KARNATAK LAW SOCIETY'S

GOGTE INSTITUTE OF TECHNOLOGY

UDYAMBAG, BELAGAVI-590008

(An Autonomous Institution under Visvesvaraya Technological University, Belagavi)
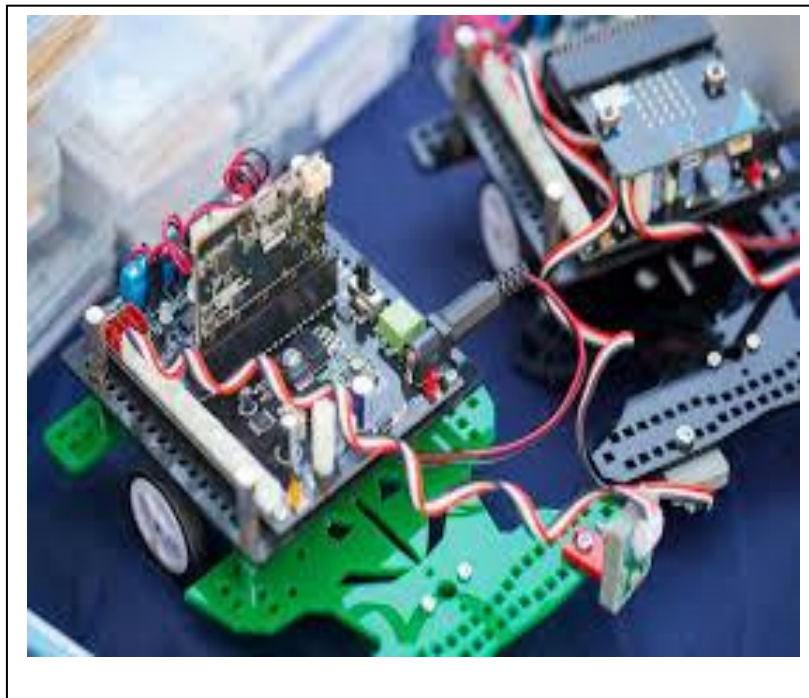
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SKILL LABS

FOR

III Semester ECE Students

DEPARTMENT OF

ECE

KLS GOGTE INSTITUTE OF TECHNOLOGY

IoT System Design using arduino

OF SKILL LAB

FOR

Students of III Semester

Overview

The Skill Lab is a dynamic learning environment designed to equip engineering students with practical, hands-on experience in emerging technologies. It bridges the gap between theoretical knowledge and real-world application by providing access to advanced tools, equipment, and software used in industries today. By offering practical experience, students gain a competitive edge in the job market, making them more attractive to employers in sectors.

Mode of Conduction of each Module

Theory: 12 Hours
Demo: 12 Hours
Lab sessions: 12 Hours
Total duration: 36   Hours
Certification exam: 3 Hours

Module 1: IoT

IOT System Design Using Embedded System, IoT Technology and Applications – Overview Embedded Development Kit.

Module 2: Embedded C

Overview of Hardware Architecture Preparing Sensor Node (Things) Embedded C Arduino API Programming

Module 3: Sensor

contents Interfacing Sensors-Actuators

Module 4: Communication

IoT Communication Models, Implementation of IOT system using HTTP Protocol, Robotics applications

Coordinators

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Outcomes

- List the outcomes of the Skill lab offered by your department.
- In what way will it benefit the students.
- Career prospects

Acceptance

In order to accept and start the training program, students are required to register with the respective department. Details to be provided by the student to the department include: **Name, USN, UID, Mobile No, Email id**

Terms and Conditions

- Only students who have paid a skill lab fee to the institution are eligible for the training.
- Thestudentsmustmaintain90%attendanceforobtaining the skill lab certificate.
- Students must attend training as per scheduled time

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SKILL LABS

FOR

3rd Semester ECE Students

DEPARTMENT OF
ELECTRONICS & COMMUNICATION
KLS GOGTE INSTITUTE OF TECHNOLOGY

Introduction to Generative Artificial Intelligence (Gen AI) using Python: From Basics to Applications

FOR

Students of 3rd Semester

Overview

This course provides a comprehensive introduction to Generative Artificial Intelligence (GenAI) utilizing Python, spanning essential theoretical concepts to practical applications. With a focus on core principles of machine learning and deep learning, participants will engage in hands-on projects to solidify their understanding of various architectures and methodologies, preparing them for real-world applications in AI.

