Multidisciplinary Engineering Applications of Artificial Intelligence in Design Control and Infrastructure Systems

Chapter	Title	Page No.
1	Artificial Intelligence in Predictive Maintenance and Failure Diagnosis of Rotating Mechanical Components	13
2	Deep Learning Based Process Optimization in Additive Manufacturing and Metal Forming Operations	44
3	Al Powered Fault Detection and Grid Load Forecasting in Smart Power Distribution Networks	76
4	Reinforcement Learning Algorithms for Control Optimization in Embedded and IoT Based Electrical Systems	107
5	Natural Language Processing and Transformer Models for Intelligent Software Development Tools	138
6	Generative AI and Code Synthesis Frameworks for Automated Software Engineering and Debugging	167
7	AI Based Structural Health Monitoring and Crack Detection in Concrete Infrastructure	196
8	Machine Learning for Smart Traffic Management and Urban Infrastructure Planning	225
9	Artificial Intelligence in Legal Document Analysis and Predictive Case Outcome Modelling	258
10	AI Ethics and Legal Accountability in Engineering Decision Support Systems	288
11	Al Guided Drug Repurposing and Predictive Pharmacokinetics in Early Phase Clinical Trials	315
12	Machine Learning in Formulation Development and Optimization of Controlled Drug Delivery Systems	341
13	Al Based Diagnostic Imaging and Decision Support for Neurological and Cardiovascular Disorders	365
14	Deep Learning for Real Time Patient Monitoring and Emergency Response Prediction in Smart ICUs	392
15	Al Integration Frameworks for Interdisciplinary Collaboration in Engineering Projects	418
16	Al Governance and Regulatory Compliance in Safety Critical Engineering Systems	450
17	Sustainable Engineering Design Using AI Driven Multicriteria Decision Making Techniques	480