MANAGEMENT:**

PERT and CPM – differences & applications, critical path, determination of floats, importance, project crashing, smoothing and numerical examples.

**TEXT BOOKS:**

1. Industrial Engineering and management / O.P Khanna/Khanna Publishers.
2. Industrial Engineering and Production Management/MartandTelsang/S.Chand& Company Ltd. New Delhi

**Reference Books:**

1. Industrial Management / Bhattacharya DK/Vikas publishers
2. Operations Management / J.G Monks/McGrawHill Publishers.
3. Industrial Engineering and Management Science/ T. R. Banga, S. C. Sharma, N. K. Agarwal/Khanna Publishers
4. Principles of Management /Koontz O' Donnel/McGraw Hill Publishers.
5. Statistical Quality Control /Gupta/Khanna Publishers
6. Industrial Engineering and Management /NVS Raju/Cengage Publishers



## MANAGEMENT SCIENCE

### Elective-3

Course Code: 20HS7E03(IV-I semester)	L	T	P	C
	4	0	0	3

#### Course Objectives:

**COB 1:** To make the students define the principles, functions, theories and practices of different management areas with a systematic and critical understanding of organizational structures.

**COB 2:** To make the students understands the role of human relations in the management of operations and to Understands the marketing conditions, techniques for better business career.

**COB 3:** To impart knowledge on conceptual models of strategic management and to familiarize with the tools of project management.

#### Course Outcomes:

At the end of the course, student will be able to:

CO 1:	Explain and infer the concepts and aspects of management
CO 2:	Apply statistical quality & inventory control techniques to know, quality of product with in the control limits
CO 3	Use Human resource management techniques for better people management.
CO 4:	Estimate Marketing and its applications.
CO 5:	Apply the project management techniques to decide the optimum time and cost for the project completion
CO 6 :	Analyzing Strategies which are suitable for the development of organization

#### Unit I: Introduction to Management:

Definition, Nature, Importance of Management, Functions of Management –

**Evaluation of Management thought** Taylor's scientific management theory, Fayol's principles of management, Contribution of Elton mayo, Theories of Motivation Maslow, Herzberg, Douglas MC Gregor.



**Basic concepts of Organization**-Authority, Responsibility, Delegation of Authority, Span of control, centralization Vs Decentralization, formal Vs informal organizations.

Organization structures - Line organization, Line and staff organization, Functional organization, Committee organization, Matrix organization, Decision making process.

### **Unit II: - Operations & Materials, Quality Control Management**

Plant location, Factors influencing location, Principles and types of plant layouts,

**Material Management:** Need for Inventory control, EOQ, ABC analysis (simple problems) and Types of ABC analysis.

### **Statistical Quality Control:**

Statistical Quality Control, acceptance sampling, Control charts P-chart, X chart, R-chart, and C-chart Simple problems, TQM, Six Sigma, JIT, KPO.

### **Unit III: - Human Resource & Marketing Management:**

Concepts of HRM, HRD, Basic functions of HR manager, Recruitment, Selection, Training, performance appraisal, Talent management - Stress management. Marketing Management and its Marketing mix- Market segmentation - product life cycle- Channels of Distribution.

### **Unit IV: - Project Management:**

Network analysis: Networking rules - Critical path method (CPM) - Programme evaluation and review technique (PERT), project crashing (simple problems)

### **Unit V: Strategic Management:**

Vision, Mission, Goals, Strategy, Elements of Corporate Planning Process, Environmental Scanning (SWOT analysis), Steps in Strategy Formulation and Implementation,

### **Text Books:**

1. Dr. A.R.Aryasri, Management Science, TMH, 4th edition, 2009
2. P. Vijaya kumar, N. Appa Rao, AB. Chhalill, Introduction to Management Science, Cengage Learning India pvt ltd., Delhi.
3. O.P .Kanna, Industrial Engineering And Management, Dhanpat Rai Publications (2010)
4. Kootz & O'Donnell , Principles of management.

### **Reference Books:**

1. Koontz & wehrich – Essentials of management, TMH, 8 th edition, 2010
2. Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi.
3. R S Dwivedi , Human resource Management, Vikas Publishing House Pvt,ltd.,
4. Philip Kotler, K L keller, A koshy, M Jha, Marketing Management, 13Edition, Pearson
5. Pandey, Management Science, Standard Book



## **IPR & PATENTS**

**IV Year I Semester Subject Code:20HS7E04**

### **UNIT I**

Introduction to Intellectual Property Rights (IPR): Concept of Property - Introduction to IPR International Instruments and IPR - WIPO-TRIPS-WTO-Laws Relating to IPR - IPR Tool Kit- Protection and Regulation - Copyrights and Neighboring Rights Industrial Property Patents- Agencies for IPR Registration - Traditional Knowledge-Emerging Areas of IPR Layout Designs and Integrated Circuits - Use and Misuse of Intellectual Property Rights.

