

The logo for ITM University, featuring the letters 'ITM' in a stylized, bold font with horizontal lines through them.

UNIVERSITY

GWALIOR • MP • INDIA

"CELEBRATING DREAMS"

Advances in
**Sciences, Engineering
and Social Sciences**

ITM UNIVERSITY GWALIOR

Vol. - I



Advances in
Sciences,
Engineering
and
Social Sciences

Preface

The fields of science, engineering, and social sciences are cornerstones of advancement in the ever-changing landscape of human endeavor, helping to shape the trends of our collective future. Our view of the world is constantly being reshaped by the pursuit of knowledge and innovation in these fields, which also gives us the ability to tackle the many problems that face humanity.

The collection "Advances in Sciences, Engineering, and Social Sciences" is proof of the fields' never-ending pursuit of excellence and innovation. As editors, we are honored to present a wide range of contributions from renowned academics, practitioners, and researchers, each of whom brings a special set of insights and viewpoints that deepen our understanding of the world.

The readers will travel through the most recent discoveries and advancements covering a broad range of subjects within these pages. This collection highlights the diversity of human inquiry and inventiveness, ranging from state-of-the-art discoveries in quantum computing to environmentally conscious engineering solutions addressing societal challenges, and from subtle investigations of societal dynamics to creative approaches in governance and policy-making.

We think that the knowledge and idea sharing this collection promotes will not only spur more innovation but also meaningful cross-disciplinary discussion and cooperation.

By encouraging an interdisciplinary approach to inquiry and problem-solving, we can harness the combined knowledge of many viewpoints to tackle the intricate problems of our day.

As editors, we would like to express our sincere gratitude to each and every contributor whose commitment and knowledge have made this compilation possible. Their dedication to excellence and enthusiasm for knowledge advancement act as guiding lights that point us toward a better, more prosperous future.

We cordially invite readers to open their minds and be curious as they peruse the pages of "Advances in Sciences, Engineering, and Social Sciences," prepared to investigate the limits of human knowledge and creativity. I hope this collection acts as a spark for more research, learning, and cooperation, bringing us one step closer to realizing the infinite possibilities of human endeavour.

Contents

Foundations of Agroforestry: Principles and Practices for Sustainable Agriculture.....	1
Soil Health and Nutrient Cycling in Agroforestry-Based Agrifood Systems.....	6
Importance of Forest Genetic Resources Conservation for Agroforestry Systems.....	12
Surviving the Stress: Exploring Teak's Adaptive Mechanisms to Drought.....	17
Farmer-to-Farmer Extension for Effective Dissemination of Agroforestry	24
Biotechnological Strategies for Sustainable Agroforestry	30
Value Chain-Based Agroforestry Models Linking with Wood-Based Industry: An Innovation to Increase Income of Farmers	36
Gender Dynamics in Agroforestry Systems	42
Market Access and Value Chains in Agroforestry Products	47
Land Tenure Issues and Agroforestry.....	51
Financial Incentives for Agroforestry Adoption.....	56
Community-based Agroforestry Initiatives	61
Nanoparticles: Synthesis and Characterization.....	66
Nanoscale Tools and Techniques in Agriculture	73
Nanosensors for Monitoring Plant Health	80
Nanotechnology Applications in Crop Improvement	85
Nanotechnology for Sustainable Crop Production	90

Nanotechnology in Horticultural Crops.....	95
Nanotechnology in Precision Agriculture.....	100
Advances in Seed Packaging Technologies.....	105
Future Directions and Innovations in Seed Storage and Packaging.....	110
Impact of Climate Change on Seed Storage and Germination	117
Seed Storage and Packaging in the Context of Sustainable Agriculture	123
Water Conservation and Efficient Irrigation in Agriculture	129
Integrated Pest Management: Balancing Yields and Environmental Protection	136
Molecular Breeding for Stress Tolerance in Horticulture.....	143
Food Waste and Loss: Mitigation Strategies for Sustainable Food Systems	145
The Economics of Seed Storage and Packaging.....	151
Precision Agriculture: Optimizing Inputs and Resource Use	157
Molecular Breeding for Disease Resistance in Horticulture	163
Organic Farming and Agro ecology: Sustainable Alternatives	165
Molecular Breeding for Seed Quality Improvement	171
Vertical Farming and Urban Agriculture: Innovations for Food Production.....	173

Future Directions in Molecular Breeding for Abiotic Stress Tolerance.....	180
Hydroponics and Aquaponics: Controlled Environment Agriculture Systems.....	182
Evaluation in Agriculture through Molecular Breeding .	188
Genetically Modified Organisms (GMOS) In Agriculture: Benefits and Risks.....	194
Biofertilizers and Biopesticides: Sustainable Alternatives to Synthetic Inputs	200
Food Security and Nutrition: Addressing Global Malnutrition	206
Neem-Based Agroforestry Production Management in Central India.....	210
Protected Cultivation of Cucurbits.....	217
Integrating Crop Diversity and Tree Species for Enhanced Productivity.....	224
Water Management and Conservation in Agroforestry Systems	230
Automation and Control Systems Enhancing Efficiency and Productivity.....	238
Fisheries Science and Aquaculture	242
Vertical gardening presents a transformative approach to agricultural practices	247
Improved Resource Use Efficiency	252
Fish Anatomy and Morphology	255
Protected Cultivation of Medicinal Plants	260

Protected Cultivation of Flowering Plants	267
Protected Cultivation of Strawberries	276
Fish Reproduction and Breeding Techniques	280
Fish Biology and Physiology	286
Different Protected Structures and Raising Seedlings of Major Vegetables Grown Under Protected Cultivation: Capsicum.....	291
Fish Genetics and Genomics in Aquaculture.....	297
Biotechnology Applications in Aquaculture.....	302
Sustainable Fisheries Management.....	307
Open Water Aquaculture: Challenges and Opportunities	312
Fishery Resource Assessment and Stock Management ..	317
Advances in Fish Vaccination and Immunology	322
Aquaponics: Integrating Fish and Plant Production	326
Aquatic Plants and Their Role in Aquaculture	331
Canopy Architecture and Plant Growth.....	335
Digital Image Processing Techniques.....	342
Feature Extraction and Classification Methods	347
Fundamentals of Remote Sensing Technology.....	352
Geometric Correction and Spatial Registration	355
Image Acquisition and Preprocessing Techniques	360
Larval Rearing and Hatchery Management	363
Lidar Technology and Applications.....	367
Marine and Coastal Aquaculture	372

