



YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
(An Autonomous Institution affiliated to R T M Nagpur University Nagpur)
Accredited by NAAC (1st Cycle) with 'A' Grade (Score 3.25 on 4 Point Scale)

Wanadongri, Hingna Road, Nagpur-441110

Department of Information Technology
(Minor in CC&BDA)



**B.E. Minor in Cloud Computing &
Big Data Analytics**
SoE & Syllabus 2021-22



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Department of Information Technology

SoE and Syllabus

B.E. Minor in Cloud Computing & Big Data Analytics

SoE No.
MIN-101

B.E. Minor in Cloud Computing & Big Data Analytics Information Brochure of Minor Program

1. Title of Program: **Minor in Cloud Computing & Big Data Analytics**
2. Type of Program : Minor
3. Department offering the program: Information Technology
4. Industry / Association / Collaboration: Industry
5. Department/s eligible to opt for the program: EE, ET, ME,EL,CV



The students from **CV, EL, EE, ETC, ME** are eligible to opt for this program.
Department of Computer Technology and Department of Information Technology students are not permitted to opt for the program.

6. General information about courses in program: (250 words)

The next wave of computing is in the Cloud! Increasingly businesses want to get out of the complexity of managing data centers and instead focus on their core competencies. This means that more and more businesses will adopt cloud computing as a means to handle their IT requirements which gives them the freedom from day-to-day management of IT infrastructure.

Cloud Computing is one of the fastest growing paradigms in the IT industry today. Most of the IT Industry are using resources from Cloud like Amazon Cloud, Google Cloud, Microsoft Cloud etc.

This B.E. Minor program with the specialization in Cloud Computing and Big Data Analytics will help students understand Cloud Computing and Big Data Analytics technologies. Cloud Computing is very much a work in progress at this time and so while the course comprehensively covers the basic technologies involved, the history of the cloud and its roots in Service Oriented Architecture and Utility Computing, it has ample scope to take in the fast changing models that are thrown out by cloud computing. Students of this program will also

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benefit from the several practical credits that provide hands-on capabilities on the various aspects of cloud.

7. Advance knowledge or research orientation of Program: (100 words) (for Honor)

The scope of cloud computing is very bright. According to a report, the cloud computing market in India is at \$2 billion and is expected to grow with an annual growth rate of 30%. By 2020, the cloud computing market in India is supposed to reach \$4 billion and create more than a million jobs in this country.

Roles specific to this domain, such as Cloud Infrastructure Engineer, Cloud Architect, Cloud Enterprise Architect, and Cloud Software Engineer, are in massive demand according to a report.

With such expected growth, you can understand how fantastic the career prospects are for professionals in cloud computing.

Cloud computing jobs are on the rise. According to a recent analysis, the international cloud computing market is expected to rise to \$72 billion by 2015, and around 3 lakh job opportunities in India are expected in the same period. The roles in Cloud Computing might range from cloud developers to operators. Every role comprises of the knowledge of the cloud computing basics and certain domain specific skills.

8. Employability potential of program: (100 words)



(for both Honor /Minor)

Here are some of the popular Cloud related job profiles:

- Cloud Software Engineer
- Cloud Project Manager
- Cloud Business Analyst
- Cloud Network Architect/Planner
- Cloud Product Manager
- Cloud Sales Executive
- Cloud_Developer/Programmer
- Cloud Consultant
- Cloud Systems Engineer
- Cloud Systems Administrator
- Cloud Network Engineer

List of Best Cloud Computing Companies

Amazon Web Services

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Kamatera Cloud
Serverspace
Linode
ScienceSoft
ScalaHosting
Cloudways
OVHcloud
LiquidWeb

9. Departmental Steering committee: For proper publicity / conduct of program

SN	Name of the Faculty Member	Post	Designation	e-mail ID	Contact Number
1.	Dr. R. C. Dharmik	HOD, IT & Chairman	Asstt. Prof.	raj_dharmik@yahoo.com	9158003335
2.	Prof. S.S.Chavhan	Member	Asst.prof	sschavhan@ycce.edu	8888832405
3.	Prof. S.W. Shende	Member	Asso. Prof.	shailendra.shende@gmail.com	9766698600
4.	Prof. A.D. Gaikwad	Member	Asst.prof	amolgaikwad.ag@gmail.com	9970743434