Mode of Conduction of each Module

Theory: 03 Hours
Demo: 02 Hours
Lab sessions: 04 Hours
Total duration: 09 Hours
Certification exam: 1.5 Hours

Module 1: Foundations of AI and Essential Mathematics

- Introduction to Terminology: ML, DL, and GenAI
- Applications in NLP, Computer Vision, and Machine Perception
- Essential Mathematics: Linear Algebra, Probability, Gradient Descent, and Optimization Techniques

Module 2: Artificial Neural Networks & their Applications

- Introduction to ANNs: Perceptrons and Multilayer Architectures
- Activation Functions, Training, and Evaluation Techniques
- Applications in Data Classification: 1D and 2D Data

Module 3: Deep Learning and Generative Models

- Limitations of ANNs and Introduction to Deep Neural Networks (DNNs)
- Deep Learning Architectures: CNNs and Advanced Implementations
- Generative Models: Autoencoders (AE), Variational Autoencoders (VAE), and Generative Adversarial Networks

Module 4: Transformative Techniques and Industry Insights

- Transformers and Attention Mechanisms in NLP and Vision
- Industry Interaction: Expert Talks on GenAI Applications
- Overview of Advances in GenAI and Large Language Models (LLMs)

Coordinators

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Outcomes

- Students will gain a comprehensive understanding of key concepts in machine learning, deep learning, and generative AI, including their applications across various industries.
- Participants will develop hands-on experience in building and training neural networks, including autoencoders and GANs, enabling them to tackle real-world data challenges.
- Students will gain valuable insights into current trends and potential career pathways in generative AI.

Acceptance

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DEPARTMENT OF

Electronics & Communication Engineering

KLS GOGTE INSTITUTE OF TECHNOLOGY
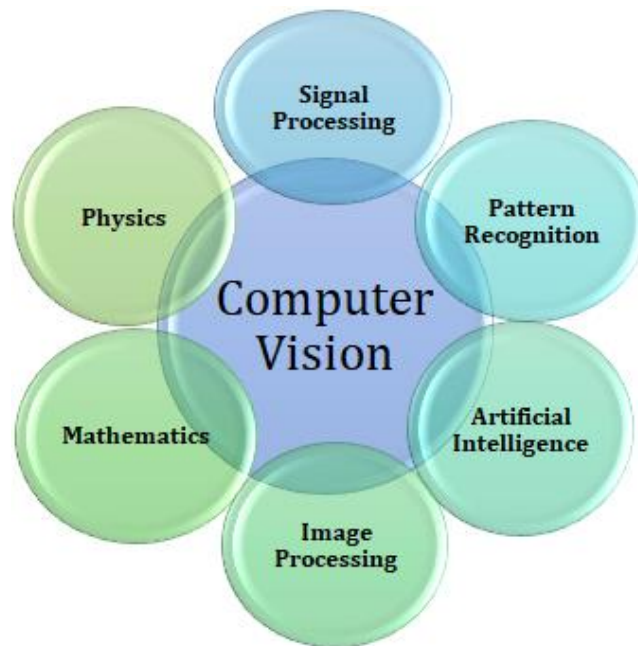
Multi-Domain Knowledge Based Modeling using MATLAB

FOR

Students of U.G. 3rd Semester

Overview

In MATLAB, a **toolbox** is a collection of specialized functions, algorithms, and tools that extend the capabilities of the base MATLAB environment. Toolboxes are designed for specific areas of application, such as signal processing, image processing, statistics, machine learning, control systems, and more.
Toolboxes enhance MATLAB's capabilities, making it a powerful tool for engineers, scientists, and researchers across various fields.

Mode of Conduction of each Module

Theory: 12 Hours	Lab Session: 6 Hours	Hands On sessions: 16 Hours
Certification exam: 2 Hours		Total duration: 36 Hours

Module 1: Basics & GUI

- Basics of MATLAB
- GUIDE and App designer

Module 2: Communication & Signal Processing Toolbox

- Simulating a Communication link
- Applications of signal processing

Module 3: IP & Computer Vision Toolbox

- Low & High level image processing
- Object Recognition

Module 4: Fuzzy Logic Toolbox

- Fuzzy Logic GUI tool
- Case studies

Coordinators

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Outcomes

- **Practical Skills**: A well-designed course provides hands-on experience with MATLAB's core functionalities. Learners can gain proficiency in areas like data manipulation, visualization, programming, and solving mathematical problems.
- **Career Advancement**: MATLAB proficiency is valuable in many industries. Completing this course can demonstrate foundational knowledge to potential employers and enhance career prospects, especially in technical fields.
- **Project-Based Learning**: This course incorporates projects that allow learners to apply their acquired skills to solve real-world problems. This practical approach helps solidify understanding and prepare learners for tackling future challenges.
- **Industry Recognition**: Certificate programs involving MATLAB, can hold more weight with employers.

Acceptance

In order to accept and start the training program, students are required to register with the respective department. Details to be provided by the student to the department include: **Name, USN, UID, Mobile No, Email id**

Terms and Conditions

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- Students must attend training as per scheduled time