Multispectral and Hyperspectral Remote Sensing	377
Principles of GIS Data Structures	382
Radar Remote Sensing Techniques	385
Radiometric Corrections and Calibration	390
Satellite Sensors and Platforms.....	394
Spatial Interpolation and Modeling	397
Traditional and Indigenous Knowledge in Fisheries Management.....	401
UAVs and Remote Sensing Applications	405
Cultural Practices: Irrigation and Nutrient Management in Horticultural Crops	411
Weather Prediction and Climate Resilience	416
Integrated Pest and Disease Management in Horticultural Crops.....	422
Nano-bio Interactions in Plant Systems	429
Nanomaterials in Plant Disease Management.....	435
AI-Powered Soil Health Management	441
Water Resource Management with AI.....	448
Disease Detection and Pest Control Using AI	454
Predictive Analytics for Crop Yield Optimization	460
Sustainable Irrigation Practices Enhanced by AI.....	466
AI in Livestock Management.....	472
AI for Supply Chain Optimization in Agriculture	478
Sustainable Agroforestry with AI Tools	484
Evaluation in Agriculture through Drones.....	490

History and Evolution of Drones in Farming	495
Overview of Drone Technology in Agriculture.....	499
Current Trends and Future Prospects of Drones in Farming	504
Types of Drones Used in Agriculture	508
Blockchain and AI for Food Traceability	513
Rural Development and Sustainable Agriculture: Linking Production and Livelihoods	519
Canopy Management and Agroforestry Systems	523
Canopy Management for Forest Health and Productivity	528
Canopy Management in Orchards and Vineyards	534
Robotics and Automation in Agriculture: Enhancing Efficiency and Productivity	540
Consumer Demand and Sustainable Food Choices: Ethical Consumption.....	544
Agricultural Policy and Food Security: Promoting Sustainable Practices.....	551
Canopy Management in Urban Landscapes	558
Environmental and Climatic Considerations in Canopy Management.....	563
Future Challenges and Opportunities in Horticulture.....	569
Ethical and Regulatory Issues in Nanotechnology Applications	575
Future Directions and Challenges in Nanotechnology for Horticulture	580

Agricultural Biotechnology	585
Organic Farming	589
Fair Trade and Ethical Sourcing: Promoting Sustainable Food Chains	593
Genetic Resources and Breeding in Horticultural Crops	599
Global Trade and Economics of Horticultural Crops	604
Agroforestry Systems.....	611
Sustainable Agriculture Practices	615
Soil Fertility and Nutrient Management	619
Technological Innovations and Agroforestry Policies....	623
Environmental Benefits and Policy Implications of Agroforestry	631
Social Equity and Inclusion in Agroforestry Development	638
Early Agricultural Practices and Selection	646
Ancient Greek and Roman contributions to understanding inheritance.....	651
Gregor Mendel's experiments with pea plants	656
Mendel's Laws of Inheritance	660
Rediscovery of Mendel's work in the early 20th century	665
Crop Protection and Disease Management	669
Post-Harvest Technology and Management	674
Agroclimatology	679
Farming Systems and Farm Management.....	685
Soil Conservation and Management	690

AI in Organic Farming.....	695
Renewable Energy Solutions in AI-Driven Farms	700
Urban Farming and Vertical Agriculture Technologies .	706
Economic Impacts of AI on Agriculture.....	712
Ethical Considerations in AI Agriculture	716
CRISPR-Cas9-Based Genome Editing Approaches in Plant Mutation Breeding	720
Improving Crop Nutrition through Radiation-Induced Mutations	723
Improving crop nutrition through radiation induced mutation	726
Bio-stimulants for Improved Nutrient Uptake.....	731
Bio-stimulants and Crop Yield Enhancement.....	737
Effect of Bio-stimulants on Crop vegetative and Nutritional Quality Improvement	742
Bio-stimulants as Alternatives to inorganic Fertilizers...	747
Bio-stimulants and Integrated Pest Management	752
Economic Benefits of Using Bio-stimulants.....	756
Challenges in Bio-stimulant Efficacy	760
Regulatory Framework for Bio-stimulants	765
Impact of Application of Mutagenesis in Developing Salt- Resistant Crops	769
Optimizing Mutation Induction Techniques for Genetic Improvement	775
Mutagenic Effectiveness and Mechanisms of Mutation.	782

Role of Mutations in Developing Herbicide-Tolerant Crops	788
Strategies for Detecting Mutations in Plant Breeding	795
Genome-Wide Approaches to Identify and Utilize Induced Mutations in Crops.....	801
Mutation Breeding: Prospects for Developing Drought-Resistant Crops	808
Gene Editing Technologies for Precision Mutation Breeding.....	815
Bioinformatics in Mutation Breeding: Tools and Applications	820
Agroforestry and Food Security.....	825
Agroforestry and Rural Livelihoods	830
Climate Change Impacts on Agriculture and Food Security	834
Biodiversity Loss and Its Implications for Agriculture ..	840
Soil Health and Nutrient Management for Sustainable Agriculture	846
Physical Mutagenesis in Plant Breeding.....	852
Significance of Induced Mutagenesis in Crop Improvement	856
Radiation as a Mutagenic Factor in Plant Mutation Breeding.....	860
Importance of Uncovering Somaclonal Variations in Crop Improvement	865
Impact of Induced Mutagenesis on Crop Biodiversity ...	870