10. Program Coordinator:

SN	Name of the Faculty Member	Post	Designation	e-mail ID	Contact Number
1	Prof. A.D. Gaikwad	Member	Asst.prof	amolgaikwad.ag@gmail.com	9970743434

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Scheme of Examinations Minor in Cloud Computing and Big Data Analytics

SN	Sem	Sub. Code	Course Name	T/P	L	P	Hrs	Credits	MSEs	TA	ESE	ESE-Hr
1	V	ITM101	Introduction to Cloud Computing	T	3	0	3	3	30	30	40	3
2	V	ITM102	Cloud Architecture & Computing	T	3	0	3	3	30	30	40	3
3	VI	ITM111	Big Data Analytics	T	3	0	3	3	30	30	40	3
4	VI	ITM112	Lab. : Big Data Analytics	P	0	2	2	1		60	40	
5	VI	ITM113	Cloud Security	T	3	0	3	3	30	30	40	3
6	VI	ITM114	Lab : Cloud Security	P	0	2	2	1		60	40	
7	VII	ITM121	Cloud Application Development using Salesforce	T	3	0	3	3	30	30	40	3
8	VII	ITM122	Lab.: Cloud Application Development using Salesforce	P	0	2	2	1		60	40	
Total					15	6	21	18				

MSEs* = Three MSEs of 15 Marks each will conducted and marks of better 2 of these 3 MSEs will be considered for Continuous Assessment

TA ** = for Theory : 20 marks on lecture quizzes, 8 marks on assignments, 2 marks on class performance

TA = for Practical : MSPA will be 15 marks each**

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V Semester

ITM101	Introduction to Cloud Computing			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	15	15	15	30	40	100	3 Hrs

Prerequisites

Course Objective

Students should be able to

1. To provide students with the fundamentals and essentials of Cloud Computing.
2. To provide students a sound foundation of the Cloud Computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.
3. To enable students exploring some important cloud computing driven commercial systems and applications.
4. To expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research.

Course Outcome

Students will be able to

1. To understand the necessary theoretical background for computing and storage clouds environments.
2. To know the methodologies and technologies for the development of applications that will be deployed and offered through cloud computing environments.
3. To be able to realize cloud infrastructures by using IaaS software, while also developing cloud applications by utilizing PaaS software.

UNIT I :

Introduction to Cloud Computing, definition and characteristics of cloud computing, Different Computing Paradigms: Client-Server Computing, Cluster computing, Grid Computing, Distributed Computing, Utility Computing, Fog and Sky Computing, Cloud computing Service Models and deployment models. Advantages and disadvantages of cloud Computing.

UNIT II :

Functioning of Cloud Computing, Cloud Architecture, Cloud Storage, Cloud Computing Concepts: Virtualization, Types of Virtualization, Creation of Virtual Machines, Hypervisors, Types of hypervisor, Load Balancing, Deployment, scalability and Elasticity, Replication, types of replication, cloud Monitoring, Identity and Access Management, Service Level Agreement and Billing System.

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UNIT III :

Cloud computing architecture, cloud computing stack, comparison with traditional computing architecture (client-server), cloud storage, server storage, storage as a service, data storage in cloud computing, resource virtualization, Cloud Computing Technology, Introduction, Network- Basic Public Internet, The Accelerated Internet- Optimized Internet Overlay- Site-to-Site VPN, Software defined Network, Network function virtualization.

UNIT IV :

Introduction to cloud application design, cloud design consideration for cloud applications, Design considerations: Scalability, Reliability, Availability, security, maintenance, up gradation and performance, Reference architecture for cloud application, cloud application design methodology, Service Oriented Architecture (SOA), Cloud Component Model (CCM), Data Storage approaches: Relational and Non-relational approaches, example.

UNIT V:

Service Management in Cloud Computing, Service Level Agreements(SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling: Benefitting enormously, Managing Data: Looking at Data, Scalability & Cloud Services, Database & Data Stores in Cloud, Large Scale Data Processing.

UNIT VI:

Introduction to Amazon Web Services (AWS), Amazon Elastic Compute Cloud (EC2), Amazon Simple Storage Service (S3), Google Compute Engine, Google app engine, Salesforce, Accessing the Cloud, Web Application Framework- Web Hosting Services- Proprietary Methods, Web Applications- API's in Cloud Computing, Browsers for Cloud Computing- Internet Explorer- Mozilla Firefox- Safari- Chrome.

