+91 - 181- 270 8844 Telephone
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1.3.2 ***Number of certificate / value-added courses / Diploma Programme/ online courses of MOOCS / SWAYAM / e_Pathshala/ NPTEL etc. where the students of the institution have enrolled and successfully completed***

Brochures (Year 2018-19)

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF AGRICULTURE

VALUE ADDED COURSE

Sustainable Farming Practices and Technology Integration

SESSION : 2018-19

Duration From
July, 2018 to December 2018

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- **To introduce students to sustainable agricultural practices that promote environmental stewardship, economic profitability, and social responsibility.**
- **To equip students with knowledge of modern agricultural technologies such as the Internet of Things (IoT) and drones, and their integration into sustainable farming.**

Syllabus Overview

Module 1: Principles of Sustainable Agriculture

- Overview of sustainable farming techniques such as crop rotation, no-till farming, and cover cropping.
- The role of organic farming in enhancing soil fertility and reducing chemical inputs.

Module 2: Integration of Technology in Agriculture

- The application of IoT and sensors in precision farming to monitor crop health, soil conditions, and irrigation needs.
- Using drones for crop monitoring, yield estimation, and precision spraying.
- **Hands-On Lab:** Setting up IoT devices for a precision farming project.

Module 3: Soil and Water Conservation Techniques

- Techniques for conserving soil and water resources, including terracing, contour plowing, and drip irrigation.
- **Case Studies:** Successful sustainable farming practices from around the world.

Module 4: Final Project

- Students will design a sustainable farming plan for a local farm, integrating IoT technology and organic farming methods.

Resources

- *Sustainable Agriculture* by John Mason
- *Precision Agriculture Technology for Crop Farming* by Qin Zhang

Assessment Methodology

- **Quiz – MCQs to assess understanding of concepts**
- **Case based assignments**

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF BIOTECHNOLOGY

VALUE ADDED COURSE

Industrial Biotechnology: Bioprocessing, Bio-Manufacturing, and Product Development

SESSION : 2018-19

Duration From
January, 2019-March, 2019

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course description:

By the end of this course, students will be able to:

1. Understand the fundamentals of bioprocessing and bio-manufacturing techniques in industrial biotechnology.
2. Design and operate bioprocesses for the production of bio-based products such as enzymes, biofuels, and biopharmaceuticals.
3. Apply knowledge of downstream processing techniques such as purification, filtration, and chromatography for product recovery.
4. Comprehend regulatory frameworks and quality control measures required in biomanufacturing.

Syllabus Overview:

Module 1: Introduction to Industrial Biotechnology

- *The role of biotechnology in industries such as pharmaceuticals, agriculture, biofuels, and bio-manufacturing.*
- Key steps in designing industrial bioprocesses, including upstream and downstream processing.

Module 2: Fermentation Technology and Bioreactor Operations

- Batch, fed-batch, and continuous fermentation techniques, with examples from the pharmaceutical and food industries.
- Principles of bioreactor design and scale-up processes for industrial production.

Module 3: Downstream Processing and Product Recovery

- Filtration, centrifugation, membrane separation, and chromatography for the purification and recovery of bio-products.
- Case studies in the recovery of biopharmaceuticals, enzymes, and biofuels.

Module 4: Bio-Manufacturing and Bio-Based Product Development

- The industrial production of biopharmaceuticals such as monoclonal antibodies, insulin, and vaccines.
- The development of bio-based products like biofuels, bioplastics, and nutraceuticals for industrial applications.

Assessment Methodology

- Oral/poster presentation
- Research based Assignment related to course

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF CHEMISTRY

VALUE ADDED COURSE

Chemistry: Advanced Analytical Techniques for Industry and Research

Duration From: August, 2018 to December, 2018

SESSION : 2018-19

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course description:

By the end of this course, students will be able to:

1. Understand the principles and applications of advanced analytical techniques.
2. Operate and troubleshoot modern analytical instruments.
3. Analyze chemical data and interpret results accurately.
4. Apply analytical techniques to solve complex problems in research and industry.

Syllabus Overview:

Module 1: Introduction to Analytical Techniques

- Introduction to the evolution of analytical techniques, transitioning from classical chemical analysis to modern instrumental methods.
- Introduction to UV-Vis, IR, and NMR spectroscopy.
- Students will be introduced to UV-Vis and IR spectroscopy.

Module 2: Chromatographic Methods

- Principles of gas-liquid chromatography, retention mechanisms, column selection, and detectors (e.g., FID, TCD).
- Students will perform HPLC and GC-MS experiments.

Module 3: Electrochemical Methods

- Introduction to potentiometry, voltammetry, and coulometry.
- Using electrochemical techniques for detecting and monitoring pollutants.
- Students will apply electrochemical methods to environmental samples.

Module 4: Data Analysis and Interpretation

- Introduction to analytical data acquisition systems and software used for processing experimental data (e.g., chromatographic and spectroscopic data).
- Basics of statistical tools for interpreting results, including error analysis, linear regression, and calibration methods.
- Students will work with real-world datasets from experiments and learn to process and interpret the data using analytical software (e.g., Origin, MATLAB).

Assessment Methodology

- Quiz – MCQs to assess understanding of concepts
- Case based assignments

DAV UNIVERSITY

JALANDHAR

DEPARTMENT OF MICROBIOLOGY

VALUE ADDED COURSE

Microbial Biotechnology for Sustainable Agriculture

Duration From:
August, 2018 to December, 2018

SESSION : 2018-19

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course description:

1. Students will grasp how microorganisms function in the ecosystem and their significance in maintaining soil health.
2. Students will learn how to use microbial solutions for plant nutrition and protection from pests in a sustainable manner.
3. Students will explore microbial methods to clean contaminated environments, particularly in agricultural settings.
4. Students will learn how microbial biotechnology can help crops withstand environmental stresses and improve yields.

Syllabus overview

Module 1: Agricultural Microbiology Fundamentals

- Overview of soil microbiology and microbial interactions.
- The role of microorganisms in nutrient cycling (e.g., nitrogen, phosphorus).
- Importance of microbial biodiversity in sustainable agriculture.

Module 2: Biofertilizers and Biopesticides

- Types of biofertilizers (nitrogen-fixing bacteria, phosphate-solubilizing microorganisms).
- Biopesticides: Microbial alternatives to chemical pesticides (Bacillus thuringiensis, fungal pathogens).
- Application of biofertilizers and biopesticides in agriculture.

Module 3: Microbial Bioremediation in Agriculture

- Use of microorganisms for bioremediation of pesticide residues and heavy metals.
- Soil and water remediation using microbes.
- Case studies on successful bioremediation applications in agriculture.

Module 4: Microbial Biotechnology for Stress Tolerance

- Microbial inoculants for enhancing plant resistance to stress (drought, salinity).
- Symbiotic microbes and their role in stress adaptation.
- Case studies on microbial solutions improving crop resilience.