### **UNIT II**

Copyrights and Neighboring Rights: Introduction to Copyrights - Principles of Copyright Protection Law Relating to Copyrights - Subject Matters of Copyright Copyright



Ownership Transfer and Duration - Right to Prepare Derivative Works-Rights of Distribution - Rights of Performers-Copyright Registration-Limitations-Infringement of Copyright-Relief and Remedy -Case Law - Semiconductor Chip Protection Act.

### UNIT III

Patents: Introduction to Patents - Laws Relating to Patents in India - Patent Requirements - Product Patent and Process Patent - Patent Search - Patent Registration and Granting of Patent - Exclusive Rights-Limitations - Ownership and Transfer-Revocation of Patent-Patent Appellate Board - Infringement of Patent-Compulsory Licensing Patent Cooperation Treaty - New developments in Patents Software Protection and Computer related Innovations

### UNIT IV

Trademarks: Introduction to Trademarks- Laws Relating to Trademarks - Functions of Trademark- Distinction between Trademark and Property Mark-Marks Covered under Trademark Law - Trade Mark Registration - Trade Mark Maintenance Transfer of rights-Deceptive Similarities Likelihood of Confusion - Dilution of Ownership-Trademarks Claims and Infringement-Remedies-Passing Off Action.

### UNIT V

Trade Secrets & Cyber Law and Cyber Crime: Introduction to Trade Secrets-General Principles -Laws Relating to Trade Secrets- Maintaining Trade Secret Physical Security - Employee Access Limitation-Employee Confidentiality Agreements Breach of Contract-Law of Unfair Competition Trade Secret Litigation Applying State Law. Cyber Law-Information Technology Act 2000-Protection of Online and Computer Transactions- E-commerce-Data Security-Authentication and Confidentiality - Privacy Digital Signatures -Certifying Authorities - Cyber Crimes - Prevention and Punishment-Liability of Network Providers

### Text Books:-

- 1) Deborah E.Bouchoux: Intellectual Property, Cengage Learning, NewDelhi
- 2) Kompal Bansal &Parishit Bansal Fundamentals of IPR for Engineers, B. S. Publications (Press).

### References:

- 1) Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press,New Delhi.
- 2)PrabhuddhaGanguli: Intellectual Property Rights, Tata Mc-Graw-Hill, New Delhi

## ENGLISH FOR EMPLOYABILITY

(Common to all branches)

Course Code : 20HS7S01

L	T	P	C
1	0	2	2

### Course Objectives:

- COB 1: Imbibe the ability to understand and interpret unspoken gestures from others.
- COB 2: To present the point of view effectively and support the arguments of the topic
- COB 3: Learn to speak and interrupt politely by concluding with a positive discussion.
- COB. 4: Design a presentation structurally evolved with a content and organizing points.



COB. 5: To describe academic credentials exhibited by a coherent manner.

COB 6: To grow up the confidence of learners to make them fitful for the questions they encountered.

**Course Outcomes:**

At the end of the Course, Student will be able to:

CO.1. Recognize the way how body language functions in communicative and non- communicative domains. (BT-2 – Understand)

CO 2. Make use of effective delivery strategies to select compile and synthesize information for an oral presentations. (BT – 5 (Evaluation)

CO. 3.Demonstrate in Mock Interviews, Mock Discussion and Public Speaking. (BT 3 (Application)

CO.4. Identify communicative competency to respond to others in different situations. (BT.1 Remember)

CO. 5. Develop the writing skills to meet the organizational objectives (BT.6 – Create)

CO. 6. Asses the potentialities of learners to meet with future endeavors. (BT. 5 – Evaluate)

**PRACTICE 1:**

BODY LANGUAGE

**PRACTICE 2:**

DEBATING

**PRACTICE 3:**

GROUP DISCUSSION

**PRACTICE 4:**

PRESENTATION SKILLS

**PRACTICE 5:**

RESUME / CV WRITING

**PRACTICE 6:**

INTERVEIW SKILLS

**Prescribed Text Books:** **Interact** English Lab Manual for Undergraduate Students by Orient Black Swan Pvt. Ltd. Publishers

**Reference Books:**

1. Strengthen your Communication Skills by Dr.M.Hari Prasad, Dr.Salivendra J.Raju and Dr.G.Suvarna Lakshmi, Maruthi Publications.
2. English for Professionals by Prof Eliah, B.S Publications, Hyderabad.
3. A practical Course in effective English speaking skills, PHI
4. Spring Board to Success, Orient Black Swan
5. Cornerstone, developing soft skills, Pearson Education.