Text Books:

	Title	Edition	Author	Publisher
1	Enterprise Cloud Computing		Gautam Shroff	Cambridge Press
2	Cloud Computing- A Hands On Approach		Arshdeep Bahga, Vijay Madiseti	University Press(INDIA) Private Ltd.

Reference Book:

	Title	Edition	Author	Publisher
1	Google Apps		University Press(INDIA) Private Ltd.	Pearson Publication
2	Cloud Computing for Dummies		Judith Hurwitz, R. Bloor, M. Kanfman, F. Haper	Wiley India Edition

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V Semester

ITM102	Cloud Architecture & Computing			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	15	15	15	30	40	100	3 Hrs

Prerequisites

Course Objective

Students should be able to

1. Learn and understand the different computing paradigms and its architecture
2. Learn and understand the different deployment and Service model of cloud Computing
3. Learn and understand the architecture of cloud that used for design any type of cloud

Course Outcome

Students will be able to

1. Articulate the differences between deployment models and service models of cloud computing.
2. Apply different deployment and Service models for building any type of cloud
3. Identify the cloud architecture for designing any cloud
4. Apply service Management in cloud computing

UNIT I : Introduction to Cloud Computing :

Cloud Computing (NIST Model), Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Properties, Characteristics & Disadvantages, Pros and Cons of Cloud Computing, Benefits of Cloud Computing, Cloud computing vs. Cluster computing vs. Grid computing, Role of Open Standards.

UNIT II : Cloud computing stack :

Comparison with traditional computing architecture (client/server), Services provided at various levels, How Cloud Computing Works, Role of Networks in Cloud computing, protocols used, Role of Web services, Service Models (XaaS): Infrastructure as a Service(IaaS), Platform as a Service(PaaS), Software as a Service(SaaS) Deployment Models: Public cloud, Private cloud, Hybrid cloud, Community cloud

UNIT III : Infrastructure as a Service(IaaS):

Introduction to IaaS, IaaS definition, Introduction to virtualization, Different approaches to virtualization, Hypervisors, Machine Image, Virtual Machine(VM), Resource Virtualization, Server Storage, Network, Virtual Machine(resource) provisioning and manageability, storage as a service, Data storage in cloud computing(storage as a service), Examples, Amazon EC2, Renting, EC2 Compute Unit, Platform and Storage, pricing, customers, Eucalyptus.

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UNIT IV :

Platform as a Service(PaaS): Introduction to PaaS,What is PaaS, Service Oriented Architecture (SOA),Cloud Platform and Management, Computation Storage Examples Google App Engine Microsoft Azure, Salesforce.com's Force.com platform.

UNIT V: Software as a Service(SaaS):

Introduction to SaaS, Web services, Web 2.0,Web OS, Case Study on SaaS

UNIT VI: Service Management in Cloud Computing: Service Level Agreements(SLAs),Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling: Benefitting enormously, Managing Data, Looking at Data, Scalability & Cloud Services, Database & Data Stores in Cloud, Large Scale Data Processing

Text Books:

	Title	Edition	Author	Publisher
1	Cloud Computing Bible,		Barrie Sosinsky,	Wiley-India, 2010
2	Cloud Computing: Principles and Paradigms,		Rajkumar Buyya, James Broberg, Andrzej M. Goscinski,	Wile, 2011

Reference Book:

	Title	Edition	Author	Publisher
1	Cloud Computing: Principles, Systems and Applications		Nikos Antonopoulos, Lee Gillam,	Springer, 2012
2	Cloud Security: A Comprehensive Guide to Secure Cloud Computing,		Ronald L. Krutz, Russell Dean Vines,	Wiley-India, 2010

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VI Semester

ITM111	Big Data Analytics			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	15	15	15	30	40	100	3 Hrs

Prerequisites

Course Objective

Students should be able to

1. Understand the need of Big Data, challenges and different analytical architectures
2. Learn Installation and understanding of Hadoop Architecture and its ecosystems

Course Outcome

Students will be able to

1. Discuss the challenges and their solutions in Big Data
2. Understand and work on Hadoop Framework and eco systems.
3. Explain and Analyze the Big Data using Map-reduce programming in Hadoop framework.
4. Learn to build and maintain reliable, scalable, distributed systems with Apache Hadoop

UNIT I : Introduction To Big Data

Data Storage and Analysis - Characteristics of Big Data – Big Data Analytics - Typical Analytical Architecture – Requirement for new analytical architecture – Challenges in Big Data Analytics – Need of big data frameworks.