Assessment Methodology

- Short answer based subjective test to assess understanding of concepts
- Research based Assignment related to course

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF CHEMICAL ENGINEERING

VALUE ADDED COURSE

AI and Data Science in Chemical Process Optimization

SESSION : 2018-19

Duration From:
January, 2019 to April, 2019

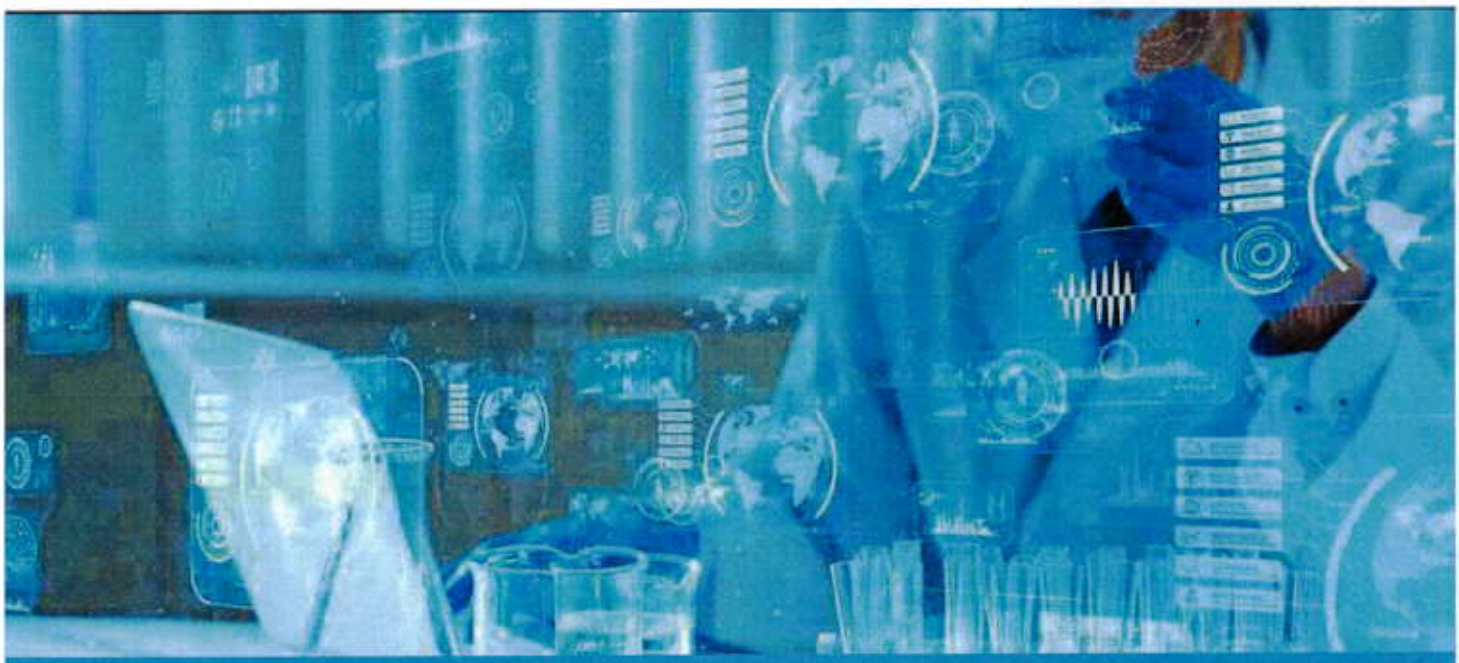
HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab



Course Objectives

- To provide practical skills in applying AI and data science to optimize chemical processes.
- To familiarize students with machine learning models for predictive maintenance and process control.

Syllabus Overview

Module 1: Introduction to Data Science for Chemical Engineering

- Data analytics basics for chemical processes
- Python and R programming for data analysis

Module 2: Machine Learning Models for Process Optimization

- Regression, clustering, and classification techniques
- Case study: Optimizing a distillation column using machine learning

Module 3: Predictive Maintenance in Chemical Plants

- Monitoring and maintaining equipment health with AI
- Practical lab: Building predictive models using real-world data

Module 4: Industry Applications

- AI applications in pharmaceutical, petrochemical, and materials industries
- Hands-on project: AI-based optimization of a chemical reactor

Assessment Methodology

- Quiz – MCQs to assess understanding of concepts
- Research based Assignment related to course

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF CIVIL ENGINEERING

VALUE ADDED COURSE

Total Station and Surveying Techniques

SESSION : 2018-19

Duration From:
January, 2019 to April, 2019

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- To provide comprehensive practical knowledge of modern surveying techniques using Total Station equipment.
- To train students in the application of these techniques for construction, land management, and infrastructure development projects.
- To develop skills in data collection, processing, and integration with Geographic Information Systems (GIS) for enhanced decision-making.
- To familiarize students with real-world applications of surveying techniques in construction, topographic mapping, and land management.

Syllabus Overview

MODULE 1: SURVEYING BASICS

- **Introduction to Land Surveying Techniques:** Overview of traditional and modern land surveying methods, focusing on the evolution from manual to automated tools like the Total Station. Understanding the importance of precision in construction, land development, and infrastructure projects.
- **Total Station Overview:** Detailed study of Total Station equipment, including components, setup, and calibration. Instruction on safe handling and care of the equipment to ensure accurate and reliable performance during fieldwork.
- **Equipment Handling and Setup:** Step-by-step guidance on setting up the Total Station on site. This includes tripod leveling, equipment alignment, and preparation for capturing survey data. Practical demonstrations will be provided to ensure hands-on familiarity with the instrument.

MODULE 2: ADVANCED TOTAL STATION TECHNIQUES

- **Distance Measurement:** Introduction to the principles of Electronic Distance Measurement (EDM) using the Total Station. Explanation of how the instrument calculates distances using electromagnetic waves, with a focus on minimizing errors in measurement.
- **Angle Measurement:** Detailed study of horizontal and vertical angle measurements. This includes the proper techniques for sighting, setting reference points, and ensuring accurate angle calculations for site layouts.
- **Height Measurement and Elevations:** Instruction on measuring height differences and calculating elevation using Total Station. Students will learn how to establish benchmarks and determine elevations across uneven terrain.
- **Practical Exercises:** Field exercises that involve conducting a survey of a simulated or real construction site. Students will practice taking measurements for laying out the foundation of a building, road alignment, and other construction activities. Data collection and accuracy will be emphasized.

MODULE 3: DATA MANAGEMENT AND GIS INTEGRATION

- **Survey Data Storage and Processing:** Introduction to digital storage of survey data. Students will learn how to export data from the Total Station to computers and process it using specialized software for further analysis. The focus will be on data validation, error checking, and preparing data for integration into larger projects.
- **Introduction to GIS and Survey Data Integration:** Overview of Geographic Information Systems (GIS) and their importance in modern land surveying and construction management. Students will learn how to integrate Total Station data into GIS software to create accurate maps and models.
- **Hands-on Lab:** Practical lab session where students will process survey data and integrate it into a GIS platform for spatial analysis. The lab will involve mapping the surveyed site, generating contour maps, and performing other analysis essential for construction planning and land management.

MODULE 4: CASE STUDIES AND REAL-WORLD APPLICATIONS

- **Case Studies in Infrastructure and Land Management:** Exploration of real-world applications of Total Station surveying in major construction and infrastructure projects. Case studies will cover topics such as road construction, building layout, topographic mapping, and urban planning.
- **Challenges in Land Surveying:** Discussion of the common challenges faced in surveying, including dealing with difficult terrain, environmental factors, and limitations of the equipment. Strategies for overcoming these challenges will be shared.

Assessment Methodology

- Oral/poster presentation
- Research based Assignment related to course

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF
Electronics and Communication Engineering

VALUE ADDED COURSE

IoT-based System Design

Duration From: January, 2019 to April, 2019

SESSION : 2018-19

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- To introduce students to the concepts of IoT and its applications in electronics and communication.
- Equip students with the knowledge to design IoT systems using various sensors and microcontrollers.

