



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF MECHANICAL ENGINEERING

19MEE403 - Industrial Digitalization

IV YEAR / VII SEM

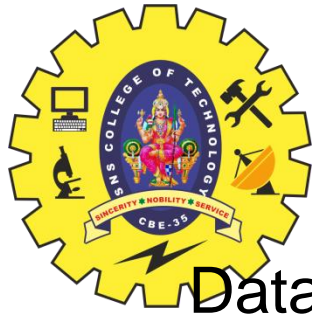
UNIT 4 - INDUSTRY 4.0



INTELLIGENT DIAGNOSTICS



Intelligent Diagnostics refers to the use of advanced technologies such as artificial intelligence (AI), machine learning (ML), and big data analytics to detect, diagnose, and predict faults or anomalies in systems and processes. This approach is increasingly being adopted across various industries to improve the accuracy, speed, and efficiency of diagnostics, leading to better decision-making and reduced downtime.



INTELLIGENT DIAGNOSTICS - APPLICATION



Data Collection and Monitoring:Description: Intelligent diagnostics relies on the continuous collection of data from sensors and devices monitoring the system's performance, health, and environment.

Machine Learning Algorithms:

Description: ML algorithms analyze the collected data to identify patterns and correlations that may indicate potential faults or issues.

Real-Time Analytics: Real-time analytics involves processing data as it is generated, allowing for immediate detection of anomalies and rapid diagnosis.

Predictive Maintenance: Predictive maintenance uses intelligent diagnostics to predict when equipment or systems are likely to fail, allowing maintenance to be scheduled before the failure occurs.

Fault Detection and Isolation:

Intelligent diagnostics systems can detect faults, isolate the root cause, and suggest corrective actions. This process often involves comparing real-time data against known fault patterns or models..

Self-Learning Systems:Description: Self-learning diagnostic systems can adapt and improve their performance over time by learning from new data and experiences.

Human-Machine Collaboration:Description: Intelligent diagnostics often involve collaboration between AI-driven systems and human experts, where the system provides insights and recommendations



INDUSTRY 4.0



1st Industrial Revolution:

Began in the 18th century with steam power and mechanization. Mechanized spinning wheels increased thread production, and steam engines replaced muscle power, enhancing productivity. Innovations like the steamship and locomotive revolutionized transportation, enabling longer-distance travel and goods movement.

2nd Industrial Revolution:

Started in the 19th century, marked by electricity and assembly line production. Inspired by conveyor belt systems in slaughterhouses, Henry Ford applied similar principles to automobile manufacturing, drastically improving efficiency and reducing costs with specialized, step-by-step production processes.

3rd Industrial Revolution:

Emerged in the 1970s with the advent of computers and programmable controls, allowing full production automation. Robots and computerized systems could operate independently of human intervention, performing complex manufacturing tasks.

4th Industrial Revolution (Industry 4.0):

Current phase, characterized by the integration of information and communication technologies into manufacturing. Building on the third revolution, it introduces interconnected and intelligent systems, enabling smart factories where machines, systems, and humans communicate seamlessly. This revolution enhances automation, predictive maintenance, and efficient, flexible working environments, transforming how products are made, serviced, and improved.



Thank You