UNIT II : Introduction Hadoop

Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization

UNIT III : Hadoop Architecture

Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering –Monitoring & Maintenance.

UNIT IV : Hadoop Ecosystem And YARN

Hadoop ecosystem components - Schedulers - Fair and Capacity, Hadoop 2.0 New Features- NameNode High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in YARN.

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UNIT V: HIVE AND HIVEQL, HBASE :

Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase concepts- Advanced Usage, Schema Design, Advance Indexing - PIG, Zookeeper - how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

UNIT VI: Data Analytics with R, Machine Learning: Introduction, Supervised Learning, Unsupervised Learning, Collaborative Filtering. Big Data Analytics with BigR.

Text Books:

	Title	Edition	Author	Publisher
1	Understanding Big data		Chris Eaton, Dirk deeroos et al.	McGraw Hill, 2012.
2	HADOOP: The definitive Guide		Tom White	O Reilly 2012.

Reference Book:

	Title	Edition	Author	Publisher
1	Big Data Analytics with R and Haoop		Vignesh Prajapati	Packet Publishing 2013.
2	Big Data Analytics		Seema Acharya, Subhasini Chellappan	Wiley 2015

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VI Semester

ITM112	Lab : Big Data Analytics			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	15	15	15	60	40	100	3 Hrs

Prerequisites

Course Objective

Students should be able to

Analyse and implement different frame work tools by taking sample data sets

Course Outcome

Students will be able to

Illustrate and implement the concepts by taking an application problem.

Sr. Practical Title

- 1 To understand the overall programming architecture using Map Reduce API
 - (i) Perform setting up and Installing Hadoop in its two operating modes:
 - 2 • Pseudo distributed,
 - Fully distributed.
 - (ii) Use web based tools to monitor your Hadoop setup
- 3 Store the basic information about students such as roll no, name, date of birth , and address of student using various collection types such as List, Set and Map
 - (i) Implement the following file management tasks in Hadoop:
 - Adding files and directories
 - Retrieving files
 - Deleting files
 - ii) Benchmark and stress test an Apache Hadoop cluster
- 5 Basic CRUD operations in MongoDB
- 6 Retrieve various types of documents from students collection
- 7 To find documents from Students collection
- 8 Develop Map Reduce Work Application
- 9 Creating the HDFS tables and loading them in Hive and learn joining of tables in Hive

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Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented. Data available at: <https://github.com/tomwhite/hadoopbook/tree/master/input/ncdc/all>.

- Find average, max and min temperature for each year in NCDC data set?
- Filter the readings of a set based on value of the measurement, Output the line of input files associated with a temperature value greater than 30.0 and store it in a separate file.

Text Books:

	Title	Edition	Author	Publisher
1	Understanding Big data		Chris Eaton, Dirk deroos et al.	McGraw Hill, 2012.
2	HADOOP: The definitive Guide		Tom White	O Reilly 2012.

Reference Book:

	Title	Edition	Author	Publisher
1	Big Data Analytics with R and Haoop		Vignesh Prajapati	Packet Publishing 2013.
2	Big Data Analytics		Seema Acharya, Subhasini Chellappan	Wiley 2015

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VI Semester

ITM113	Cloud Security			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	15	15	15	30	40	100	3 Hrs

Prerequisites

Course Objective

Students should be able to

1. Understand current security standards, protocols, and best practices intended for delivering Cloud based enterprise IT services
2. Learn Architectural and design approaches to designing secure cloud services
3. Applying industry security standards, regulatory mandates, audit policies and compliance requirements
4. Survey on Cloud vendor security implementations and compliance

Course Outcome

Students will be able to

1. Describe cloud security architectures from the perspectives of: providers, brokers, carriers, and auditors.
2. Describe a methodology for orchestrating a cloud ecosystem.
3. Understand how cloud computing changes the traditional enterprise security considerations compared to on-premise.
4. How shared security responsibilities change in each service model.

UNIT I :

Introduction: Cloud Computing Defined ,The SPI Framework for Cloud Computing ,The Traditional Software Model ,The Cloud Services Delivery Model ,Cloud Deployment Models, Key Drivers to Adopting the Cloud ,The Impact Of Cloud Computing on users, Governance in the Cloud, Barriers to Cloud Computing Adoption in the Enterprise.

