A **knowledge-based chatbot** can offer a wide range of features depending on its use case, domain, and level of intelligence. Below are the key features categorized into different aspects:

**1. Core Functionalities**

✅ **Natural Language Understanding (NLU)** – Interprets user input using NLP techniques.  
✅ **Conversational Context Retention** – Maintains context across multiple user interactions.  
✅ **Multi-Turn Conversations** – Engages in back-and-forth discussions, remembering prior inputs.  
✅ **Multi-Language Support** – Communicates in multiple languages using translation models.  
✅ **Sentiment Analysis** – Detects user sentiment and adapts responses accordingly.  
✅ **Question-Answering System** – Retrieves relevant knowledge from a predefined database.  
✅ **Entity Recognition** – Identifies specific data points like names, dates, and locations.  
✅ **Personalization** – Customizes responses based on user history, preferences, or role.

**2. Knowledge Management & Retrieval**

📚 **Document & FAQ-based Knowledge Retrieval** – Uses embeddings, search, or retrieval-augmented generation (RAG) to fetch answers. (Embedding model: all-MiniLM-L6-v2)  
📚 **Contextual Search & Summarization** – Finds relevant sections in long documents or articles.  
📚 **Ontology-Based Reasoning** – Uses structured knowledge graphs to enhance response accuracy.  
📚 **Database Integration** – Queries structured data from SQL/NoSQL databases.  
📚 **API-Based Data Fetching** – Fetches external data dynamically via API calls.  
📚 **Multi-Source Knowledge Aggregation** – Pulls information from multiple sources, including web, PDFs, research papers, and internal wikis.  
📚 **Dynamic Content Updates** – Auto-updates the knowledge base with the latest information.

**3. AI & Machine Learning Capabilities**

🤖 **Machine Learning-Based Response Generation** – Uses LLMs to generate intelligent responses.  
🤖 **Fine-Tuned LLMs for Specific Domains** – Customizes responses for industries like healthcare, fintech, and legal services.  
🤖 **AI-Powered Recommendations** – Suggests related topics, articles, or next actions.  
🤖 **Intent Recognition & Classification** – Identifies user goals and categorizes queries.  
🤖 **Semantic Similarity Matching** – Matches user queries with similar questions from past interactions.

**4. Advanced Interaction Capabilities**

💬 **Voice & Speech Processing** – Supports voice-to-text and text-to-speech capabilities.  
💬 **Multimodal Support** – Interprets text, images, and audio inputs.  
💬 **Interactive Forms & Surveys** – Collects structured data through guided inputs.  
💬 **Document Upload & Analysis** – Parses and extracts key information from uploaded files.  
💬 **Live Chat Escalation** – Transfers conversations to a human agent when needed.  
💬 **Auto-Summarization of Conversations** – Generates summaries of long chat sessions.  
💬 **Context-Aware Actions** – Triggers predefined workflows based on user intent.

**5. Security & Compliance**

🔒 **Role-Based Access Control (RBAC)** – Restricts access to sensitive information based on user roles.  
🔒 **Data Anonymization & Encryption** – Ensures secure handling of personal data.  
🔒 **Compliance with GDPR, HIPAA, PCI DSS** – Adheres to industry-specific regulatory standards.  
🔒 **Audit Trails & Logs** – Maintains records of interactions for compliance and troubleshooting.

**6. Integration & Deployment**

🔗 **Multi-Platform Deployment** – Works across web, mobile, WhatsApp, Slack, Teams, and email.  
🔗 **CRM & ERP Integration** – Connects with platforms like Salesforce, SAP, and HubSpot.  
🔗 **E-Commerce & Payment Integration** – Supports product recommendations and checkout assistance.  
🔗 **AI Model Deployment on Cloud & On-Premise** – Supports deployment on AWS, Azure, GCP, or local servers.  
🔗 **Plug-and-Play APIs** – Enables external applications to fetch responses.  
🔗 **Web Scraping & Data Enrichment** – Collects and updates knowledge from web sources.

**7. Analytics & Performance Monitoring**

📊 **User Behavior Analytics** – Tracks conversation trends and user preferences.  
📊 **Chatbot Performance Metrics** – Measures accuracy, response time, and engagement levels.  
📊 **Heatmaps & Usage Insights** – Visualizes frequently asked questions and user pain points.  
📊 **A/B Testing for Responses** – Compares different chatbot responses for effectiveness.

**8. Customization & Scalability**

⚙ **Customizable Personality & Tone** – Adapts chatbot responses to match brand voice.  
⚙ **Scalable Infrastructure** – Handles high volumes of queries without performance degradation.  
⚙ **Multi-Agent Collaboration** – Allows multiple AI agents to work together on complex queries.