Syllabus Overview

Module 1: Introduction to IoT

- IoT architecture and protocols
- IoT use cases in smart cities and healthcare
- Introduction to sensors and actuators in IoT

Module 2: Communication Protocols

- MQTT, CoAP, HTTP, and LoRaWAN protocols
- Hands-on lab: Establishing communication between IoT devices

Module 3: Embedded Systems for IoT

- Programming microcontrollers (Arduino, Raspberry Pi) for IoT applications
- Interfacing sensors and communication modules

Module 4: IoT Project Implementation

- Final project: Develop a complete IoT-based smart home solution

Assessment Methodology

- Short answer based subjective test to assess understanding of concepts
- Research based Assignment related to course

DAV UNIVERSITY

JALANDHAR

DEPARTMENT OF MATHEMATICS

VALUE ADDED COURSE

Advanced Mathematical Tools for Data Science

Duration From: August, 2018 to November, 2018

SESSION : **2018-19**

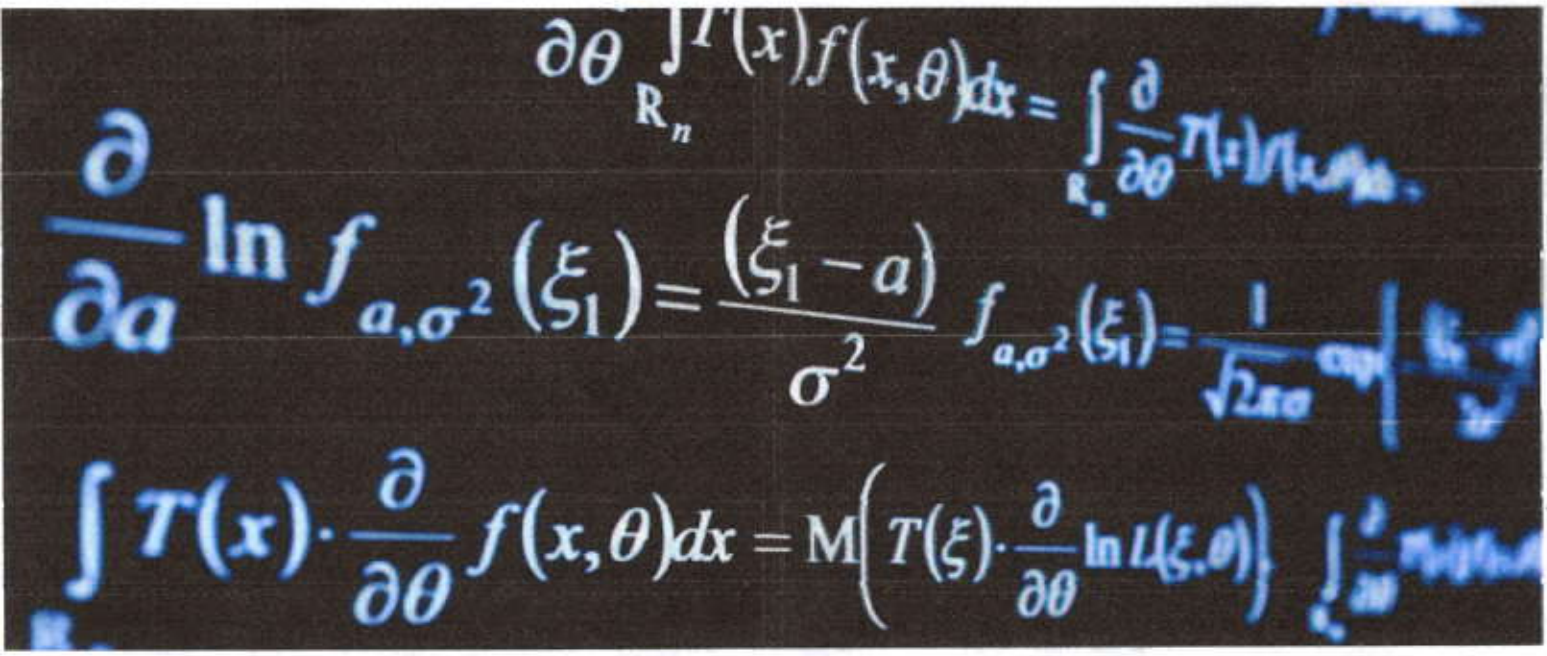
HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway **(NH 44), JALANDHAR- 144 012, Punjab**



Course description:

1. Students will understand how linear algebra forms the backbone of machine learning algorithms, enabling techniques such as dimensionality reduction.
2. Students will be able to apply statistical methods to analyze and interpret data, creating probabilistic models.
3. Students will learn how calculus plays a crucial role in the training of machine learning models by optimizing objective functions.
4. Students will gain hands-on experience in using numerical methods to solve real-world data science problems.

Syllabus overview:

Module 1: Linear Algebra for Data Science

- **Topics**: Vectors, matrices, eigenvalues, eigenvectors, matrix operations.
- **Applications**: Dimensionality reduction (PCA), matrix factorization.
- **Tools**: Python libraries for matrix computation.

Module 2: Probability and Statistics

- **Topics**: Probability distributions, random variables, sampling, hypothesis testing.
- **Applications**: Building probabilistic models, decision-making under uncertainty.
- **Tools**: Python libraries for probability and statistical analysis.

Module 3: Calculus and Optimization

- **Topics**: Derivatives, gradients, multivariable calculus, optimization techniques (gradient descent).
- **Applications**: Optimization in neural networks and machine learning algorithms.
- **Tools**: Implementation of optimization algorithms in Python.

Module 4: Numerical Methods and Computation

- **Topics**: Numerical integration, interpolation, solving differential equations.
- **Applications**: Predictive modeling and simulations.
- **Tools**: MATLAB or Python for numerical problem-solving.

Assessment Methodology

- Quiz – MCQs to assess understanding of concepts
- Case based assignments

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF ELECTRICAL ENGINEERING

VALUE ADDED COURSE

ADVANCED POWER SYSTEMS AND SMART GRIDS

SESSION : 2018-19

Duration From:
August, 2018 to November, 2018

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553
TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- Provide in-depth knowledge of modern power systems, smart grids, and renewable energy integration.
- Train students in the use of software tools for grid management and analysis.
- Explore smart grid communication technologies and their role in grid stability.

Syllabus Overview

Module 1: Fundamentals of Power Systems

- Power generation, transmission, and distribution
- Grid components and load flow analysis
- Introduction to renewable energy sources in grids

Module 2: Smart Grids and IoT

- Smart grid communication technologies (IoT, AMI, SCADA)
- Integration of renewable energy and demand-side management
- Case studies on smart grid implementations

Module 3: Energy Storage and Grid Stability

- Role of batteries, flywheels, and other storage systems
- Techniques for maintaining grid stability and reliability
- Simulation exercises using PSIM software

Module 4: Real-World Applications

- Smart grid case studies
- Hands-on project: Designing a smart grid for a small town

Assessment Methodology

- Quiz – MCQs to assess understanding of concepts
- Research based Assignment related to course

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF MECHANICAL ENGINEERING

VALUE ADDED COURSE

Advanced Manufacturing Techniques and Industry 4.0 Integration

Duration From: January, 2019 to April, 2019

SESSION : 2018-19

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- To introduce students to advanced manufacturing techniques, such as additive manufacturing (3D printing), CNC machining, and robotics, and how these technologies are applied in the mechanical engineering field.
- To provide students with knowledge of Industry 4.0 technologies, including IoT, smart manufacturing, cyber-physical systems (CPS), and digital twins.
- To equip students with the skills to integrate advanced manufacturing technologies with real-time data and automation systems to create efficient and sustainable production processes.
- To develop problem-solving abilities related to mechanical design and manufacturing optimization using digital technologies.