Overview of Molecular Breeding in Agriculture	876
Molecular Breeding for Disease Resistance	879
Enhancing Abiotic Stress Tolerance through Molecular Breeding.....	882
Nutritional Enhancement of Crops Through Molecular Breeding.....	885
Integrating CRISPR-Cas9 in Molecular Breeding.....	888
Food Security and Agricultural Resilience in Conflict Zones: A Complex Interplay of Challenges and Opportunities.....	891
Sustainable Agriculture in the Global North: Transitioning to Agroecological Systems	897
Circular Economy and Sustainable Agriculture: Closing Food System Loops.....	904
Innovations in Food Processing and Preservation: Reducing Waste and Enhancing Nutrition	910
Education and Capacity Building for Sustainable Agriculture: Fostering a New Generation of Farmers	918
Bio-stimulants in Seed Treatment.....	924
Bio-stimulants in Hydroponics and Soilless Systems.....	929
Agronomy of Major Cereal Crops	935
Challenges and Limitations of AI in Agriculture	939
Classification of Bio-Stimulants.....	943
Crop Modeling and Simulation.....	951
Forage and Pasture Management	956
Future Trends and Innovations in AI for Agriculture.....	961

Historical Development of Bio-stimulants	965
Impact of Canopy Management on Yield and Quality ...	970
Introduction to Bio-stimulants: Concepts and Definitions	975
Legume Crop Production	980
Microbial Bio-stimulants: Beneficial Bacteria	984
Microbial Bio-stimulants: Mycorrhizal Fungi	992
Mutation Techniques to Enhance Nutritional Content in Staple Crops	998
Oilseed Crop Production.....	1001
Policy and Regulatory Frameworks.....	1006
Potential of Induced Mutagenesis in Creating Novel Traits in Horticultural Crops	1010
Role of Mutations in Developing Disease-Resistant Crops	1014
Sustainable Agriculture and need of Sustainable Agriculture	1017
The Role of AI in Modern Agriculture	1022
Towards a Sustainable Agricultural Future	1027
Work of early plant breeders like Luther Burbank	1030
Early Agricultural Practices and Selection	1034
Development of hybrid crops.....	1039
Seed Certification Systems and Their Implementation	1043
Intellectual Property Rights and Seed Innovation	1048
Seed Policies for Climate Resilience	1054

Seed Certification and Trade: International Perspectives	1060
Technological Advancements in Seed Certification.....	1065
Soil Property Mapping with Drone Technology.....	1071
Precision Agriculture: Soil Sampling and Analysis through Drone.....	1076
Enhancing Soil Health through Drone Data	1081
Optimizing Irrigation Systems through Drone	1086
Water Stress Detection and Management	1091
Introduction to Agronomy	1096
Soil Science and Agronomy.....	1100
Crop Physiology.....	1105
Plant Genetics and Breeding.....	1110
Crop Ecology and Agroecosystems	1115
Soil Ecosystem Services and Agricultural Sustainability in Sub-Humid Single and Mixed Agroforestry Systems at the Foothills of Eastern Himalayan Region, India.....	1121
Policy Frameworks and Agroforestry: A Global Perspective	1129
Protected Cultivation of Vegetable Science Production	1136
Aeroponics of Vegetable Crops: Tuber, Leafy Vegetable, Cole Crops, Cucurbits, and Medicinal Plant Production	1146
Hydroponics, a soilless agricultural technique	1150
National Legislation Developments.....	1155
Intellectual Property Rights and Biotechnology.....	1160

Seed Certification Systems	1165
International Seed Trade Regulations	1172
Intellectual Property Rights in Seed Industry	1181
The work of Thomas Hunt Morgan and the fruit fly experiments	1187
Discovery of Chromosomes and Their Role in Inheritance	1191
Linkage and genetic mapping	1197
Discovery of the structure of DNA by Watson and C ..	1203
Contributions of Rosalind Franklin and Maurice Wilkins	1207
Introduction to Seed Storage and Packaging	1212
Historical Perspective on Seed Storage	1219
Seed Physiology and Quality	1222
Principles of Seed Storage	1226
Seed Packaging Technologies.....	1232
Seed Banks: A Crucial Tool in Biodiversity Conservation	1240
Effect of Sowing Methods on the Productivity of Soybean Variety Under Mango (<i>Mangifera indica L.</i>) Based Agri- Horticulture System	1245
Role of Accreditation Protocol in Agroforestry Nurseries for Quality Planting Material Production	1251
Seed Quality Assurance and Testing	1257
Seed Storage Techniques and Management	1264

Seed Germination: Mechanisms, Factors, and Techniques	1270
Seed Germination: Mechanisms, Factors, and Techniques	1275
Seed Policy, Regulations, and Global Governance	1280
Seed Security and Sustainability in a Changing Climate	1287
Seed Biotechnology: Innovations, Applications, and Ethical Considerations.....	1293
Protected cultivation of cole crops.....	1299
Vegetable crop production.....	1305
Data Analysis for Crop Forecasting.....	1312
Enhancing Crop Yield and Quality through Drone	1317
Targeted Pesticide Application through Drone.....	1322
Monitoring Soil Moisture Levels through Drone Data.	1327
Identifying Weed Infestations through Drone	1333
The Role of Seed Banks in Conservation and Agriculture	1338
Seed Quality Assurance and Testing: Methods, Standards, and Innovations.....	1344
Seed Storage and Packaging Innovations: Enhancing Viability and Quality.....	1350
Seed Legislation and Intellectual Property Rights: Global Perspectives and Challenges	1355
Discovery of the structure of DNA by Watson and Crick	1360

Molecular Breeding for Quality Traits in Horticultural Crops	1364
Bioinformatics and Computational Tools in Molecular Breeding	1366
Epigenetics in Molecular Breeding.....	1369
Molecular Breeding for Biofuel Crops	1372
Precision Agriculture	1382
Irrigation and Water Management	1387
Molecular Breeding for Disease Resistance	1392
Agricultural Meteorology	1394
Weed Science.....	1399
Molecular Breeding for Abiotic Stress Tolerance	1403
Molecular Breeding for Enhanced Quality Traits.....	1405
Molecular Breeding for Nutrient Use Efficiency.....	1407
Molecular Breeding for Crop Yield Improvement	1409
Molecular Breeding for Crop Quality Improvement in Horticulture	1411
Molecular Breeding for Pest Resistance	1413
Molecular Breeding for Herbicide Resistance	1415
Molecular Breeding for Biofortification.....	1417
Molecular Breeding for Hybrid Seed Production	1419
Historical Perspectives on Agriculture and Technology	1421
Fundamentals of Artificial Intelligence	1427

