Department of Computer Applications

Value Added Course

Code	Title	Hours
VACCAAA25	AI AND AUTOMATION TOOLS	30

Learning Objectives:

- To introduce AI tools that enhance writing, presentation, research, creativity, and career development for students of Arts, Commerce, and Science backgrounds.
- Equip students with real-world AI and automation tools to improve productivity and learning — without writing code.

Course Learning Outcomes:

- Understand and effectively use AI tools
- Create a personal academic and career portfolio
- Improve digital literacy and job readiness
- Students will build real-world projects with no-code tools
- Gain confidence in using next-gen tools across disciplines

Unit 1: Introduction to AI Tools

Use Cases: Writing, summarizing, idea generation, content repurposing
Tools Practiced: ChatGPT / Gemini, Notion AI, Quillbot / Grammarly
Hands-on Tasks:
- Generate answers to academic questions
- Rewrite a paragraph in multiple tones
- Create a personalized study schedule with AI

Unit 2: Creativity with AI (Design, Video, and Presentation)

Use Cases: Posters, videos, PPTs, resumes
Tools Practiced: Canva Magic Tools, Pictory / Lumen5, Tome.app / Beautiful.ai
Hands-on Tasks:
- Create a project poster or resume
- Generate a 1-minute video on "Importance of AI"
- Build a presentation using a single sentence as a prompt

Unit 3: Task Automation Without Coding

Use Cases: Automate repetitive tasks (emails, form entries, file uploads)
Tools Practiced: Zapier, Formcarry / Tally.so + Zapier
Hands-on Tasks:
- Auto-send an email when a form is submitted
- Google Form to Sheet + auto-email summary

- Create a reminder system with Google Calendar + Gmail

Unit 4: App Building with AI – MIT App Inventor

Use Cases: Build simple smart apps (chatbot, productivity, quiz)
Tools Practiced: MIT App Inventor, ChatGPT API (optional via webhook)
Hands-on Tasks:
- Build an AI-based Quote Generator App
- Create a Q&A app using web APIs
- Export the app and install on their phones

Unit 5: AI for Learning, Research, and Career

Use Cases: Academic writing, research, career prep
Tools Practiced: Consensus / Scholarcy / Scite.ai, ResumA.I / Kickresume, Jobscan
Hands-on Tasks:
- Create a research summary from a topic
- Build a resume + get improvement suggestions
- Write a cover letter for your dream job using AI

Capstone Project

Group Projects (Choose one)
- AI-Powered Productivity App (MIT App Inventor)
- Automated Task Workflow (Zapier + Google tools)
- Career Portfolio (Resume + Video + PPT created using AI tools)

Tools Recap (Fully Hands-On):

Category	Tools
Writing/Content	ChatGPT, Gemini, Notion AI, Quillbot
Design/Creative	Canva AI, Pictory, Lumen5, Tome.app
Automation	Zapier, Formcarry, Tally.so, Google Apps
App Building	MIT App Inventor, ChatGPT Webhook
Career/Research	Scholarcy, Consensus, ResumeAI, Jobscan

Value Added Course

Code	Title	Hours
VACCAML25	Machine Learning	30

Learning Objectives:

- To understand the basic theory underlying machine learning.
- To be able to formulate machine learning problems corresponding to different applications.
- To apply the algorithms to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

Course Learning Outcomes:

- Appreciate the importance of visualization in the data analytics solution.
- Apply structured thinking to unstructured problems.
- Understand a very broad collection of machine learning algorithms and problems.
- Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory.
- Develop an appreciation for what is involved in learning from data.

Unit 1: Python for Machine Learning

- Introduction to Python (1 hour)
    - Basics Python for ML
    - Jupyter Notebook & Google Colab basics
- Python Basics (2 hours)
    - Variables, Data Types
    - Conditional Statements, Loops
    - Lists, Tuples, Dictionaries
- Functions & Modules (1 hour)
    - Defining functions
    - Lambda functions
    - Importing libraries
- NumPy & Pandas for Data Handling (2 hours)
    - Array operations using NumPy
    - DataFrames and basic operations using Pandas

Unit 2: Supervised Learning

- Introduction Supervised Learning (0.5 hour)
    - Regression vs Classification
- Linear Regression (1.5 hours)
    - Concept
    - Implementation using scikit-learn
    - Evaluation (MSE, R2)
- Logistic Regression (1 hour)

- Concept
  - Hands-on Classification problem
- Decision Trees & Random Forest (1.5 hours)
  - Concept and differences
  - Hands-on comparison
- K-Nearest Neighbors (1 hour)
  - Understanding KNN
  - Real-world use-case: Classifying images or data points
- Model Evaluation (0.5 hour)
  - Confusion Matrix
  - Accuracy, Precision, Recall

Unit 3: Unsupervised Learning

- Introduction Unsupervised Learning (0.5 hour)
  - Use cases and differences from supervised
- K-Means Clustering (2 hours)
  - Concept
  - Clustering customer data
- Hierarchical Clustering (1 hour)
  - Dendrograms and implementation
- Dimensionality Reduction (1 hour)
  - PCA Concept
  - Visualizing high-dimensional data
- Anomaly Detection (1 hour)
  - Use case: Fraud detection
- Mini Project (0.5 hour)
  - Clustering-based hands-on task

Unit 4: Reinforcement Learning

- Introduction to Reinforcement Learning (1 hour)
  - Agent, Environment, Reward
- Q-Learning Basics (1.5 hours)
  - Simple Grid World example
  - Code walkthrough
- Exploration vs Exploitation (0.5 hour)
  - Epsilon-greedy strategy
- Hands-on: Training a simple agent (2 hours)
  - Using Python and OpenAI Gym
  - Visualizing agent behavior
- Real-world Applications (1 hour)
  - Gaming, Robotics, Recommendations

Unit 5: Deep Learning, CV & NLP Basics

- Intro to Neural Networks (1 hour)
  - Neuron, Layers, Activation
- Building Neural Network (1.5 hours)

- Using Keras or TensorFlow
- MNIST Handwritten Digits classification
- Intro to Computer Vision (1 hour)
  - Image preprocessing
  - Real-world demo: Image classifier
- NLP Basics (1 hour)
  - Tokenization, Stopwords
  - Text classification task
- Sentiment Analysis Project (1.5 hours)
  - Using movie reviews or tweets
  - Build & deploy simple sentiment model