21CSE19	AUGMENTED REALITY	L	T	P	C
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Course Objectives

- To introduce Augmented Reality, the tool of Industry 4.0
- To describe the history and recent developments of AR
- To provide the technological components needed for AR
- To impart the importance of augmented reality in Industry 4.0 with real-time examples
- To discuss the revolution and impact of AR
- To understand the applications of AR and VR

UNIT I	INTRODUCTION TO AUGMENTED REALITY	9 Hours

History of AR - Augmented reality characteristics – Difference between Augmented Reality and Virtual Reality – AR technological components – Technologies used in AR – Feature Extraction – Hardware components – AR devices – Importance of AR - Real world uses of AR – AR types – Software tools available for AR

UNIT II	TECHNOLOGIES NEEDED FOR AUGMENTED REALITY	9 Hours

Hardware technology – virtual scenes – 3D objects – AR components – Display – HMD – Eyeglasses Contact Lenses – significance of AR – AR powered devices – AR application development drawbacks Compatibility – Performance – AR libraries – Motion tracking – Environmental understanding – Anchors

UNIT III	TECHNOLOGY INTEGRATION AND IMPLEMENTATION OF AR	9 Hours

Technology use and integration in industrial settings – Assistive training to faculty members – Planning and administration for implementation – AR implications – Practical data – AR labs – Platforms to form AR content – Coordinated utilization of AR application s – Hands-on preparation

UNIT IV	AUGMENTED REALITY AND VIRTUAL REALITY FOR MICRO LEARNING	9 Hours

Micro learning techniques – Utilizing VR for learning – VR for Practical online assessment – VR info graphics – Virtual case considerations - Utilizing AR for learning – Accessible learning – sensible data elevated learner engagement - VR technology – Components of VR – VR Hardware – VR applications Civil Engineering – Real Estate – Biology and Medicine – Virtual Mall – VR in Education – Virtual Laboratory – Factory Planning – Automobile Industry

UNIT V	TOOLS AND APPLICATIONS OF AUGMENTED REALITY	9 Hours

Tools available for Augmented Reality and Recognition – Software Tools – Google Poly – Unity – software approaches – recognition types – native software solutions – ARKit – ARCore – software development kit - Cloud services - AR business applications – weather prediction – market prediction – smart cities - AR application for Education - AR application for Healthcare sector – Agriculture – Civil Engineering – Architecture – Archaeology – Crime and Security – Games – IoT - – Use cases – Social Media – Gaming – Education – Healthcare – Shopping and Business

UNIT VI	CASE STUDY	

Case Study on real time application of Augmented Reality

TOTAL PERIODS: 45

Course Outcomes:

At the end of the course, Students can able to

- Know Augmented Reality, the tool of Industry 4.0
- Understand history and recent developments of AR
- Learn technological components needed for AR
- know the importance of augmented reality in Industry 4.0 with real-time examples

Text books:

1. Kaliraj, P., Devi, T. (2021). Innovating with Augmented Reality: Applications in Education and Industry (P. Kaliraj, Ed.) (1st ed.). CRC Press, Taylor & Francis Group, Boca Raton, ebook ISBN 9781003175896 Auerbach Publications. https://doi.org/10.1201/9781003175896

Reference Books:

1. Schmalstieg, D., Höllerer, T., (2016), "Augmented Reality: Principles & Practice," Pearson, ISBN: 9789332578494
2. Craig, A. B., (2013), "Understanding Augmented Reality, Concepts and Applications," Morgan Kaufmann, ISBN: 9780240824086