Machine Learning Basics for Agricultural Applications	1434
Non-microbial Bio-stimulants: Humic Substances.....	1440
Seaweed Extracts based Bio stimulants	1447
Bio-stimulants rich in Amino Acids and Peptides	1451
Plant Hormones as Bio-stimulants.....	1455
Mechanisms of Bio-stimulant Action in Plants	1460
Economic Viability of Agroforestry Practices in Modern Agrifood Systems.....	1465
Community Engagement and Policy Support for Agroforestry Adoption.....	1471
Future Directions: Innovations and Technologies in Agroforestry for Sustainable Agrifood Systems.....	1477
The Economic Impacts of Agroforestry Practices	1481
Social Dimensions of Agroforestry Adoption	1487
Bio-stimulants and Plant Metabolism.....	1491
Bio-stimulants and Plant Stress Tolerance	1496
Bio-stimulants and Soil Health	1501
Foliar Application of Bio-stimulants	1506
Soil Drenching Techniques.....	1511
Seed Certification Processes and Standards	1516
Emerging Trends in Seed Technology and Innovation.	1527
Seed Quality Assurance and Testing Methods	1533
Sustainable Seed Systems and Farmer Empowerment .	1539

Intellectual Property Rights and Plant Variety Protection	1545
Cracking the genetic code.....	1550
Discovery of RNA and its functions	1554
Advances in molecular biology techniques	1558
The Human Genome Project and Its Impact.....	1562
CRISPR and Gene Editing Technologies	1566
Advances in molecular biology techniques	1570
Applications of genomics in medicine and agriculture.	1573
Post-harvest Management and Storage of Horticultural Crops	1577
Propagation Techniques in Horticultural Crops	1584
Pruning Techniques and Practices	1589
The Impact of Gene Mutations on Health and Development	1596
Genetic Disorders: Causes and Consequences	1599
The Function and Composition of the Genome	1604
Correlating Mutations and the Path to Evolution	1611
The Functional Units of DNA: Genes and Mutant Alleles	1613
Sustainable Canopy Management Practices	1616
Sustainable Practices in Horticultural Crop Production	1622
Value Addition and Processing of Horticultural Produce	1628
Technological Advances in Canopy Management	1635

Challenges and Future Directions in Canopy Management	1641
AI-Driven Precision Farming	1647
Smart Sensors and IoT in Agriculture	1653
Big Data Analytics for Crop Management	1659
Drones and UAVs in Field Monitoring	1666
Robotic Harvesting Systems	1672
Introduction to Seed Legislation and Certification	1678
International Frameworks and Agreements	1683
Recent Advances in Bio-stimulant Research	1688
Future Trends in Bio-stimulant Development	1692
Practical Guidelines for Bio-stimulant Use in Agriculture	1696
Malfunction and Missing Proteins Due to Gene Mutations	1700
Mechanisms of Protein Malfunction and Deficiency ...	1703
Historical Development of Mutation Breeding.....	1707
Opportunities and Challenges in Plant Mutation Breeding	1713
Chemical Mutagens for Induced Mutation	1720
The Global Food System: Challenges and Opportunities	1727
Sustainable Agriculture: Defining Principles and Practices	1732
The role of botanical gardens and agricultural institutions	1738

Application of Mendel's principles to plant breeding...	1742
Creation of Pure Lines and Hybrid Vigor.....	1747
Mutation Breeding and Induced Mutations	1752
Polyploidy in Plant Breeding	1757
Tissue Culture and Micropropagation	1761
Green Revolution	1765
Food System Governance and International Cooperation: Towards a More Equitable and Sustainable Future	1769
Future Directions in Plant Breeding	1775
Modern Plant Breeding	1779
Gender Equality and Women's Role in Sustainable Agriculture	1783
Climate-Smart Agriculture in Arid and Semi-Arid Regions: Challenges and Opportunities for Sustainable Food Security	1789
Sustainable Agriculture in Developing Countries: Challenges and Solutions	1796
Sensor Technologies and Their Applications	1802
Multispectral and Hyper-spectral Imaging	1806
Sustainable Agriculture in Urban Environments: Feeding Cities with Eco-Friendly Solutions	1812
Software and Data Processing Techniques in Agriculture	1818
Early Detection of Crop Diseases and Pests through Drone	1824

Vegetation Indices and Their Interpretation through Drone	1829
Study of Nanoparticles.....	1835
Corona virus: Global Pandemic	1842
Noise Pollution and its preventions	1847
Plastic pollution and its preventions	1852
A study on use of Quarry dust as fine aggregate in mortar.....	1857
Soil stabilization: materials, properties, and techniques ...	1862
Behaviour of Eccentrically Loaded Shallow Foundations on Granular Soil.....	1866
Pushover Analysis of Steel Frames.....	1871
Development of “Green” Cement for Sustainable Concrete Using Cement Kiln Dust and Fly Ash	1877
Effect of Lime and Fly ash on Cation Exchange Capacity (CEC) and Unconfined Compressive Strength (UCS) of Soils	1881
Investigation of Fly ash Polymer Composite.....	1885
Comparative Study of Cost Efficiency of Green Materials for Residential Buildings	1890
Development of High Early-Strength Concrete for Bridge Construction.....	1895
A study on use of Quarry dust as fine aggregate in mortar.....	1899
Satellite remote sensing of forest resources: three decades of research development.....	1904
Thermal and sound performance of new PVC prefabricated wall panel for building	1908

The Art and Science of Vegetable Gardening	1914
The Breeding Aspects of Vegetable Crops: Enhancing Traits for Better Yields and Resilience	1920
Indian Rural Society	1926
Social Change	1931
Social Institutions.....	1936
Organic Farming in vegetables	1941
Abiotic Stress on Vegetable Plants	1945
Role of plant growth regulators in vegetable cultivation	1949
Indigenous Technical Knowledge in Plant Disease Management.....	1955
Integrated Disease Management of Late Blight of Potato	1960
Integrated Management of Fungal Diseases of Rice	1968
King of Arid Fruit: Ber	1984
Production Technology of Surinam Cherry Fruit	1989
Urban and Peri-Urban Horticulture	1994
Grassed Waterways.....	1999
Hydroponic System.....	2006
Impact of the Green Revolution in Agriculture	2012
Integrated Farming Systems: Principles and Practices .	2019
Integrated Nutrient Management: Principles and Practices	2026