Syllabus Overview

MODULE 1:
Advanced Manufacturing Techniques

- Overview of traditional vs. advanced manufacturing.
- **Additive Manufacturing (3D Printing):** Understanding FDM, SLA, SLS techniques and their applications in industry.
- **CNC Machining:** Basics of CNC machining, G-code programming, and the role of automation in modern production.
- **Case studies:** Applications of 3D printing and CNC machining in the automotive and aerospace industries.

MODULE 2:
Industry 4.0 and Digital Manufacturing

- **Introduction to Industry 4.0:** The fourth industrial revolution and its impact on mechanical engineering.
- **IoT and Smart Sensors:** Application of IoT in monitoring machine performance and real-time decision-making.
- **Cyber-Physical Systems (CPS) and Digital Twins:** Using CPS and digital twins to simulate, monitor, and optimize mechanical processes.
- **Hands-On Lab:** Simulation of a digital twin for a mechanical process and application of IoT sensors in a workshop environment.

MODULE 3:
Robotics and Automation in Manufacturing

- **Introduction to robotics in manufacturing:** Types of industrial robots and their programming.
- **Collaborative Robots (Cobots):** Role of cobots in enhancing productivity and safety in manufacturing.
- **Robotic Process Automation (RPA):** Automating mechanical processes with minimal human intervention.
- **Hands-On Lab:** Programming a robotic arm to perform a mechanical assembly task.

MODULE 4:
Data Analytics and Predictive Maintenance

- **Big Data in Manufacturing:** Using big data for process optimization, predictive maintenance, and decision-making.
- **Predictive Analytics:** Techniques for predicting machine failures and improving production efficiency using data from IoT sensors.
- **Hands-On Lab:** Application of predictive maintenance algorithms using a simulated production line.

MODULE 5:
Sustainable Manufacturing Practices

- **Lean Manufacturing:** Principles of lean manufacturing and their application in reducing waste and improving efficiency.
- **Sustainability in Manufacturing:** Energy-efficient machines, waste management, and green technologies in modern production systems.
- **Case studies:** Implementation of sustainable manufacturing practices in industries like automotive and electronics.

Assessment Methodology

- Quiz →MCQs to assess understanding of concepts
- Case based assignments

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF PHYSICS

VALUE ADDED COURSE

Applications of Quantum Mechanics in Modern Technology

SESSION : 2018-19

Duration From
July, 2018 to November, 2018

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course description:

By the end of this course, students will be able to:

1. Demonstrate a solid understanding of fundamental quantum mechanics concepts such as wave-particle duality, superposition, and quantum tunneling.
2. Apply quantum mechanical principles to analyze and understand the operation of modern technologies like quantum computers and cryptographic systems.
3. Design and simulate basic quantum systems using appropriate quantum models and tools.
4. Explore and engage in research on quantum technologies such as quantum dots and nanoelectronics.
5. Complete a hands-on project involving the simulation of a quantum mechanical system.

Syllabus Overview:

Module 1: Fundamentals of Quantum Mechanics

- Overview of one of the most fundamental concepts of quantum mechanics.
- Study of the Schrödinger equation, the cornerstone of non-relativistic quantum mechanics, which describes how the quantum state of a system evolves over time.
- Detailed exploration of key quantum phenomena such as superposition entanglement and quantum tunneling, quantum oscillators, particle spin, and angular momentum.

Module 2: Quantum Technologies

- Introduction to the basic principles of quantum computing
- Examination of how quantum mechanics is revolutionizing cryptography.
- In this lab session, students will use quantum computing simulators to explore the operation of basic quantum gates and algorithms.

Module 3: Quantum Dots and Nanoelectronics

- Quantum dots are nanoscale semiconductor particles that have quantum mechanical properties, such as quantized energy levels.
- Students will learn about the practical uses of quantum dots in fields such as optoelectronics, solar energy, medical imaging, and displays.
- In this section, students will examine real-world case studies where nanoelectronic devices, powered by quantum dots and other quantum mechanical systems

Module 4: Research and Applications

- This module will guide students through the various research frontiers in quantum mechanics and its applications in modern technology.

For the final project, students will design and simulate a simple quantum mechanical system.

Assessment Methodology

- **Short answer based subjective test to assess understanding of concepts**
- **Research based Assignment related to course**

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF ZOOLOGY

VALUE ADDED COURSE

Applied Zoology: Industrial Applications in Environmental Management

Duration From: July, 2018 to October, 2018

SESSION : 2018-19

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Description:

This course explores the industrial applications of zoological sciences in areas such as environmental management, biotechnology, and wildlife conservation. Students will gain insights into how zoological knowledge can be applied to industries like pest control, bioresource management, environmental impact assessments, and biodiversity conservation. Hands-on experience with bio-monitoring, environmental assessments, and wildlife management practices will be emphasized.

By the end of this course, students will be able to:

1. Understand the role of zoology in industrial applications.
2. Apply zoological methods to address environmental challenges..
3. Conduct environmental impact assessments and develop sustainable wildlife management strategies.
4. Work for environmental conservation, wildlife management, and bioresource utilization.

Syllabus Overview:

Module 1: Zoology in Environmental Management and Sustainability

- Role of zoological knowledge in managing ecosystems, protecting biodiversity, and sustaining wildlife.
- Exploring industries that use zoological knowledge, including pest control, environmental consultancy, and wildlife conservation organizations, perform a basic environmental impact assessment (EIA) for a local ecosystem.

Module 2: Pest Control and Bio-Resource Management

- Study of insect behavior, biological control agents, and modern techniques used for pest control in agriculture, urban settings, and industries.
- Design a pest control program using biological agents and study the economic and ecological impacts.

Module 3: Biotechnology and Zoological Research in Industry

- Application of zoological research in biotechnology, including the use of animal models, genetic engineering, and bioresource exploitation.
- Exploring how animal products and behaviors contribute to the pharmaceutical industry, including venom research, animal hormones, and drug testing on animal models.

Module 4: Conservation Biology and Wildlife Management

- Conservation biology principles applied to the protection and sustainable management of wildlife species, focusing on endangered species.
- Exploring how industries such as ecotourism, wildlife parks, and zoos contribute to conservation efforts and the economy.

Module 5: Environmental Impact Assessments and Bio-Monitoring

- Understanding the processes involved in conducting EIAs and their importance in industrial projects like construction, mining, and energy production.
- Techniques for monitoring species health and populations in response to environmental changes and industrial impacts (e.g., pollution, deforestation).

Assessment Methodology

- **Quiz – MCQs to assess understanding of concepts**
- **Case based assignments**

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF ENGLISH

VALUE ADDED COURSE

Creative Writing and Digital Storytelling

SESSION : 2018-19

Duration Form
July, 2018 to November, 2018

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- To enhance students' creative writing skills for various digital platforms, including blogs, podcasts, and social media.
- To explore narrative and storytelling techniques specific to digital media, focusing on audience engagement, visual integration, and multimedia storytelling.
- To develop an understanding of visual storytelling and its application in creating compelling narratives for digital platforms.
- To equip students with the ability to create, curate, and publish digital content that effectively integrates text, visuals, and other media formats.

Syllabus Overview

MODULE 1: INTRODUCTION TO CREATIVE WRITING

Principles of Creative Writing: Introduction to the foundational principles of creative writing, including structure, tone, style, and voice. Students will learn how to construct well-organized stories and develop a distinctive writing style across different genres. Focus will be on understanding how creativity can be expressed within the constraints of narrative forms.

