

GEE11012	Disruptive Technology Innovations	L	T	P	C
Version 1.0	Contact Hours - 45	1	0	2	2
Pre-requisites/Exposure					
Co-requisites	--				

Unit 1: AI/ML lecture:10

Introduction To Artificial Intelligence, Definition And Brief History Of Ai, Key Ai Concepts And Terminology, Importance And Impact Of Ai In Various Industries, Machine Learning Basics, Distinction Between Ai And Ml, Types Of Machine Learning: Supervised, Unsupervised, And Reinforcement, The Role Of Data In Machine Learning, Evaluation Metrics In Ml, Natural Language Processing (Nlp), Text Preprocessing And Tokenization, Basic Sentiment Analysis, applications Of Nlp In Real-world Scenarios, Generative Ai And Large Language Models, Introduction To Generative Ai, What Are Large Language Models?, Ai In Business And Industry, How Ai Is Transforming Various Industries (E.G., Healthcare, Finance, Retail), Case Studies Of Successful Ai Implementations, Business Opportunities And Challenges In Ai Adoption, Ai Ethics And Bias, The Importance Of Ethics In Ai, Ethical Considerations In Ai Development And Deployment

Unit 2: Data Analytics With Tools: lecture:6

Introduction To Data Analytics, The Importance Of Data In Decision-making, Types Of Data (Structured Vs. Unstructured), Role Of Data Analytics In Various Industries, Data Collection And Preprocessing, Data Collection Methods, Data Cleaning And Quality Assessment, Dealing With Missing Data, Data Transformation And Feature Engineering, Introduction To Data Analytics Tools, Overview Of Popular Data Analytics Tools, Introduction To Microsoft Excel For Data Analysis, Data Visualization With Advanced Tools (E.G., Tableau, Power Bi)

Unit 3:IOT lecture:10

Introduction To Iot, Definition And Concept Of The Internet Of Things, Significance And Impact On Various Industries, Iot Architecture And Components Overview, Iot Hardware Components (Sensors, Actuators, Microcontrollers), Basics Of Cloud Computing And Iot, Sensors And Actuators, Types Of Sensors (Temperature, Humidity, Motion, Etc.), Sensor Characteristics And Selection Criteria, Actuators And Their Role In Iot Systems, Practical Sensor And Actuator Examples, Iot Applications In Healthcare, Remote Patient Monitoring, Wearable Health Devices, Smart Cities, Agriculture And Environmental Monitoring, Augmented Reality (Ar) And Virtual Reality (Vr) In Iot, Digital Twins In Iot, Basics Of Arduino And Raspberry Pi, Hardware Components And Capabilities, Programming With Arduino Ide And Raspberry Pi, Hands-on Exercises With Arduino And Raspberry Pi

Unit 4: Cyber Security lecture:9

Introduction To Cybersecurity, Definition And Scope Of Cybersecurity, Historical Perspective And Evolution Of Cybersecurity, Cyber Threats And The Need For Protection, Overview Of Common Cyber Threats (Malware, Phishing, Ransomware, Etc.), Social Engineering Attacks, Confidentiality, Integrity, And Availability (Cia) Triad, Risk Assessment And Management, Security Policies And Procedures, Cybersecurity Best Practices, Security Technologies And Tools, Introduction To Antivirus Software, Firewalls And Intrusion

Detection/Prevention Systems (Ids/Ips), Encryption And Secure Communication, Application Of Cybersecurity In Business, Healthcare, Finance, Critical Infrastructure, Emerging Trends In Cybersecurity (Ai In Cybersecurity, Iot Security, Etc.)

Unit 5: Robotic Process Automation lecture:6

Definition Of Robotics And Automation, Historical Overview Of Robotics, Types Of Robots And Their Applications, Role Of Automation In Various Industries, Current Trends And Future Prospects, Robot Anatomy, And Components, Sensors: Proximity, Vision, Force, Touch, Etc, Actuators And Motors: Dc Motors, Servos, Stepper Motors, Robot Programming: Python, C++, Etc, Introduction To Computer Vision, Types Of Robot End-effectors/Grippers, Pick-and-place Operations, Introduction To Cobots (Collaborative Robots), Safety Considerations And Standards, Emerging Trends And Research Areas: Soft Robotics, Swarm Robotics, Bio-inspired Robotics, Industry 4.0 And Smart Factories.

Unit 6: Additive Manufacturing (Am) And Rapid Prototyping (Rp) lecture:6

Evolution And History Of Am And Rp, Basic Principles Of Am And Rp, Comparison With Traditional Manufacturing Methods, Applications And Benefits Of Am And Rp, Stereolithography (Sla), Fused Deposition Modeling (Fdm), Selective Laser Sintering (Sls), Selective Laser Melting (Slm), Electron Beam Melting (Ebm), Materials For Am: Polymers, Metals, Ceramics, And Composites Used In Am, Applications Of Am And Rp: Aerospace And Automotive Industries, Medical And Healthcare Applications, Consumer Goods And Electronics, Art And Fashion, Customization And Personalization, Tooling And Jigs.

Relationship between Course Outcomes (COs) and Program Outcomes (POs):

Legend for Mapping

1 = Weakly Mapped

2 = Moderately Mapped

3 = Strongly Mapped

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO1: Understand key concepts and applications of disruptive technologies in AI/ML, IoT, and Cybersecurity.	3	3	2	2	3	1	1	-	-	2	1	2	3	2	3
CO2: Apply knowledge of data analytics tools and methods for effective	3	3	3	2	3	1	1	-	2	-	2	2	3	2	2

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
decision-making.															
CO3: Develop prototypes and IoT	3	2	3	3	3	-	2	-	2	1	3	2	3	3	3

solutions using hands-on exercises with Arduino and Raspberry Pi.															
CO4: Understand cybersecurity threats and apply protection mechanisms in real-world scenarios.	3	3	3	3	3	3	2	2	1	1	2	3	3	3	3
CO5: Analyze and implement automation solutions using Robotic Process Automation.	3	3	3	2	3	1	-	-	-	-	3	2	3	2	2
CO6: Understand the principles and applications of Additive Manufacturing (AM) and Rapid Prototyping (RP).	3	3	3	3	3	1	1	-	2	-	3	3	3	2	2