Unlocking the Secrets of Jeevamrutha: A Path to Sustainable Agriculture.....	2033
Higher Education System	2037
Project Allocation System.....	2042
Smart Phone Forensic	2047
Anti Assignment Piracy System	2052
Assistive Monitoring System.....	2058
Data Dashboard.....	2064
E-Patra Application.....	2070
Train Ticket Reservation System.....	2075
Personalized News Recommendation App.....	2081
Exam cell Automation system	2086
Tempverse.....	2092
Empowering Digital Well-being and Personalized Recommendations.....	2101
SMS Spam Detection.....	2106
Predicting Student Performance using Regression analysis	2111
Surveillance system based on real time object detection	2118
Startup Success Prediction.....	2124
Video Conferencing App	2131
Enhancing Security and Privacy in Cloud Computing Environments	2137

A Comprehensive Analysis of Cloud Service Models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).....	2141
Optimizing Efficiency: A Research Perspective on Resource Allocation and Scheduling.....	2145
Energy Efficiency and Green Computing: Navigating Towards a Sustainable Digital Future.....	2149
Cloud Computing Adoption in Healthcare	2153
Sentiment Analysis in Social-Media.....	2157
Renewable Energy Integration in Healthcare Clouds...	2160
Ethical and Fairness Issues in Sentiment Analysis	2164
Energy-aware Task Scheduling in Healthcare Clouds..	2167
Sentiment Analysis in Healthcare	2171
Overview of Cyber Security	2175
Technology behind AI Text Generators	2179
Security Challenges in IoT Networks: Risks, Vulnerabilities, and Mitigation Strategies	2183
Women Security Website	2188
Advance Exploit Development.....	2197
Better career and job suggestion.....	2202
Online Auction System.....	2208
Understanding and Mitigating Cyber Threats in the Digital Age.....	2214
The Evolution and Impact of Generative AI: Transformations and Future Directions	2218

The Use of Machine Learning in Healthcare: Transforming Patient Care and Medical Practices.....	2223
ABHI Finder Mobile Application.....	2227
Advanced Vulnerability Exploitation Research.....	2232
Banking Management System	2238
Block chain Based D App.....	2243
Clothing E-Commerce Website	2248
Crop Disease Detection System.....	2253
Cyber Security Challenges and Emerging Trends in Latest Technologies	2258
Cyber security: A Comprehensive Study.....	2262
Food Ordering System with QR Code	2265
Game Maker Studio	2269
IoT Security: Issues and Challenges	2273
Latency Reduction Model for Edge Computing	2280
Learning Algorithms for Data Encryption.....	2287
Project Allocation System.....	2291
Revolutionizing Cybersecurity with AI: Benefits, Challenges, and Future Prospects	2297
SaaS Spectrum	2301
The Impact of AI on Financial Markets: Applications, Challenges, and Future Prospects	2306
The Impact of Artificial Intelligence on Interactive Entertainment: A Focus on Gaming	2311

A numerical study of natural convection around a square, horizontal, heated cylinder placed in an enclosure	2315
Multi-objective optimization of turning operation of Stainless Steel using a Roulette Wheel Optimization Algorithm	2321
A review on artificial bone modelling: Materials and manufacturing techniques	2329
A Review Paper on Biomechanical Analysis of Human Femur	2342
Application of Machine Learning in Mechanical Engineering	2352
A Review on Tribological and Mechanical Properties of Ternary Nitride-Based Coatings	2356
Soil-structure Interaction Taken into Account in Characterizing the Behavior of Flexible Piles	2360
Fatigue Behavior of Copper Under Rotating Bending with Constant Reversed Amplitude	2368
Simulation of estimation of lubricant film thickness in engine shaft	2375
Working mechanism of cam and tappet.....	2380
Roll of cam and tappet in internal combustion engines	2384
Role of signal processing and artificial intelligence on Condition Monitoring of Bearings.....	2388
Advancements in Additive Manufacturing: Current State and Future Directions.....	2393
Fault Diagnosis in Gears Using Acoustic and Vibration Signals.....	2400

Application of Robot Welding Technology.....	2405
Dynamic fracture behavior of additively manufactured composite materials	2416
Green Hydrogen - The Clean Fuel for a Sustainable Future	2421
Cogeneration - Harnessing the Power of Combined Heat and Power.....	2425
Waste Management in the Dairy Industry: A Sustainable Approach.....	2430
Biogas Production - A Sustainable Solution for the Future	2435
The Tundish: A Crucial Mediator in Continuous Casting	2440
Spur Gear Model Testing.....	2444
Performance of Additive Manufactured Spur Gears	2448
VA comparison between Sound and Vibration Sensors for condition monitoring.....	2453
Delving into the Microscopic: Ultra-Precision Machining	2457
Shaping Perfection: An Exploration of Diamond Turning Machines	2461
Unveiling the Magic of Fluids: Magneto-Rheological Finishing	2465
Key Parameters in Magneto-Rheological Finishing	2469
Boon to Outrun COVID-19 — Smart Trolley with Automated Billing System.....	2474

Automatic Call answering Machine by using Arduino and GSM module.....	2478
Call answering Machine by Arduino and GSM module.....	2481
Minimization of BER for 8 Users Optical Communication System.....	2485
Examination of Congestion in Channels for Vehicular Ad-Hoc Network VANET	2490
Optimizing Throughput and Spectral Efficiency in Cognitive Radio Networks Through Channel Allocation	2495
Error Analysis in Color Space Conversion: A Comparative Approach.....	2502
Batteries for Electric Vehicles	2508
Renewable Energy: A Pathway to a Sustainable Future.....	2513
Comprehensive Analysis of Available Transfer Capability (ATC) Calculation Methods	2520
The Role of Solar Power in Electrical Transmission Congestion Management	2524
Optimization of Voltage Stability and Power Loss Minimization Using Artificial Intelligence.....	2530
Bifacial Photovoltaic Technology.....	2534
Electric Vehicle Motors	2539
Electric Vehicle Charging Stations.....	2544
Energy Storage Systems	2548
Renewable Energy Tracking Systems: Maximizing Efficiency and Performance.....	2553