Techniques for Writing Fiction, Poetry, and Creative Non-Fiction: Detailed study of techniques used in writing fiction, poetry, and creative non-fiction. Students will explore storytelling elements such as character development, dialogue, setting, and plot creation for fiction; rhythm, metaphor, and imagery for poetry; and personal voice, reflection, and truth-telling for non-fiction.

Exploring Genres and Developing a Unique Writing Style: Students will experiment with various literary genres, including fantasy, memoir, romance, thriller, and satire. The goal will be to help students discover their unique voice and writing style, adapting their craft to different narrative forms.

MODULE 2: DIGITAL STORYTELLING

Narrative Techniques for Blogs, Vlogs, and Podcasts: Introduction to digital storytelling, focusing on how narrative techniques are adapted for blogs, video logs (vlogs), and podcasts. Students will learn how to structure content for digital platforms, maintain audience engagement, and craft stories that are well-suited for short-form and episodic formats.

Writing for Social Media and Digital Platforms: Exploration of writing techniques specifically tailored for social media content (e.g., Twitter, Instagram, Facebook). This includes understanding the importance of brevity, visual complementarity, hashtags, and interactivity in social media storytelling. Students will also explore strategies for creating viral content that resonates with digital audiences.

Case Studies of Successful Digital Storytelling Platforms: In-depth analysis of successful digital storytelling platforms, including popular blogs, YouTube channels, and podcast series. Students will critically assess what makes these platforms effective and explore how storytelling can be optimized for different digital media.

MODULE 3: VISUAL STORYTELLING AND MULTIMEDIA CONTENT

Introduction to Visual and Interactive Storytelling: Examination of how visual elements such as photography, video, and infographics enhance storytelling on digital platforms. Students will explore the role of interactivity in creating engaging and immersive content, learning how to use visual cues to support and extend the narrative.

Creating Compelling Visuals for Written Content: Practical guidance on integrating compelling visuals into written content, including how to design thumbnails, select impactful imagery, and create video teasers for blogs and podcasts. Students will explore basic visual design principles such as composition, color theory, and typography.

Hands-On Project: Developing a Digital Story Using Text and Multimedia: A practical project where students will create a digital story that integrates text with multimedia elements (images, audio, and video). Students will be guided through the process of selecting appropriate media to complement their written content, enhancing the story's emotional and visual appeal.

MODULE 4: ETHICS IN DIGITAL WRITING

Copyright, Plagiarism, and Intellectual Property Rights: Examination of the legal frameworks that govern content creation in the digital age. Students will learn about copyright laws, how to avoid plagiarism, and how to properly credit and use external media such as images, music, and videos. Special focus will be placed on Creative Commons licensing and free-use policies.

Ethical Challenges in Content Creation and Storytelling: Discussion of ethical considerations when creating digital content, including sensitivity to cultural issues, accuracy in non-fiction storytelling, and respecting the privacy of individuals when writing personal or biographical pieces. Students will also learn about the ethical responsibilities of content creators in maintaining authenticity and avoiding manipulation.

Final Project: Writing a Blog Series or Podcast Script: For the final project, students will write and publish either a blog series or a podcast script, demonstrating mastery of both creative writing and digital storytelling techniques. The project will involve developing a storyline, creating engaging episodes, and integrating multimedia elements. The blog series or podcast will be published on a live platform, and students will be required to promote their work using social media strategies learned in the course.

Assessment Methodology

- Oral/poster presentation
- Research based Assignment related to course

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF COMMERCE, BUSINESS MANAGEMENT & ECONOMICS

VALUE ADDED COURSE

Digital Marketing and E-Commerce Strategies

SESSION : 2018-19

Duration Form
July, 2018 to November, 2018

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course description:

By the end of this course, students will be able to:

1. Develop and implement comprehensive digital marketing strategies for businesses, utilizing SEO, social media, and content marketing techniques.
2. Set up and manage e-commerce platforms, integrating secure payment gateways, shipping solutions, and customer service tools.
3. Use data analytics tools like Google Analytics to track, analyze, and optimize the performance of digital marketing campaigns.
4. Address legal and ethical issues in e-commerce, including compliance with GDPR and other consumer protection laws.
5. Execute a full digital marketing campaign, from initial planning and strategy development to campaign launch and performance evaluation.

Syllabus Overview:

Module 1: Introduction to Digital Marketing

- Introduction to the fundamentals of SEO and how it impacts website traffic and rankings on search engines like Google.
- Exploration of how social media platforms (e.g., Facebook, Instagram, Twitter, LinkedIn) can be used for brand building and customer engagement.

Module 2: E-Commerce Platforms

- Step-by-step guidance on setting up an e-commerce store using platforms like Shopify and WooCommerce.
- Introduction to payment gateways such as PayPal, Stripe, and Square.
- Exploration of various shipping solutions and how to integrate them into e-commerce stores.

Module 3: Data Analytics in Digital Marketing

- Introduction to Google Analytics and its role in tracking and evaluating the performance of digital marketing campaigns.
- Exploration of how data analytics can be used to create targeted marketing campaigns.
- In-depth analysis of successful e-commerce businesses such as Amazon, Shopify, and Etsy.

Module 4: Legal and Ethical Issues in E-Commerce

- Examination of the GDPR and its impact on e-commerce businesses.
- Exploration of the ethical challenges in digital marketing.

Introduction to cybersecurity threats faced by e-commerce businesses.

Assessment Methodology

- Quiz – MCQs to assess understanding of concepts
- Case based assignments

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF PSYCHOLOGY

VALUE ADDED COURSE

Behavioral Economics and Decision Making in Organizations

SESSION : 2018-19

Duration Form
January, 2019 to May, 2019

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

This course provides students with comprehensive knowledge of modern analytical techniques used in both industry and research settings. The course focuses on spectroscopy, chromatography, and electrochemical methods, emphasizing hands-on experience with advanced instruments like HPLC, GC-MS, and NMR. Students will also learn how to interpret complex data from experiments, preparing them for roles in research labs and chemical industries.

Course Objectives

- To provide an understanding of behavioral economics principles and their influence on decision-making processes in organizations.
- To explore the psychological biases that affect individual and organizational economic decisions.
- To equip students with practical tools for applying behavioral economics to enhance decision-making, problem-solving, and resource management in organizations.
- To develop strategies for mitigating decision-making biases and improving the overall effectiveness of organizational policies and strategies.

Learning Outcomes

By the end of this course, students will be able to:

- Understand the principles and applications of advanced analytical techniques.
- Operate and troubleshoot modern analytical instruments.
- Analyze chemical data and interpret results accurately.
- Apply analytical techniques to solve complex problems in research and industry.

Syllabus Overview

Module 1: Introduction to Analytical Techniques

- **Overview of Classical vs. Modern Analytical Methods:** Introduction to the evolution of analytical techniques, transitioning from classical chemical analysis to modern instrumental methods.
- **Fundamentals of Spectroscopy:** Introduction to UV-Vis, IR, and NMR spectroscopy, focusing on the principles of light-matter interaction and its application in chemical analysis.
- Hands-On Lab: Students will be introduced to UV-Vis and IR spectroscopy, learning how to measure absorption spectra and analyze organic and inorganic compounds.