UNIT II :

Infrastructure Security: Infrastructure Security: the Network Level, Infrastructure Security: The Host Level, Infrastructure Security: The Application Level
SECURITY AND STORAGE : Aspects Of Data Security, Data Security Mitigation, Provider Data and Its Security.

UNIT III :

Identity And Access Management: Trust Boundaries and IAM ,why IAM? ,IAM Challenges, IAM Definitions IAM Architecture and Practice ,Getting Ready for the Cloud ,Relevant IAM Standards and protocols for Cloud Services, IAM practices in the Cloud ,Cloud Authorization Management, Cloud Service provider IAM practice ,Guidance

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UNIT IV :

Security Management In The Cloud: Security Management Standards ,Security Management in the Cloud ,Availability Management ,SaaS Availability Management, PaaS Availability Management, IaaS Availability Management ,Access Control ,Security Vulnerability, patch, and Configuration Management , Cloud Service provider IAM practice

UNIT V:

Privacy : What Is Privacy?, What Is the Data Life Cycle?, What Are the Key Privacy Concerns in the Cloud? ,Who is Responsible for protecting Privacy? ,Changes to Privacy Risk Management and Compliance in Relation to Cloud Computing and Regulatory Implications, U.S. Laws and Regulations , International Laws and Regulations

UNIT VI:



Audit And Compliance : Internal Policy Compliance Governance, Risk, and Compliance (GRO Illustrative Control Objectives for Cloud Computing CSP-Specific Objectives Additional Key Management Control Objectives Control Considerations for CSP users Regulatory/External Compliance Other Requirements Cloud Security Alliance Auditing the Cloud for Compliance Summary EXAMPLES OF CLOUD SERVICE PROVIDERS Amazon Web Services (IaaS) Google (SaaS, PaaS) Microsoft Azure Services Platform (PaaS) proofpoint (SaaS, IaaS) RightScale (IaaS) Salesforce.com (SaaS, PaaS) Sun Open Cloud Platform Workday

Text Books:

	Title	Edition	Author	Publisher
1	Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance	1 st Edition	Tim Mather, SubraKumaraswamy, ShahedLatif	O'Reilly Media
2	Cloud Security	1 st Edition	Ronald L. Krutz, Russell Dean Vines	O'Reilly Media

Reference Book:

	Title	Edition	Author	Publisher
1	Securing the Cloud	1 st Edition	R. Winkler	IT resolution Press
2	The NIST Definition of Cloud Computing	1 st Edition	Peter Mell, Timothy Grance	IT resolution Press

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VI Semester

ITM114	Lab. : Cloud Security			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
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2. Describe a methodology for orchestrating a cloud ecosystem.
3. Understand how cloud computing changes the traditional enterprise security considerations compared to on-premise.
4. How shared security responsibilities change in each service model.

Exp. Name of Experiment
No

- 1 Working and Implementation of Infrastructure as a service
- 2 Working and Implementation of Software as a service
- 3 Working and Implementation of Platform as a services
- 4 Practical Implementation of Storage as a Service
- 5 Working of Google drive to make spreadsheet and notes
- 6 Working and Implementation of identity management
- 7 Write a program for web feed
- 8 Execute the step to Demonstrate and implementation of cloud on single sign on
- 9 Practical Implementation of cloud security.10.Installing and Developing Application Using Google App Engine

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10 Implementation of Cloud Failure Cluster

Text Books:

	Title	Edition	Author	Publisher
1	Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance	1 st Edition	Tim Mather, SubraKumaraswamy, ShahedLatif	O'Reilly Media
2	Cloud Security	1 st Edition	Ronald L. Krutz, Russell Dean Vines	O'Reilly Media

Reference Book:

	Title	Edition	Author	Publisher
1	Securing the Cloud	1 st Edition	.R. ("Vic") Winkler	IT resolution Press
2	The NIST Definition of Cloud Computing	1 st Edition	Peter Mell, Timothy Grance	IT resolution Press

		May 2021	1.00	Applicable for AY2021-22 Onwards
Chairperson	Dean (Acad. Matters)	Date of Release	Version	



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

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Department of Information Technology