Solar Energy Tracking Systems: Enhancing Efficiency and Maximizing Output.....	2561
EV Motor Control and Efficiency.....	2568
An evaluation of electric vehicle models using photovoltaics to determine their suitability for integration into EV distribution networks.....	2573
Issues with Electrical Transmission System Congestion Management, Current Approaches, and Future Goals..	2579
Evaluation Of Curcumin Emulgel	2585
Ethics and Professionalism in Pharmaceutical Chemistry	2589
Evaluation of Microfluidic Devices for Drug Delivery Systems	2593
Recent Advances in Pharmaceutical Chemistry	2596
Simulation of bronchial mucociliary clearance of insoluble particles by computational fluid and particle dynamics methods.....	2600
Tablet Film Coatings: Applications in Medicine.....	2606
An in vitro investigation of Thymus vulgaris-mediated Selenium Nanoparticles' Antioxidant and Anti-inflammatory properties.....	2615
Novel Drug Delivery System: A Novel approach	2621
Aquasomes: A lipid based vesicular drug delivery system	2627
Osmotic Pump In Peptic Ulcer Disease	2635
Quality Control of Herbal Drugs: an overview.....	2641
Marine Herbal Drugs: A Treasure from the sea.....	2646

Neurological Disorder of Chorea: A Short Communication	2651
Rp-Hplc for Determination of Abacavir in Bulk Dosage Form Economically.....	2661
Ultra Violet Spectrophotometric Method, Method Validation Of Abacavir.....	2664
Ultra Violet Spectrophotometric Method, Method Validation Of Gliclazide	2669
Ultra Violet Spectrophotometric Method, Method Validation Of Glimperide	2674
Ultra Violet Spectrophotometric Method, Method Validation of Salbutamol	2679
Role of Novel Bioactive Phytoconstituents and Nutraceuticals from Citrus Food Wastes in Health Care Management.....	2684
महाभारत - पांडवों के संघर्ष की कहानी.....	2689
श्री भगवद् गीता का तृतीया अध्याय - मानव जीवन पर पड़ने वाले प्रभाव.....	2693
Unveiling the Wonders of Rhizobacteria.....	2697
Historical development and key development in quantum materials with references	2704
Quantum materials in energy	2709
Quantum Outlook: Gateway to the Future of Quantum Materials and Technology with references	2714
Effect of Food Grade Microplastics on Human Health	2719
Salinity Stress and Its Effect on Agriculture in Semi-arid Regions of India.....	2723

SDS-Polyacrylamide Gel Electrophoresis (SDS-PAGE): An Efficient Technique for Protein Isolation and Quantification	2728
Applications of Recombinant DNA Technology in Agriculture	2733
Green Manure: An Effective Measure for Enhancement of Crop Production	2739
Isolation and Enrichment Techniques for Pectinase Production	2744
<i>Simarouba glauca</i> : A Sustainable Approach for Phytoremediation	2748
Bioactive Compounds in <i>Simarouba glauca</i> : A Paradise Tree	2754
Chemical effect of fast food on children health,.....	2759
Batteries and Electronics.....	2763
The Future of Chemistry	2767
Forensic Crime Scene Investigation	2771
Forensic Ballistics: A Crucial Tool in Modern Criminal Investigations	2775
Advancements in Wildlife Forensic Techniques: Enhancing Conservation Efforts	2780
Introduction to Green Photonics	2784
Molecular Beam Epitaxy Technique for Thin Film Deposition	2787
The Beauty of Abstract Algebra: A New Approach.....	2792
Number Systems: A Competitive Approach.....	2797

Common Fixed-Point Theorems in Cone Metric Spaces: An Introduction.....	2800
Generalized Common Fixed-Point Theorems Using Common (CLR) Properties in Complex-Valued Metric Spaces	2804
Common Fixed-Point Theorems for Six Self Maps Using in Complex-Valued Metric Spaces for Weakly compatible mappings.....	2811
Enzymes: The Biological Catalysts of Life	2818
Mathematical Study of Blood Pressure.....	2824
Dynamics of Fungal infection: Mathematical model....	2830
Industrial Applications of Microbial Secondary Metabolite	2835
Application of Oleo gels in the Bakery Industry	2840
Adulteration in Spices.....	2845
Organoleptic Properties of Food.....	2850
Forensic Application of Next-Generation Sequencing (NGS).....	2856
How Does the Legal Framework for Forensic Science in India Compare to Those in Other Countries	2861
Forensic Entomology: Insect Evidence in Criminal Investigations	2866
Diatoms in Forensic Science and Its Applications	2872
The Crucial Role of Forensic Science in Shaping a Safer Society.....	2878
The Evolution and Impact of DNA Technology in Criminal Justice.....	2883

Microbial Production of Tetracycline	2888
Microbial production of Trypsin.....	2895
Molecular Docking and its Applications.....	2900
Moringa: The Miracle Tree And it's Multi-attributes ...	2903
Navigating Compliance: A Comprehensive Overview of GMO Regulation.....	2909
Role of Environmental Factors on the Development of PKDL	2913
Role of National Green Tribunal (NGT) in Rapid Justice for Environmental Issues	2918
Status of Women Participation in Environmental Conservation	2923
The Promise of Stem Cell Technology & Revolutionizing Medicine	2928
The Leafy Treasure: Nutritional and Botanical Aspects of Spinach.....	2932
Tools of Recombinant DNA Technology	2937
Tyre Pollution And Its Consequences	2943
कालिदास के साहित्य में प्रकृति और पर्यावरण का प्रेम: एक विस्तृत विश्लेषण.....	2948
Harnessing the Potential of Plant Growth-Promoting Rhizobacteria (PGPR) for plant health	2952
Advancing Agriculture: The Role of Nano Fertilizers in Sustainable Crop Production.....	2960
Impact of Adult Education Programs in Promoting Social Awareness	2965