Module 2: Chromatographic Methods

- **Gas Chromatography (GC) and High-Performance Liquid Chromatography (HPLC):** Principles of gas-liquid chromatography, retention mechanisms, column selection, and detectors (e.g., FID, TCD). Focus on the importance of separation techniques in industry and research, including pharmaceuticals, food analysis, and environmental monitoring.
- **Hands-On Lab:** Students will perform HPLC and GC-MS experiments to analyze complex mixtures such as pharmaceuticals, pollutants, and biochemical compounds.

Module 3: Electrochemical Methods

- **Basics of Electrochemical Analysis:** Introduction to potentiometry, voltammetry, and coulometry, focusing on the detection of ions, redox reactions, and electrochemical sensors.
- **Applications in Environmental and Industrial Analysis:** Using electrochemical techniques for detecting pollutants, monitoring industrial processes, and measuring trace metals in environmental samples.
- **Hands-On Lab:** Students will apply electrochemical methods to environmental samples (e.g., water samples) to detect trace ions and pollutants.

Module 4: Data Analysis and Interpretation

- **Data Acquisition and Processing:** Introduction to analytical data acquisition systems and software used for processing experimental data (e.g., chromatographic and spectroscopic data).
- **Statistical Analysis:** Basics of statistical tools for interpreting results, including error analysis, linear regression, and calibration methods.
- **Hands-On Lab:** Students will work with real-world datasets from experiments and learn to process and interpret the data using analytical software (e.g., Origin, MATLAB).

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF JOURNALISM AND MASS COMMUNICATION

VALUE ADDED COURSE

Digital Journalism and Content Creation

Duration Form
August, 2018 to November, 2019

SESSION : 2018-19

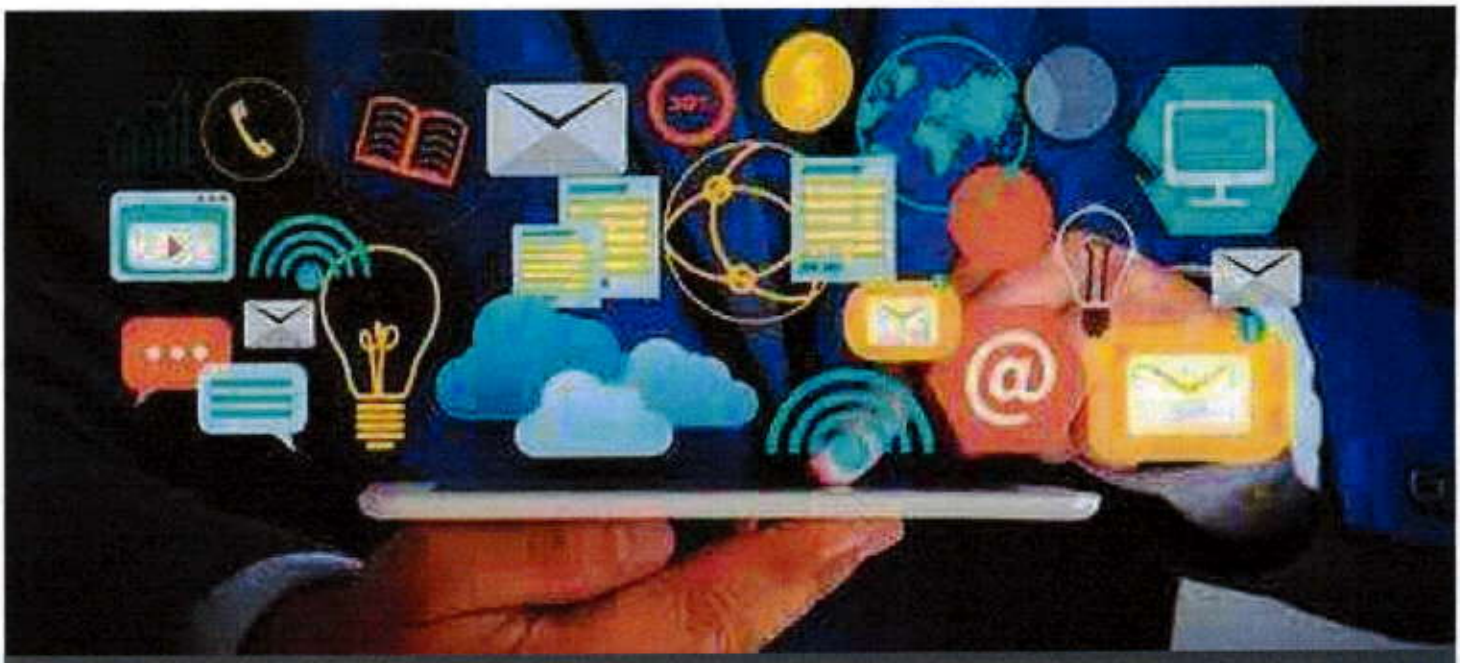
HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab



Course Objectives

- To provide students with practical skills for creating content on digital media platforms.
- To teach students multimedia storytelling techniques that are applicable to online journalism.

Syllabus Overview

Module 1: Introduction to Digital Journalism

- Fundamentals of journalism in the digital age, including the shift from traditional to online news.
- ***Writing for digital platforms:*** Blogs, news websites, and social media.

Module 2: Multimedia Content Creation

- Basics of video production, video editing, and storyboarding for news reporting.
- ***Hands-On Lab:*** Producing a short news video.
- Audio storytelling techniques for podcasts and digital news broadcasts.

Module 3: Social Media Strategies for Journalists

- Creating engaging and shareable content for platforms like Twitter, Instagram, and YouTube.
- ***Case Studies:*** Successful digital journalism initiatives such as The Skimm, Vice, and The Verge.

Module 4: Ethics in Digital Journalism

- Tackling fake news and managing misinformation in the digital era.
- Ethical considerations in digital content creation, including privacy and bias.
- ***Final Project:*** Developing a digital media content series.

Resources

- *Digital Journalism: Principles and Practices* by Janet Jones
- *The Elements of Journalism* by Bill Kovach and Tom Rosenstiel

Assessment Methodology

- Oral/poster presentation
- Research based Assignment related to course

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VALUE ADDED COURSE

Blockchain for Cybersecurity in Computer Networks

SESSION : 2018-19

Duration From
January, 2019 to April, 2019

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- To introduce the core concepts and fundamentals of blockchain technology and its potential to enhance cybersecurity in computer networks.
- To provide students with hands-on experience in designing and developing blockchain-based solutions aimed at improving the security and resilience of decentralized networks.
- To explore the cryptographic principles behind blockchain and how these can be leveraged to secure digital assets and communications in a network environment.
- To equip students with the knowledge and skills needed to build and implement secure, blockchain-enabled network infrastructures for authentication, data integrity, and confidentiality.

Syllabus Overview

MODULE 1: INTRODUCTION TO BLOCKCHAIN TECHNOLOGY

Overview of Blockchain Technology: Introduction to the origins and evolution of blockchain technology, including its key features such as decentralization, immutability, and transparency. Students will learn about the differences between public, private, and consortium blockchains, and the various use cases across industries.

Cryptographic Foundations of Blockchain: Detailed exploration of the cryptographic mechanisms that form the foundation of blockchain technology, including hash functions, public-key cryptography, and digital signatures. The focus will be on how these cryptographic tools ensure data security, integrity, and privacy in blockchain systems.

Consensus Mechanisms: Study of different consensus algorithms used in blockchain networks, such as Proof of Work (PoW), Proof of Stake (PoS), and Practical Byzantine Fault Tolerance (PBFT). The course will discuss the security implications of each mechanism and how they help in achieving trust and preventing malicious activities in decentralized networks.