SoE and Syllabus

B.E. Minor in Cloud Computing & Big Data Analytics

SoE No.
MIN-101

VII Semester

ITM121	Cloud Application Development using Salesforce			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	15	15	15	30	40	100	3 Hrs

Prerequisites

Course Objective

Students should be able to

1. Study the Cloud Computing components
2. Cloud Computing fundamentals and Force.com platform
3. Storage management in cloud environment
4. Storage Solution in cloud architecture

Course Outcome

Students will be able to

1. Analyse the components of cloud computing
2. To Understand Cloud Computing Fundamental and Force.com platform
3. Evaluate information storage management design in a cloud environment and how it relates to the business objectives of an organization
4. Analyse the role technology plays in the design of a storage solution in a cloud architecture

UNIT I : CLOUD COMPUTING FUNDAMENTALS

Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. Application availability, performance, security and disaster recovery; next generation Cloud Applications

UNIT II : CLOUD APPLICATIONS

Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages

UNIT III : Introducing the Force.com Platform. - Introduction to the Force.com Platform. The Basics of an App's User Interface. The Benefits of a Force.com Data-Centric, Collaborative Apps, The Technologies Behind a Force.com Platform App, Multitenant Architecture, A Metadata-Driven

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Development Model, Apex . Custom User Interface Mobile, AppExchange.

UNIT IV : Objects and Tabs: Introduction to Objects , ,Introduction to Fields , Introduction to Picklists , Field Dependencies , Dependent Picklist ,Custom Formula Fields , Dynamic Default Values , Validation Rules, Page Layouts , Page Layout Editor Group Fields Edit Field Properties , Page Layouts , Compact Layouts.

UNIT V: Relationships: Introduction to Relationship Custom Fields, Page Layout Properties, Record Highlights, Introduction to Search Layouts, Introduction to Roll-Up Summary Fields, Many-to-Many Relationship.



UNIT VI: Securing and Sharing Data: Controlling Access to Data in App, Data Access Concepts. Co, Introduction to Profiles, ,Introduction to Field-Level Security , Introduction to Hierarchies , Introduction of Sharing Rules , Introduction to Manual Sharing , Manual Sharing Rule.

Text Books

Sr. No	Title	Authors	Publisher
1	Force.com Platform Fundamentals An Introduction to Custom Application Development in the Cloud	Phil Choi Chris McGuire Caroline Roth	salesforce.com
2	Salesforce Handbook Paperback	Wes Nolte , Jeff Douglas	Publisher: Lulu.com
3	REST in Practice	Jim Webber, Savas Parastatidis, Ian Robinson	O'Reilly Media; 1 edition, [ISBN: 978-0596805821] 2010.
4	Developing Applications for the Cloud on the Microsoft Windows Azure Platform	Eugenio Pace, Dominic Betts, Scott Densmore, Ryan Dunn, Masashi Narumoto, MatiasWoloski	Microsoft Press; 1 edition, [ISBN: 9780735656062] 2010

Reference Books

1	Salesforce CRM: The Definitive Admin Handbook Paperback	Paul Goodey,	2nd edition Publisher: Packt Publishing Limited;
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B.E. Minor in Cloud Computing & Big Data Analytics

SoE No.
MIN-101

VII Semester

ITM122	Lab : Cloud Application Development using Salesforce			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	15	15	15	60	40	100	3 Hrs

Prerequisites

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Students should be able to

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S.No

Title of Practical

1. Configure Hyper-V
 - Create and configure virtual machine settings.
 - Create and configure virtual machine storage.
 - Create and configure virtual networks.
2. Configure and Manage Virtual Machine High Availability
 - Configure failover clustering with Hyper-V.
 - Manage failover clustering roles.
 - Manage virtual machine movement.
3. Implement a Server Virtualization Infrastructure
 - Implement virtualization hosts.
 - Implement virtual machines.
 - Implement virtualization networking.
 - Implement virtualization storage.
 - Manage and maintain a server virtualization infrastructure.
4. Monitor and Maintain a Server Virtualization Infrastructure
 - Plan and implement a monitoring strategy.
 - Plan and implement a business continuity and disaster recovery solution.
 - Industry Leading VeeamOne & VeeamBackup Solution

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3	REST in Practice	Jim Webber, Savas Parastatidis, Ian Robinson	O'Reilly Media; 1 edition, [ISBN: 978-0596805821] 2010.
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