Remote Sensing and Imaging Technologies in Plant Disease Detection.....	2970
The Role and Importance of Forage Crops in Sustainable Agriculture and Livestock Production	2976
Assessing Target Group Needs.....	2981
Innovative Water Conservation: Drip Irrigation for Modern Farming	2985
Alternative Approaches to Organizing Extension	2990
Agriculture and Agribusiness in India: An Entrepreneurial Development of Agriculture	2995
Agrochemicals' Effects on the Environment and Ecological Alternatives	3001
An Overview of Employment Opportunities in Rural India	3017
An Overview of Indian Agricultural Sector in Digital Age	3023
The Harmony of Biodynamic Farming: A Holistic Approach to Sustainable Agriculture.....	3030
Biotechnology And Genetic Engineering In Agriculture	3034
Brown Manurng: New Approach Towards Inm	3039
Bio-fertilizers an eco-friendly approach for nutrient management	3044
Introduction to Drainage Engineering	3051
Role of Remote Sensing (RS) and Geographic Information Systems (GIS) in Watershed Management	3056

Water Management: Principles, Challenges and Innovations.....	3060
Detailed Study of Hybrid Seed Production and Procedures in Cross-Pollinated Crops	3065
Design of Greenhouse.....	3074
Understanding Evapotranspiration.....	3081
Hydroponics	3087
Scope of Processing and Value Addition in the Present Era	3093
Scope Horticulture in the Present Scenario	3099
By-product/Waste Utilization for Doubling Farmers' Income.....	3104
Canopy management of temperate fruits	3108
Hi-tech cultivation of grapes.....	3116
PGPRs- Plant Growth-Promoting Rhizobacteria.....	3124
Role of Women in Agroforestry: Contributions, Challenges, and Opportunities	3131
Drone Applications in Agriculture and Agroforestry: Enhancing Productivity, Sustainability, and Precision .	3135
Role of Tribals in Forest Conservation.....	3139
Farm Inventory Management - Optimizing Assets for Sustainable Agriculture.....	3143
The Role of Cooperatives in India - Empowering Communities through Collective Action	3149
Farm Records - The Backbone of Efficient Farm Management.....	3155

Integrated Weed Management	3161
Integrated Farming System Models	3166
Choosing the Right Vegetables for Your Garden	3171
Enhancing Soil Fertility through Soil Microorganisms	3176
Fabrication of a Balanced Aquarium	3181
Fish Behaviour and Ecology	3186
Fish Migration and Habitat Connectivity	3192
Fish Preservation Methods.....	3198
Genomic Approaches for Groundnut Breeding: Biotic and Abiotic Stress Tolerance	3202
Heterosis and Male Sterility in Rice Breeding to Increase the Production of Crops	3210
Micro Irrigation Systems	3216
Organic Farming and Sustainable Development	3223
Paddy Cum Fish Culture.....	3229
Programme for Crop Improvement Applying Genomic Tools in Groundnut Breeding	3234
Quality of Irrigation Water for Sustainable Agriculture	3241
Reduced Resource Use in Agriculture: Nurturing Sustainability and Efficiency	3247
Regenerative Agriculture: Cultivating a Sustainable Future	3252
Restoration of Degraded Fish Habitats	3259
Seed Treatment for Boost the Crop Production.....	3265
Soil Chemistry and Climate Change.....	3272

Soil Microorganisms	3277
The Development of Seedless Fruits and Their Mechanisms	3282
The Effect of Drought on Seed Production in Cereal Crops	3287
The Future of Farming: Reaching New Heights with Vertical Farming and Controlled Environment Agriculture	3294
Water Potential: Concept, Components, and Relationship with Different Components.....	3302
Zero Budget Natural Farming: A Sustainable Agricultural Revolution.....	3308
Advances In Environmental Toxicology: Impacts, Mechanisms, And Management.....	3313
Comparative Review Of Active And Passive Biomonitoring Using Bryophytes	3318
The Environmental and Human Health Impacts of Pesticide Use in Agriculture.....	3325
The Role Of Bryophytes As Pollution Indicators	3332
The Symbiotic Relationship Between Endophytes And Plants.....	3338
Heavy Metal Toxicity in Environmental Systems: Sources, Impacts and Remediation.....	3346
The Role Of Bryophytes In Medicinal Value	3352
Renewable Energy For Achieving Sustainable Development Goals.....	3357
भारतीय स्वतंत्रता संग्राम में महिला पत्रकारों की भूमिका	3363

Nanotechnology	3369
Non- Renewable Energy Resources: Advantages and Disadvantages	3374
Mathematical Approach on Transmission of Diabetes.	3379
Mechanism of Communicable Disease using Mathematical Model	3385
Role of Pigment Cells in the Formation of Color Patterns in Animals.....	3390
Food Preservation By Thermal Treatment.....	3395
Edible Packaging: A Sustainable Innovation.....	3399
Food Adulteration: A Persistent Threat To Public Health	3402
Molecular Signaling Pathways Regulating Pigment Cell Function	3407
Downstream Processing: Techniques, Applications, and Innovations in Biomanufacturing	3413
Fourier Transform Infrared Spectroscopy: Principles, Techniques, and Applications.....	3419
Mass Spectroscopy and Its Applications	3423
Bioactive Metabolites in Spring Onions: Nutritional Powerhouses and Their Health Benefit.....	3427
Novel Biosynthesis of Zinc Oxide nanoparticles from Hexa Coordinated Zinc (II) complex using nature's source, and it's in vitro Biological activities	3433
Anti –Microbial activity of Biosynthesized Copper (II) Complex derived from Green Chemistry approach	3438