MODULE 2: BLOCKCHAIN IN NETWORK SECURITY

Blockchain Applications in Network Security: Examination of how blockchain technology can be applied to enhance network security. Topics will include decentralized authentication systems, the role of blockchain in identity management, and how it can eliminate the need for centralized authorities in verifying credentials.

Decentralized Authentication: Discussion of blockchain-based authentication systems that provide secure, decentralized methods for verifying identities in a network. Students will learn how blockchain can prevent identity theft, unauthorized access, and other network vulnerabilities by distributing trust across the network.

Practical Lab: Building a Secure Network Using Blockchain: A hands-on lab where students will implement a decentralized authentication mechanism using blockchain. This lab will involve setting up a blockchain network, creating user identities, and managing authentication processes in a secure, trustless environment. Students will also explore how to manage encryption keys and ensure secure data exchanges within the network.

MODULE 3: ADVANCED TOPICS IN BLOCKCHAIN SECURITY

Smart Contracts and Automated Security: Introduction to smart contracts and their role in automating security tasks in a network. Students will learn how to design and deploy smart contracts on a blockchain, ensuring that security policies are enforced automatically without human intervention. Use cases will include automated access control, self-executing security protocols, and real-time threat detection.

Blockchain-Based Data Integrity and Confidentiality: Focus on how blockchain can be used to ensure the integrity and confidentiality of data in a distributed network. Students will explore techniques for encrypting data on the blockchain and ensuring that only authorized parties have access to sensitive information.

Case Studies on Blockchain-Based Cybersecurity Solutions: Real-world case studies on the application of blockchain in network security. These will include blockchain-enabled supply chain security, securing IoT devices, preventing Distributed Denial of Service (DDoS) attacks, and securing communication channels in critical infrastructure. Students will critically evaluate these implementations and understand the benefits and challenges associated with deploying blockchain for cybersecurity purposes.

MODULE 4: CAPSTONE PROJECT

Final Project - Developing a Blockchain-Based Authentication System for Secure Communication Networks: The capstone project will require students to design and implement a blockchain-based authentication and security system for a secure communication network.

This project will involve: Designing the network architecture, Implementing a decentralized authentication protocol, Integrating cryptographic mechanisms for data protection, Deploying smart contracts to automate security policies, Testing and validating the system for real-world applicability.

Students will be required to present their solutions, demonstrating how blockchain enhances the security, scalability, and reliability of the network.

Assessment Methodology

- Short answer based subjective test to assess understanding of concepts
- Research based Assignment related to course

DAV UNIVERSITY
JALANDHAR

Department of Computer Science and Applications

VALUE ADDED COURSE

Cybersecurity and Ethical Hacking

Duration From
January, 2019 to April, 2019

SESSION : 2018-19

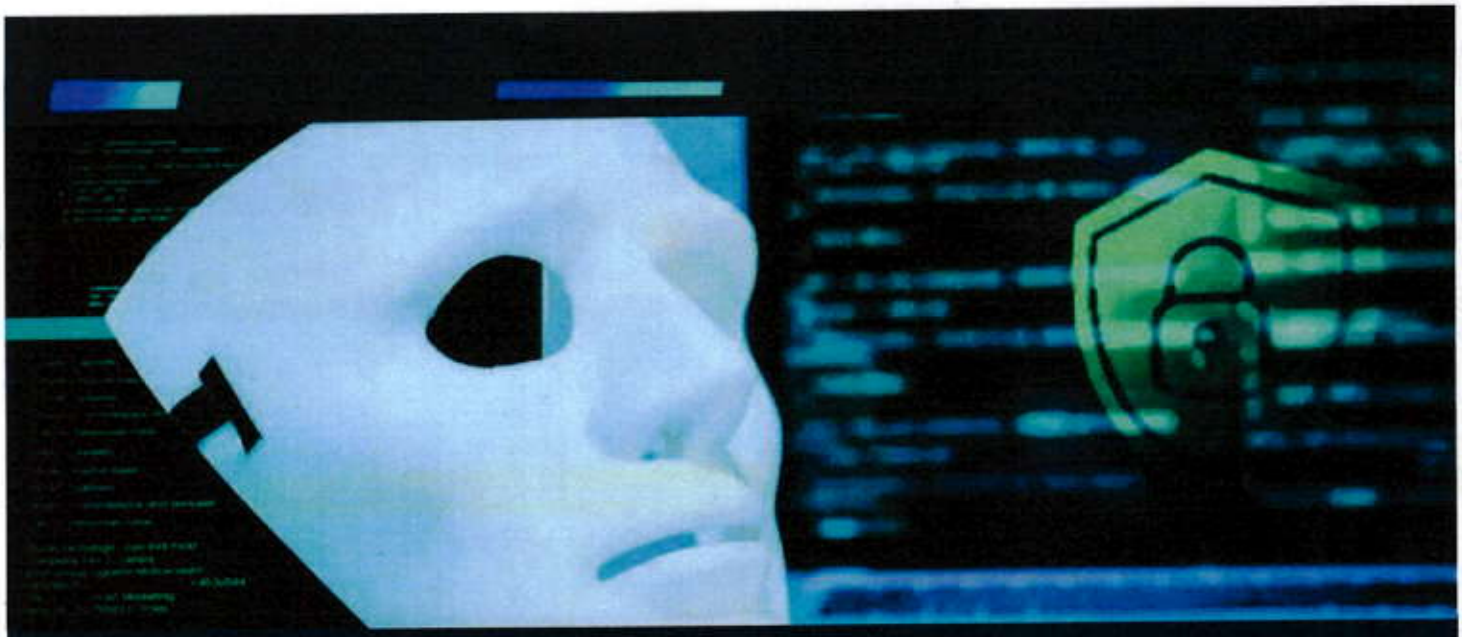
HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab



Course Objectives

- To provide students with knowledge of key cybersecurity concepts and practices.
- To introduce ethical hacking techniques for identifying and mitigating security threats.
- To equip students with hands-on experience in securing networks and systems.

Syllabus Overview

Module 1: Introduction to Cybersecurity

- **Overview of cybersecurity:** Importance, threats, and challenges.
- **Key concepts:** Encryption, firewalls, VPNs, and intrusion detection systems.
- **Hands-on project:** Setting up a basic network security system.

Module 2: Ethical Hacking Fundamentals

- Introduction to ethical hacking and penetration testing.
- **Phases of hacking:** Reconnaissance, scanning, gaining access, maintaining access, covering tracks.
- Hands-on project: Performing a vulnerability assessment on a system.

Module 3: Securing Networks and Systems

- **Network security best practices:** Firewalls, IDS/IPS, network segmentation.
- **System security:** Hardening operating systems and applications.
- **Case study:** Real-world security breaches and lessons learned.

Module 4: Web Application Security

- **Common web vulnerabilities:** SQL injection, cross-site scripting (XSS), cross-site request forgery (CSRF).
- OWASP Top 10 vulnerabilities and mitigation strategies.
- Hands-on project: Identifying and fixing vulnerabilities in a web application.

Module 5: Incident Response and Cybersecurity Future Trends

- Incident response planning and execution.
- The role of AI and machine learning in cybersecurity.
- **Final project:** Developing a cybersecurity incident response plan for an organization.

