

University of Computer Studies (Thaton)
2025-2026 Academic Year
Fifth Year (B.C.Sc.)
Lecture Plan

CS-5114 Strategies for Emerging Technology II

First Semester

Textbooks:

- [1] Virtualization for Dummies (3rd Hp Special Edition) By Bernard Golden
- [2] Blockchain for Beginners by Blockchain Council, 2020
- [3] Blockchain Basic by Daniel Drescher, 2017, The Apress Business Team, ISBN-13: 978-1-4842-2603-2.
- [4] The Internet of Things in the Cloud: A Middleware Perspective by Honbo Zhou, 2012
- [5] The Era of Internet of Things: Towards a Smart World by Khaled Salah Mohamed, Springer, 2020
- [6] The Cloud in IoT-enabled Spaces by Fadi Al-Turjman, CRC Press, 2022
- [7] Cloud Computing Concepts, Technology & Architecture by Thomas Erl, Zaigham Mahmood and Ricardo Puttini, Prentice-Hall, 2013

References:

- [1] Network Virtualization for Dummies (2nd VMware Special edition), by Jonathan Morin and Shinnie Shaw, ©2018 by John Wiley & Sons, Inc., ISBN 978-1-119-55049-5
- [2] Cloud Computing: Theory and Practice by Dan C. Marinescu
- [3] Handbook of Cloud Computing
 - Hands-on Lab (<https://awseducate.instructure.com>)
 - AWS Skill Builder (<https://skillbuilder.aws/>)
- [4] “Next-Gen Virtualization for Dummies” (VMware Special Edition), by Himanshu Singh, © 2019 by John Wiley & Sons, Inc., ISBN 978-1-119-61167-7
- [5] Corresponding Online Resources for Blockchain:
 - <https://www.coursera.org/specializations/blockchain>
 - <https://www.simplilearn.com/tutorials/blockchain-tutorial>
 - https://onlinecourses.nptel.ac.in/noc20_cs01/preview
 - <https://101blockchains.com/>

Prerequisite : CS-4216 Strategies for Emerging Technology I

Credit Unit : 3 ACUs

Periods : 64 periods for 16 weeks (4 periods * 16 weeks) (1 period -1 hr.)

| No. | Topics | Week | Remark |
|---|---|--------|---|
| Lecture Plan for Virtualization | | | |
| | Why You Need Virtualization | | Lecture + Assignment |
| 1. | Increases and Reduces IT QoS, HA and DR End-User Manageability and Security and Virtualization Is Green | Week 1 | Explain it in detail [Virtualization for Dummies] |
| | Understanding Virtualization Technologies | | Lecture + Assignment |
| 2. | Server Virtualization Storage Virtualization I/O Virtualization, Network Virtualization and Client Virtualization Application virtualization, Desktop virtualization and Desktop streaming | Week 2 | Explain it in detail [Virtualization for Dummies] Assignment I |
| 3. | Understanding Virtualization Use Cases | | Lecture + Assignment |
| | Studying Server Consolidation QoS and HA Clustering, Data mirroring and Data replication IT Operational Flexibility Helping with Disaster Recovery | Week 3 | Explain it in detail [Virtualization for Dummies] |
| 4. | Paper Review and Presentation | Week 4 | |
| Lecture Plan for Blockchain Technology | | | |
| | Blockchain Basics | | Lecture |
| 5. | <ul style="list-style-type: none"> ● Blockchain ● Database vs Blockchain Data Storage ● Features of Blockchain ● History and Origin of Blockchain ● Development of Blockchain technology (1.0-Bitcoin, 2.0-Smart Contract, 3.0- Decentralized apps, 4.0-Industry Usage | Week 5 | Explain it in detail. [Blockchain for Beginners by Blockchain Council] |
| | Fundamental Concepts of Blockchain Technology | | |

| No. | Topics | Week | Remark |
|--|--|-----------|--|
| 6. | <ul style="list-style-type: none"> • Different Types of Blockchain • Public Blockchain • Private Blockchain • Consortium Blockchain • Hybrid Blockchain • Blockchain Platforms • Bitcoin • Ethereum Hyperledger • Technical concepts of Blockchain • Distributed Ledger Technology • Cryptographic Elements in Blockchain • Consensus Methods • Smart Contract | Week 6 | <p>Explain it in detail [Blockchain for Beginners by Blockchain Council] [Blockchain Basic by Daniel Drescher] Tutorial I</p> |
| Blockchain Architecture and Use Cases | | | |
| 7. | <ul style="list-style-type: none"> • Blockchain Layers • Blockchain Use cases <ul style="list-style-type: none"> • Supply Chain Management • Digital Identity (E-ID) • Education • Voting • Healthcare • Real Estate | Week 7 | <p>Explain it in detail [Blockchain for Beginners by Blockchain Council] Quiz I</p> |
| 8. | <p>Term Paper (or) Lab Lab Truffle Framework & Ganache: Environment Setup for Truffle & Ganache, Truffle Project Creation, Truffle Compile, Migrate and Create Commands. Decentralized App (Dapp) Creation: Smart Contract Creation, Front-End Creation, Connecting Smart Contract with Front-End Application, Deploying Dapp, Validation, MetaMask wallet interacts with Dapp.</p> | Week 8 | Lab |
| Lecture Plan for Cloud Security | | | |
| | Fundamental Cloud Security | | Chapter 6 |
| 9. | <p>6.1 Basic Terms and Concepts 6.2 Threat Agents 6.3 Cloud Security Threats 6.4 Additional Considerations Summary of key points and presentation Hands-on Lab</p> | Week 9-10 | <p>Explain it in detail [Cloud Computing Concepts, Technology & Architecture]</p> |

| No. | Topics | Week | Remark |
|-----------------------------|--|------------|---|
| | Cloud Infrastructure Mechanisms | | Chapter 7 |
| 10. | 7.1 Logical Network Perimeter 7.2 Virtual Server 7.3 Cloud Storage Device 7.4 Cloud Usage Monitor 7.5 Resource Replication 7.6 Ready-Made Environment Summary of key points and presentation Hands-on Lab | Week 11-12 | Explain it in detail. [Cloud Computing Concepts, Technology & Architecture] |
| Lecture Plan for IoT | | | |
| | The Era of Internet of Things: Reference 1 | | |
| 11. | 1. Introduction to IoT 2. SWOT Analysis of IoT 3. IoT Physical Layer | Week 13 | Explain it in detail. [The Era of Internet of Things] |
| 12. | IoT Networking and Communication Layer | | |
| | 1. Wired Communication and Networking 2. Wireless Communication and Networking 3. Storage and Data Analytics 4. The DNA of IoT 5. Middleware and Protocols | Week 14-15 | Explain it in detail. [The Era of Internet of Things] [The Internet of Things in the cloud] |
| 13. | IoT Application Layer: Reference 2 | | |
| | Case Studies and Real Applications 1. Smart Parking in Cloud-Based IoT 2. Home Automation in Cloud-Based IoT 3. Presentation (Proposed IoT Application - Group) | Week 16 | Explain it in detail. [The Era of Internet of Things] Assignment II |
| 14. | Revision All | | |

Assessment Plan for the Course

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|--------------------------|------|
| Assignment/Tutorial/Quiz | 20 % |
| Term Paper (or) Lab | 20 % |
| Paper Exam | 60 % |