Synergistic Antibacterial Activity of Green Synthesized Silver Nano materials.....	3444
Synthesis and Applications of Nanofilters.....	3449
Anemia and Hemopoietic Nutrients.....	3455
Amniocentesis: An Overview	3462
Review on Photochemical Reactions.....	3467
Review on Green Chemistry for the future.....	3471
Crop-weed competition.....	3477
Change in climate's impact on food and nutritional security	3483
The role of IOT in agriculture: revolutionizing farming practices	3488
Sustainable Agriculture: A Pathway to a Food-Secure Future	3493
Nominal Group Technique	3498
Remote monitoring and animal behavior by artificial intelligence.....	3503
Concept of Entrepreneur.....	3509
Use of artificial intelligence in livestock disease prediction	3514
Hearing Listening Process and Note Taking	3520
Use of artificial intelligence in livestock Farming.....	3526
Protocol for Quality Seed Production.....	3532
Marker Assisted Selection in Plant Breeding	3537
Organic Seed Production vs. Conventional Seed Production	3540

Agencies Involved in Seed Certification	3543
Trends in Biological Control of Horticultural Pests in India	3547
Principles and Applications of Nanotechnology in Pest Management.....	3552
Principle and Application of Remote Sensing in Crop Pest Management.....	3557
Non Insect Pests of Agriculture And Their Management	3562
Insect Pests of Groundnut And Their Management.....	3568
Insect Pests of Cotton And Their Management	3573
Digital Marketing Strategies and Their Effects on Modern Consumer Behavior	3577
Introduction to Human Resources ITM	3582
Future Trends in HR	3585
Strategies for Career Readiness: Balancing Hard and Soft Skills	3588
Future Trends in HR	3594
Networking Initiatives for Enhancing Tourism SMEs: A Case Study of Jammu and Kashmir	3597
Effective Marketing Strategies for E-Commerce Businesses in the Digital Age.....	3603
The Role of Sustainable Development in Addressing Global Challenges.....	3606
An Incorporated approach of green HRM on environmental factors into HR procedures to support sustainable growth inside businesses	3608

Content Marketing Strategies in the Digital Age.....	3610
Digital Consumer Behavior	3615
Social Media Analytics and Insights.....	3620
AI and Personalization in Modern Advertising	3624
Amalgamation of Companies	3629
Consumer attitudes towards social media advertisements	3633
Diversity, Equity, and Inclusion in Organizations	3638
TQM and HR	3642
Employee Well Being	3646
Customer Engagement in Social Media and Purchase Intentions in the Service Industry	3650
Increasing Role of Artificial Intelligence in purchase behavior.....	3656
Capital Assets Pricing Model.....	3662
The Gig Economy: HR Strategies for Freelance and Contract Worker	3667
Consumer Perceptions and Attitudes towards Eco- conscious Products in India	3672
The Marketing Mix: A Framework for Success	3678
Navigating the Moral Maze: Ethical Issues in Business Finance.....	3682
Effective Distribution Strategies for Reaching Rural Consumers.....	3687
Understanding Your Customer: Market Research and Segmentation.....	3692

Understanding the Capital Market	3696
Introduction to Secondary Market	3702
Introduction to Derivative Market	3708
Employee Well-being Programs: Their Impact on Retention and Productivity	3713
Diversity and Inclusion: Best Practices for Building an Inclusive Workplace	3717
The Role of HR Analytics in Strategic Decision Making	3721
Risk Management and Derivatives: Concepts and Applications	3724
Investment Analysis and Portfolio Management	3727
International Finance: Navigating Global Markets.....	3730
Direct Benefit Transfer (DBT): A Revolutionary Step towards Financial Inclusion and Transparency.....	3734
Optimizing Monetary Policy: The Reserve Bank of India's Response to Economic Challenges in 2019	3738
E-commerce Penetration: Challenges and Opportunities for Traditional Indian Businesses	3744
Application of ARDL Methodology in the Indian Stock Market.....	3750
The Impact of Cryptocurrency on the Indian Stock Market	3753
The Impact of Exchange Rate Fluctuations on the Indian Stock Market.....	3757
A Comprehensive Overview of Indian Accounting Standards (Ind AS).....	3762

Financial Inclusion and Digital Payments in India.....	3768
Strategic Disinvestment in India: An Analysis of 2019 Initiatives and Implications.....	3775
An Introduction to Floorball: Rules, Equipment, and Gameplay	3781
Developing Leadership Skills on the Court: Becoming a Team Captain	3785
Artificial Turf vs. Natural Turf: A Comprehensive Comparison.....	3789
Beyond the Buzzer: Coping with Anxiety in Basketball	3795
Class Organisation Strategies in Physical Education For Differently Able Children	3799
Comparative Effects of Interval Training Methods and Repetition Training Method on the Performance of 800-Meter Runners.....	3802
Effects of Interval Training Methods for 400-Meter Runners	3809
Event Management in Sports	3816
Yoga & Fitness Programme for Women and Elderly People	3818
Inclusive Technology for Special Education	3823
Leadership in Sports: Key Traits, Styles, and Impact on Teams	3829
Navigating Challenges to Women's Self-Respect.....	3835
Risks and Benefits of Martial Arts.....	3839

Syncing Body and Mind: Aerobics for Stress Resilience	3843
Taekwondo Essay Examples.....	3847
Test Measurements Evaluation Profile of Soccer Game of Special Students	3850
The Evolution of Floorball: From Its Origins to Modern Day	3852
Uefa Euro	3857
Uefa Nations Cup.....	3859
Understanding the Theory of Power in Taekwondo	3861
Analytical Method Development And Validation By Rp- Hplc For Determination Of Gliclazide In Bulk Dosage Form Economically.....	3864
Gamification in HR: Leveling Up Employee Engagement	3867
The Culture Architect: HR's Role in Shaping Organizational DNA	3872
Cross-Border Fintech Regulation	3877
Custom Duty	3881
Cybersecurity and Regulatory Frameworks.....	3884
Dividend Policy	3888
Effective Portfolio Management.....	3892
Fintech and Regulatory Innovation.....	3896
Leveraging Machine Learning for Market Segmentation	3900

Eco-Therapy: The Role of Nature in Reducing Workplace Stress	3905
The Trust Factor: Building Bridges in the Workplace..	3910

Editors: Prof. Pallavi Khatri and Mr. Abhishek Tripathi



alfa Publications

4398/5, Ansari Road, Daryaganj, New Delhi-110 002

Phone: 011-23275092

email: alfapublications@yahoo.co.in

alfapublications@gmail.com

ISBN 978-93-85512-66-7

