Dr. Vishwanath Karad
MIT WORLD PEACE UNIVERSITY | PUNE
TECHNOLOGY, RESEARCH, SOCIAL INNOVATION & PARTNERSHIPS

CET4034B: Cloud Infrastructure and Security

SCHOOL OF COMPUTER ENGINEERING AND TECHNOLOGY

T. Y. B. TECH. CSE(CYBERSECURITY AND FORENSICS)

MIT-WPU

Dr. Vishwanath Karad
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B. Tech. CSE (Cybersecurity and Forensics) (Third Year) (Batch 2021 – 2025)

Semester – VI

Sr. No.	Course Code	Name of Course	Type	Weekly Workload, Hrs.			Credits		Assessment Marks**			
				Theory	Tutorial	Lab	Th.	Lab	CCA*	LCA*	End Term Test	Total
1	CET4034B	Cloud Infrastructure and Security	PC	2	--	2	2	1	30	30	40	**100**
2	CET2008B	Theory of Computation	PC	3	--	--	3	--	60	--	40	**100**
3	CET4010B	Vulnerability Identification and Penetration Testing	PC	3	--	2	3	1	30	30	40	**100**
4		**Professional Elective -II*** A. Data Privacy (CET4006B) B. Data Science for Cybersecurity and Forensics (CET4036B) C. Cyber Physical Security (CET4037B) D. Security Platforms and Tools (CET4038B)	PE	3	--	2	3	1	30	30	40	**100**
5	CET2009B	Mini Project	PR	--	--	2	--	1	--	100	--	**100**
6	CET3008B	Seminar	PR	--	--	2	--	1	--	100	--	**100**
7	CIV1026B	Environmental Science	BS	1	--	--	1		100	--	--	**100**
8	FET2001B	Employment Skills Development - II	HSS	2	--	--	--	--	--	--	--	--
9	FET2005B	Finance and Costing	HSS	2	--	--	2	--	60	--	40	**100**
10	WPC2012B	Humanities - Ethical, Moral and Social Sciences	WP	2	--	--	2	--	60	--	40	**100**
		Total :		**18**	**--**	**10**	**16**	**5**	**370**	**290**	**240**	**900**

****Assessment Marks are valid only if Attendance criteria are met**

Weekly Teaching Hours: 28

Total Credits: Third Year B. Tech. Semester VI: 21

Total Third Year B. Tech. Credits: 20 + 21 = 41

* CCA : Class Continuous Assessment

* LCA : Laboratory Continuous Assessment

Approved by Academic Council
23 JUL 2022

Dr. Prasad Khandekar
Dean

CET4034B: Cloud Infrastructure and Security

Teaching Scheme
Theory: 2 Hrs. / Week

Credits: 02 + 01 = 03
Practical: 2 Hrs./Week

Course Objectives

1) Knowledge

i. To study basic cloud computing concepts and its operational environment.

2) Skills

i. To acquire skills of using various Virtualization Techniques and Platforms
ii. To understand challenges in cloud computing

3) Attitude

i. To select and use cloud computing platform

Course Outcomes

After completion of this course students will be able to

i. Setup a cloud environment
ii. Deploy web services efficiently on a cloud platform
iii. Manage cloud services efficiently and effectively
iv. Design, deploy and address the cloud security aspects

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Syllabus

Module 1: Introduction To cloud Computing [8]

- Introduction
- Roots of Cloud Computing: From mainframe to Cloud
- Benefits of Cloud Computing
- SOA
- Web services, Role of Networks in Cloud Computing: Cloud types and service models
- Primary Cloud Service models, Cloud Services brokerage, Primary cloud deployment models, cloud computing reference model, The greenfield and brownfield deployment options.

Module 2: Understanding Virtualization [7]

- Virtualization, Concept of Hypervisor
- Types of Hypervisor
- Taxonomy of Virtualization
- Virtualization and machine reference model
- Hardware virtualization techniques
- Pros and Cons of Virtualization, Live migration, Technology examples: Xen, KVM, VMware, Microsoft Hyper-V.

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Syllabus

Module 3: Amazon Web Service [8]

- Services offered by Amazon Hands-on Amazon
- EC2 - Configuring a server, Virtual Amazon Cloud
- AWS Storage and Content Delivery
- Identify key AWS storage options Describe Amazon EBS Creating an Elastic Block Store Volume.
- Create an Amazon S3 bucket and manage associated objects. AWS Load Balancing Service Introduction Elastic Load Balancer Creating and Verifying Elastic Load Balancer.

Module 4: Security in cloud computing [7]

- Introduction, Global Risk and Compliance aspects in cloud environments and key security terminologies
- Digital identity and access management, Content level security
- Future of Cloud computing: Docker, serverless lambda, MicroServices, Cloud Forensics

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Practical Assignments

Assignment No.	Assignment Title	Workload in Hrs.
		Lab.
1.	Install VM-Ware Workstation on a windows platform and deploying an Ubuntu server VM as per requirement.	04
2.	Write a web service using java or python. Deploy the service using PaaS tools such as cloud Cloud Foundry/ GoogleAppEngine/OpenShift.	04
3.	Create an account on AWS. Deploy a website for admission portal on the EC2 Service. Configure the Traffic rules of the Server for a specific need. Creation of Application Load Balancer	04
4.	Write a program to Manage and monitor S3 operations to a specific Account using BOTO3 or equivalent libraries.	04
5.	Install Docker on Windows/Ubuntu operating system	04
6.	Mini Project	10

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Assessment Scheme

Class Continuous Assessment (CCA) : 30 Marks

Mid Term Exam	Component 1 Active Learning	Component 2 Theory Assignment
15 Marks	10 Marks	05 Marks

Laboratory Continuous Assessment (LCA) : 30 Marks

Lab Assignment / Practical Performance	Mini Project/ Additional implementation/ On paper design	End term practical /oral examination
10 Marks	10 Marks	10 Marks

Term End Theory Examination: 40 Marks

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Learning Resources

Text books

1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, “Mastering Cloud Computing”, Tata McGraw Hill, ISBN-13: 978-1-25-02995-0
2. Tim Mather, Subra K, Shahid L, Cloud Security and Privacy, OReilly, ISBN-13 978-81-8404-815-5
3. Rajkumar Buyya, James Broberg, Andrzej Goscinski, “Cloud computing Principles and Paradigms”, Wiley Publication.
4. Barrie Sosinsky, “Cloud Computing", Wiley India, ISBN: 978-0-470-90356-8
5. Kailash Jayaswal, “Cloud computing", Black Book, Dreamtech Press
6. Thomas Erl, Zaigham Mahmood and Ricardo Puttini, “Cloud Computing: Concepts, Technology and Architecture”, Pearson, 1st Edition.

Reference Books

1. Introduction to the Theory of Computation, Michael Sipser.
2. Introduction to Languages and the Theory of Computation, John Martin.
3. Computers and Intractability: A Guide to the Theory of NP Completeness, M. R. Garey and D. S. Johnson

Supplementary Reading:

1. Dr. Kumar Saurabh, “Cloud Computing”, Wiley Publication

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Learning Resources

Web Resources:

i. https://www.ibm.com/cloud-computing/files/cloud-for-dummies.pdf

Web links

i. https://docs.aws.amazon.com/

ii. https://docs.microsoft.com/en-us/azure/

MOOCs:

i. https://www.coursera.org/learn/gcp-fundamentals
ii. https://nptel.ac.in/courses/106105167/

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THANK YOU FOR LISTENING ANY QUESTION?