

SEC201	Emerging Technologies and Applications	1L:0T:2P	2 Credits
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Course Objective:

- To provide a comprehensive understanding of emerging technologies such as block chain, IoT, cloud computing, robotics, AR/VR, etc.
- To explore the applications, implications, and strategic advantages of emerging technologies in business for competitive advantage.

Contents:

Unit-1: Cloud Computing

Cloud service models (IaaS, PaaS, SaaS) – Deployment models (public, private, hybrid)
 - Cloud-based -enterprise solutions – Cost-benefit analysis and scalability – Security and Governance – Data security and compliance in the cloud – Cloud governance frameworks

Unit-2: Internet of Things (IoT) & Industry 4.0

Sensor technologies and connectivity-IoT Applications in Smart cities and infrastructure – Industrial IoT and manufacturing – IoT data processing and storage –Real-time analytics and decision-making – Concept of Industry 4.0 – Automation and smart manufacturing –Cyber-physical systems and digital twins –Robotics and advanced manufacturing technologies – Impact on Business Models – Transformation of production and supply chains – Business process optimization

Unit-3: Blockchain Technology

Fundamentals of Block chain – Decentralization and distributed ledger – Cryptography and consensus mechanisms – Smart contracts – Financial services and digital identity – Challenges and Opportunities – Security and privacy issues – Regulatory and compliance considerations

Unit-4: Augmented Reality (AR) and Virtual Reality (VR)

Introduction to AR/VR – Key concepts and differences between AR and VR – Historical development and current state - AR/VR applications in marketing and customer experience – Training and development through immersive technologies – Challenges and Opportunities – Technological limitations and advancements – Integration with existing business processes.

Practical (Suggestive List):

- Hands-on sessions on utilizing popular cloud platforms for development and deployment, offering hands-on experience with free tiers and trial accounts.

- Hands on sessions on block chain technologies, focusing on the basics development and deployment of decentralized applications.

Readings:

TextBooks(LatestEditions):

1. Emerging Technologies by Errol S. van Engelen
2. Internet of Things by Jeeva Jose, Khanna Book Publishing.
3. Digital Transformation: A Strategic Approach to Leveraging Emerging Technologies, Anup Maheshwari
4. Virtual & Augmented Reality by Rajiv Chopra, Khanna Book Publishing.
5. Emerging Technologies for Effective Management by Rahul Dubey, Cengage Publications.
6. IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things by David Hanes, Jerome Henry, Rob Barton, Gonzalo Salgueiro and Patrick Grossetete.
7. Blockchain for Business by Jai Singh Arun, Jerry Cuomo and Nitin Gaur.
8. Blockchain & Cryptocurrencies by Anshul Kausik, Khanna Book Publishing.
9. Industry 4.0 Technologies for Business Excellence: Frameworks, Practices, and Applications by Edited By Shivani Bali, Sugandha Aggarwal, Sunil Sharma.
10. Blockchain, Artificial Intelligence, and the Internet of Things: Possibilities and Opportunities" by Pethuru Raj, Ashutosh Kumar Dubey, Abhishek Kumar, Pramod Singh Rathore.

Readings:

- Abdi, S., Kitsara, I., Hawley, M.S., & de Witte, L.P. (2021). Emerging technologies and their potential for generating new assistive technologies. *Assistive Technology*, 33(sup1), 17–26. <https://doi.org/10.1080/10400435.2021.1945704>
- Seokbeom Kwon, Xiaoyu Liu, Alan L. Porter, Jan Youtie, Research addressing emerging technological ideas has greater scientific impact, *Research Policy*, Volume 48, Issue 9, 2019, 103834, <https://doi.org/10.1016/j.respol.2019.103834>.
- Philip, J. (2022), "A perspective on embracing emerging technologies research for organizational behavior", *Organization Management Journal*, Vol. 19 No. 3, pp. 88-98. <https://doi.org/10.1108/OMJ-10-2020-1063>

eStudies

1. Software and/or Data: Dilemma in an AI Research Lab of an Indian IT Organization, Rajalaxmi Kamath; Vinay V Reddy, <https://hbsp.harvard.edu/product/IMB889-PDF-ENG?Ntt=emerging%20technologies>
2. Volkswagen Group: Driving Big Business With Big Data, Ning Su; Naqaash Pirani, <https://hbsp.harvard.edu/product/W14007-PDF-ENG?Ntt=emerging%20technologies>

Course Outcomes:

1. Students will **understand** foundational knowledge of emerging technologies such as blockchain, IoT, cloud computing, AR/VR, etc., comprehending their principles, components, and functionalities.
2. Students will **analyze** the practical applications of these technologies in various business contexts, evaluating how they can optimize operations, enhance decision-making, and drive innovation.
3. Students will **evaluate** the strategic implications of adopting emerging technologies, including potential challenges, risks, and opportunities, to formulate informed strategies for competitive advantage.
4. Students will develop skills to plan and manage the integration of emerging technologies into business processes, ensuring alignment with organizational goals and effective change management.