YEARS	COURSE	SUBJECTS	TOPICS	DURATION
1st Year	AI & ML	Introduction to AI and ML	What is AI and ML, Applications and use cases across industries, The data science workflow	50 Hours
		Python Basics	Introduction to Python and installation, Jupyter Notebook, Variables, List/Set/Dictionary/Tuple, Data types, Operators, User input, If/else/elif, Loops (for/while), Loop control (break/continue/pass), Functions, OOP	
		Introduction to ML	What is Machine Learning, Types (Supervised/Unsupervised), Applications and examples	
		Data Preprocessing	Data collection/cleaning, Feature engineering, Data visualization (Matplotlib/Seaborn), Handling missing data/outliers, Libraries (Pandas/NumPy/Scikit-learn)	
		Supervised Learning	Introduction, Linear regression, Decision Tree, Logistic regression, Random Forest, Support Vector Machines, Model evaluation (MSE/MAE/accuracy/precision/recall/F1score)	
2nd Year	AI & ML	Unsupervised Learning	Introduction, K-means clustering, Hierarchical clustering, Principal Component Analysis (PCA)	60 Hours
		Model Selection & Validation	Cross-validation, Overfitting/underfitting, Hyperparameter tuning, Model selection/comparison	
		Natural Language Processing	What is NLP, Text preprocessing, Word embeddings/Vectorization, Sentiment Analysis, Language models (BERT/GPT), Libraries (NLTK/SpaCy/Hugging Face)	
		Deep Learning	Feedforward neural networks, Backpropagation, Activation functions (ReLU/sigmoid/tanh), Neural networks/Deep learning intro, CNNs (image recognition), RNNs (sequence data), GANs, TensorFlow/PyTorch, LLMs (LangChain)	
		Final Project	ML or Deep Learning Project – guided project work with report and presentation	

	Cyber Security	Cyber Security Fundamentals	Introduction to Cyber Security – Roles and Responsibilities – CIA Triad – Cyber Threat Categories – Types of Hackers – Cyber Kill Chain	
		Networking & Infrastructure	Fundamentals of Networking – OSI and TCP/IP Model – NAT & PAT – Network Devices – Virtualization – Protocols (TCP/UDP)	
		Linux Essentials	Linux Fundamentals – Basic Commands – User Management – Permissions – Process Handling	
		Offensive Security	Footprinting – Scanning with Nmap – OSINT – Metasploit – Brute Force – Enumeration – Exploitation – Privilege Escalation	
3rd Year	**Cyber Security**	Web Application Security	OWASP Top 10 – BurpSuite – HTTP Requests and Responses	**50 Hours**
		Cloud Computing Fundamentals	Overview, Benefits – Service Models: IaaS, PaaS, SaaS – Deployment Models: Public, Private, Hybrid – Major Platforms: AWS, Azure, GCP – Cloud-Native App	
		Cloud Infrastructure and Networking	Virtualization – VMs – VPC, Subnetting – Load Balancing – Hybrid Networking – Network Security – Linux Networking	
		Cloud Storage and Databases	Object, Block, File Storage – Data Management – Cloud DBs: RDS, SQL – CAP Theorem – Replication, Sharding	
		Cloud Computer Services	Environment Setup – OWASP Mobile Top 10 – Static Analysis – Tools and Configuration	

Note ::: Lab facilities needed.

YEARS	SUBJECTS (Modules)	TOPICS	DURATION
Year 1	Cloud Computing Fundamentals	- Overview of Cloud Computing: Benefits, scalability, elasticity, cost-efficiency - Cloud Service Models: IaaS, PaaS, SaaS - Cloud Deployment Models: Public, Private, Hybrid - Major Cloud Platforms: AWS, Azure, GCP, Oracle Cloud - Cloud-Native Applications: Microservices, containerization, serverless	Included in 70 hours
Year 1	Cloud Infrastructure and Networking	- Virtualization and Hypervisor Technologies - Managing VMs in the Cloud - Networking Concepts: VPC, Subnetting, Routing, Security Groups - Load Balancing and Auto-scaling - Hybrid Cloud Networking: AWS Direct Connect, Azure ExpressRoute - Network Security: Firewalls, VPNs, IDS/IPS - Linux Networking in Cloud: Bridges, Bonding, VLANs	Included in 70 hours
Year 1	Cloud Storage and Databases	- Cloud Storage Options: Object, Block, File Storage - Managing Data: AWS S3, Azure Blob, GCP Storage - Cloud Databases: RDS, Azure SQL, Cloud SQL - Data Consistency Models: CAP Theorem, Eventual Consistency - Database Replication and Sharding	Included in 70 hours

Year 1	Cloud Compute Services	- Compute Services: AWS EC2, Azure VMs, GCP Compute Engine - Serverless Computing: AWS Lambda, Azure Functions, GCP Cloud Functions - Building Serverless Applications - Containerization and Orchestration: Docker, Kubernetes - Advanced Containerization: Docker, Kubernetes in cloud - Serverless Design Patterns	Included in 70 hours
	Total for Year 1		**70 hours**
Year 2	Cloud Security	- Identity and Access Management (IAM) - Securing Data in Transit and at Rest - Compliance and Governance: GDPR, HIPAA - Cloud Security Posture Management (CSPM) - Zero Trust Security Model - Advanced Threat Detection: AWS GuardDuty, Azure Sentinel - Advanced Linux Security: SELinux, AppArmor	Included in 70 hours
Year 2	Cloud Monitoring and DevOps	- Cloud Infrastructure Monitoring: AWS CloudWatch, Azure Monitor - Logging and Troubleshooting - DevOps in the Cloud: Automation, CI/CD, IaC - Cloud-Native Observability: Prometheus, Grafana - Cloud Automation: Terraform, Ansible - CI/CD Pipelines: Jenkins, integrating security	Included in 70 hours

Year 2	Cloud Automation and IaC	- Introduction to IaC: Terraform, CloudFormation, ARM - Terraform for Multi-cloud - Automating Cloud Infrastructure: Ansible - Serverless Infrastructure: AWS SAM, Serverless Framework - Cloud Cost Optimization	Included in 70 hours
Year 2	Linux in Cloud Environments	- RHCE for Cloud Infrastructure - Linux System Optimization: Performance tuning - Cloud-Based Automation: Ansible, Puppet - Linux Networking in Cloud: Advanced techniques - Cloud-Based Linux Security: Hardening, firewalls - Managing Cloud Instances with RHCE Skills	Included in 70 hours
Year 2	Cloud Certifications and Practical Applications	- AWS, Azure, GCP Certification Paths - RHCE and Cloud Integration - Certification Labs - Case Studies: Hybrid cloud, cloud-native apps - Real-world Applications: Secure, compliant cloud for regulated industries	Included in 70 hours
	Total for Year 2		**70 hours**