Assessment Methodology

- Quiz – MCQs to assess understanding of concepts
- Case based assignments

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF SPORTS AND PHYSICAL EDUCATION

VALUE ADDED COURSE

Sports Nutrition and Fitness Coaching

SESSION : 2018-19

Duration From January, 2019 to April, 2019

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- **To provide foundational knowledge of sports nutrition and fitness coaching.**
- **To train students to design personalized fitness and nutrition programs for athletes.**

Syllabus Overview

Module 1: Introduction to Sports Nutrition

- The role of macronutrients (carbohydrates, proteins, fats) in athletic performance.
- Designing personalized nutrition plans for athletes based on their sport and training regimen.

Module 2: Fitness Coaching Techniques

- Strength and conditioning training methods.
- Designing training programs for different types of sports (endurance, strength-based, etc.).

Module 3: Injury Prevention and Recovery

- Common sports injuries (ACL, muscle tears) and prevention techniques.
- Rehabilitation exercises and the role of nutrition in recovery.

Module 4: Mental Conditioning for Athletes

- Techniques for mental toughness, visualization, and stress management.
- Final Project: Developing a comprehensive fitness and nutrition plan for an athlete.
- Resources:
- Nutrition for Sport and Exercise by Marie Dunford and J. Andrew Doyle
- Strength and Conditioning for Sports Performance by Ian Jeffreys and Jeremy Moody

Resources

- *Nutrition for Sport and Exercise* by Marie Dunford and J. Andrew Doyle
- *Strength and Conditioning for Sports Performance* by Ian Jeffreys and Jeremy *Moody*

Assessment Methodology

- **Quiz – MCQs to assess understanding of concepts**
- **Research based Assignment related to course**

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF EDUCATION

VALUE ADDED COURSE

Innovative Teaching Methodologies

SESSION : 2018-19

Duration From
January, 2019 to April, 2019

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Objectives

- **To introduce students to modern teaching methodologies such as flipped classrooms and e-learning.**
- **To equip students with strategies for enhancing student engagement and promoting active learning.**

Syllabus Overview

Module 1: Modern Pedagogical Techniques

- Understanding flipped classrooms, blended learning, and how to implement them.
- Strategies for fostering active learning and student engagement in the classroom.

Module 2: Technology Integration in Education

- Using e-learning platforms like Moodle and Google Classroom to create and manage online courses.
- ***Hands-On Lab:*** Creating digital learning content, including video lectures, quizzes, and e-books.

Module 3: Inclusive Education Strategies

- Teaching strategies tailored for students with special needs, including adaptive technology.
- Case Studies: Successful inclusive education programs from around the world.

Module 4: Final Project

- Students will design and implement a lesson plan using one or more modern teaching methodologies.

Resources

- *The Flipped Classroom: A Comprehensive Guide* by Jonathan Bergmann and Aaron Sams
- *How People Learn: Brain, Mind, Experience, and School* **by John D. Bransford**

Assessment Methodology

- **Oral/poster presentation**
- **Research based Assignment related to course**

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF BOTANY

VALUE ADDED COURSE

Industrial Botany: Applications in Agriculture, Horticulture, and Biotechnology

SESSION : 2018-19

Duration from August, 2018 to October, 2018

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course Description:

This course introduces students to the industrial applications of botany, with a focus on agriculture, horticulture, and biotechnology. Students will explore how botanical knowledge is applied in areas such as crop improvement, sustainable agriculture, plant-based bio-products, and horticultural practices. The course emphasizes the use of plant science to solve industrial challenges related to food security, environmental sustainability, and bioproduct development.

Course Objectives:

By the end of this course, students will be able to:

1. Understand the industrial role of botany in solving agricultural and environmental challenges.
2. Apply plant science to improve crop yields, develop sustainable farming practices, and enhance horticultural production.
3. Develop plant-based bio-products and apply biotechnology for industrial use.
4. Understand the regulatory and environmental aspects of using plant biotechnology in industry.

Syllabus Overview:

Module 1: Industrial Applications of Plant Science in Agriculture

- Methods for improving crop yields and resistance to diseases through traditional breeding and modern biotechnology.
- Using botanical knowledge to promote sustainable farming techniques, such as crop rotation, intercropping, and organic farming.
- Students will perform a plant breeding experiment using selective breeding techniques to enhance traits such as disease resistance and yield.

Module 2: Horticulture and Commercial Plant Production

- Exploring the role of horticulture in ornamental plant production, landscaping, and food production industries.
- Techniques for optimizing plant growth in controlled environments, including the use of hydroponics, aeroponics, and greenhouse management.
- Students will design and set up a small-scale hydroponics or greenhouse system to grow commercial crops.

Module 3: Plant Biotechnology and Genetic Engineering

- Techniques for growing plants in vitro, including micropropagation and regeneration of genetically modified plants.
- The role of genetic engineering in enhancing crop resistance to pests, diseases, and environmental stressors.

Module 4: Plant-Based Bio-Products and Bioprocessing

- The use of plants in producing biofuels, plant-based plastics, pharmaceuticals, and nutraceuticals.
- Exploration of bio-product development in industries such as healthcare, cosmetics, and renewable energy.

Students will extract bioactive compounds from plants and analyze their potential industrial applications, such as in pharmaceuticals or biofuels.

Assessment Methodology

- **Short answer based subjective test to assess understanding of concepts**
- **Research based Assignment related to course**

DAV UNIVERSITY
JALANDHAR

DEPARTMENT OF BIOCHEMISTRY

VALUE ADDED COURSE

INDUSTRIAL BIOCHEMISTRY: APPLICATIONS IN BIOTECHNOLOGY AND PHARMACEUTICALS

Duration from: July, 2018 to November, 2018

SESSION : 2018-19

HELPLINES :

70870-17551 | 70870-17552 | 70870-17553

TOLL FREE 1800-1800-190

www.davuniversity.org

Jalandhar - Pathankot, National Highway (NH 44), JALANDHAR- 144 012, Punjab

Course description:

By the end of this course, students will be able to:

1. Understand the role of biochemistry in industrial processes such as drug development, enzyme production, and diagnostics.
2. Apply biochemical techniques in bioprocessing, including fermentation, bioreactor design, and enzyme immobilization.
3. Analyze and optimize biochemical pathways for industrial applications in biotechnology and pharmaceuticals.
4. Understand regulatory and quality control aspects of biochemical production in the pharmaceutical and biotech industries.

Syllabus Overview:

Module 1: Introduction to Industrial Biochemistry

- The role of biochemistry in industrial sectors such as biotechnology, pharmaceuticals, and healthcare.
- Introduction to the biochemical pathways in biopharmaceuticals, enzymes, and biofuels.

Module 2: Enzyme Technology and Industrial Applications

- Techniques for large-scale enzyme production and immobilization for industrial use.
- Studying the kinetics of enzyme-catalyzed reactions methods for optimizing enzyme performance in industrial processes, enzyme immobilization and activity testing in industrial applications (e.g., biofuel)

Module 3: Bioreactors and Fermentation Technology

- Introduction to bioreactors, types of bioreactors (batch, fed-batch, continuous), and their industrial applications.
- Understanding fermentation processes for the production of biopharmaceuticals, enzymes, and biofuels.

Module 4: Biopharmaceuticals and Drug Development

- Exploration of the biochemical processes involved in pharmaceutics.
- Overview of regulatory requirements, Good Manufacturing Practices (GMP), and quality control in biopharmaceutical production.

Module 5: Biochemical Applications in Diagnostics and Healthcare

- Role of biochemistry in developing diagnostic tools such as biosensors, ELISA, and PCR.

Understanding the biochemical basis of diagnostic assays used for disease detection and monitoring (e.g., diabetes, infectious diseases).

Assessment Methodology

- **Oral/poster presentation**
- **Research based Assignment related to course**