

# MANAGEMENT & ENTREPRENEURSHIP

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## UNIT 1

**Introduction to Management:** Definition of Management, Its nature and purpose, Contributions of F.W. Taylor and Henry Fayol to management theory, Functions of managers. Planning: Types of plans, Steps in planning, the planning process, Management By Objectives (MBO).

**Organizing:** The nature and purpose of organizing, Formal and informal organization.

Organization levels and Span of management, Principle of span of management, the structure and process of organizing.

## UNIT 2

**Staffing:** Situational factors affecting staffing. Leading: Human factors in managing, definition of leadership, Ingredients of leadership.

**Controlling:** Basic control process, Critical control points and standards, Control as a feedback system, Feed forward control, Requirements for effective controls.

## UNIT 3

**Introduction to Entrepreneurship:** The Foundations of Entrepreneurship: What is an Entrepreneurship? The benefits of Entrepreneurship, The potential drawbacks of Entrepreneurship; Inside the Entrepreneurial Mind.

**From Ideas to Reality:** Creativity, Innovation and Entrepreneurship, Creative Thinking, Barriers to Creativity.

## UNIT 4

**The Entrepreneurial Journey:** Crafting a Business Plan: The benefits of creating a business plan, the elements of a business plan; Forms of Business Ownership and Buying an Existing Business: Sole proprietorships and partnership.

## UNIT 5

**Launching the Business:** Franchising and the Entrepreneur: Types of Franchising, The benefits of buying a Franchise; E-Commerce and the Entrepreneur: Factors to consider before launching into E-commerce, Ten Myths of E-Commerce.

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# INTRO TO DEEP LEARNING

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## UNIT 1

**Introduction to Deep Learning:** Brief history of DL, working of weights and bias, working of single neuron, Working of a layer, layer implementation with numpy, Dense layer.

**Activation Functions:** Uses of activation function, Sigmoid, ReLu activation, Softmax Activation functions.

## UNIT 2

**Loss Function:** Categorical cross entropy loss, Binary Cross-Entropy loss and Accuracy calculation.

**Backpropagation and other Differentiation Algorithms, optimizers:** Stochastic Gradient Descent (SGD), Learning Rate and LR decay, SGD with momentum, AdaGrad, RMSProp, Adam.

## UNIT 3

**Convolutional Networks:** The Convolution Operation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features- LeNet, AlexNet.

## UNIT 4

**Principal Recurrent and Recursive Neural Networks:** Unfolding Computational Graphs, Recurrent Neural Network, Bidirectional RNNs, Deep Recurrent Networks, Recursive Neural Networks, The Long Short- Term Memory and Other Gated RNNs.

## UNIT 5

**Grouping Transformers and Vision transformers:** Self Attention and Multi-Head attention mechanism, positional encoding, residual connection, Encoder and Decoder.

**Applications:** applications of only Encoder, Decoder and Encoder-Decoder type models.

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# PRINCIPLE OF CRYPTOGRAPHY

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## UNIT 1

**Introduction:** Security Goals, Cryptographic Attacks, Services and Mechanism, Techniques. Symmetric ciphers, Introduction, Substitution Ciphers, Transposition Ciphers,

**Mathematics of Cryptography:** Integer Arithmetic, Modular Arithmetic, Matrices. Linear Congruence.

## UNIT 2

**Traditional Symmetric-Key Ciphers:** Block Ciphers and Data Encryption Standard (DES): Introduction, DES Structure, DES Analysis, Security of DES.

**Advanced Encryption Standard:** Introduction, Transformations, Key Expansion, The AES Ciphers. Examples, Analysis of AES. Block Ciphers and Operation

## UNIT 3

**Decipherment using Modern Symmetric-Key Ciphers:** Use of Modern Block Ciphers, Use of Stream Ciphers, Other Issues.

**Asymmetric Key Cryptography:** Introduction, RSA Cryptosystem. Rabin Cryptosystem, Elgamal Cryptosystem.

## UNIT 4

**Message authentication:** Authentication Requirements, Authentication Functions, Message Authentication Codes. Digital signatures: Digital Signatures, Digital Signature Algorithm.

**Key management and distribution:** Distribution of public keys, X.509 certificates. Kerberos

## UNIT 5

**System security:** Intruders: Intruders, Intrusion detection. Malicious Software: Types of Malicious Software, Viruses.

**Firewalls:** The need for Firewalls, Firewall Characteristics. Types of Firewalls.

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# CLOUD COMPUTING

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## UNIT 1

**Introduction:** Network centric computing and network centric content, Peer-to-peer systems, Cloud Computing, Cloud Computing delivery models & Services, Ethical issues, Cloud vulnerabilities, Challenges. Cloud Infrastructure: Amazon, Google, Azure & online services, open-source private clouds. Storage diversity and vendor lock-in, intercloud, Energy use & ecological impact of data centres, service level and compliance level agreement, Responsibility sharing, user experience, Software licensing.

## UNIT 2

**Cloud Computing:** Applications & Paradigms, Challenges, existing and new application opportunities, Architectural styles of cloud applications, Workflows: Coordination of multiple activities, Coordination based on a state machine model – the ZooKeeper, The MapReduce programming model,

**A case study:** the GrepTheWeb application, Clouds for science and engineering, High performance computing on a cloud, cloud computing for biological research, social computing, digital content, and cloud computing.

## UNIT 3

**Cloud Resource Virtualization:** Virtualization, Layering and virtualization, Virtual machine monitors, Virtual machines, Performance and security isolation, Full virtualization and paravirtualization, Hardware support for virtualization,

**Case study:** Xen -a VMM based on paravirtualization, Optimization of network virtualization in Xen 2.0, vBlades -paravirtualization targeting a x86-64 Itanium processor, A performance comparison of virtual machines, The darker side of virtualization, Software fault isolation.

## UNIT 4

**Cloud Resource Management and Scheduling:** Policies and mechanisms for resource management, Applications of control theory to task scheduling on a cloud, Stability of a two-level resource allocation architecture, Feedback control based on dynamic thresholds, Coordination of specialized autonomic performance managers, A utility-based model for cloud-based web services, Resource bundling, combinatorial auctions for cloud resources, Scheduling algorithms for 61 computing clouds, fair queuing, Start time fair queuing, Cloud scheduling.

## UNIT 5

**Storage systems:** Storage models, file systems, databases, DFS, General parallel File system, GFS, Apache Hadoop, Locks & Chubby, TPS & NOSQL databases, Bigdata, Mega store.

**Cloud security:** Risks, Security, privacy and privacy impacts assessments, Trust, VM Security, Security of virtualization, Security risks in shared images.

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