Report on Identification of Relevant AI Tools

for the BSc Applied AI & Data Science Program

1. Understanding the Task and Program Context

As instructed, the objective of this task was to **identify relevant AI tools** that can be taught to students enrolled in the **BSc program**. The task involved understanding:

- The **context of the BSc program** from the official website and brochure
- The **type of students involved** (undergraduate, beginner to intermediate level)
- The **nature of learning** (conceptual foundations + applied, hands-on exposure)

The BSc Applied AI & Data Science program is structured to gradually build students' capabilities—from foundational AI and data concepts to advanced applications such as machine learning, generative AI, and conversational AI. Therefore, the selected AI tools must be:

- Easy to understand for undergraduate students
- Suitable for teaching and classroom demonstrations
- Useful across multiple subjects and semesters
- Relevant to current industry practices

Based on this understanding, **three AI tools** were researched and selected for inclusion in this report.

2. Criteria Used for Selecting AI Tools

The following criteria were used to evaluate and shortlist AI tools:

1. **Educational suitability** – Can be understood by BSc students
2. **Teaching convenience** – Easy for lecturers to explain and demonstrate
3. **Curriculum alignment** – Supports AI, ML, GenAI, and applied learning topics
4. **Practical value** – Useful for labs, assignments, and projects
5. **Industry relevance** – Reflects modern AI workflows

3. Selected AI Tools for the BSc Program

Tool 1: LlamaIndex

Category: Generative AI & LLM-based Systems

Overview

LlamaIndex is an AI framework that enables Large Language Models (LLMs) to interact with **custom data sources** such as documents, PDFs, and structured datasets. It helps students understand how modern generative AI systems retrieve information and generate context-aware responses.

Why It Is Relevant for the BSc Program

- Aligns with Generative AI and LLM-related subjects
- Helps students understand AI system architecture, not just AI usage
- Demonstrates real-world applications of GenAI

How It Can Be Taught

- Demonstrating how AI answers questions using course documents
- Building simple document-based AI assistants
- Explaining concepts like retrieval, context, and response generation

Student Learning Outcomes

- Understanding of how GenAI systems work internally
- Practical exposure to LLM-based applications
- Improved reasoning about AI outputs

Tool 2: Gradio

Category: Applied AI Application Development

Overview

Gradio allows students to create **interactive interfaces** for AI and machine learning models with minimal code. It helps convert models into user-facing applications, making AI outputs visible and easy to interpret.

Why It Is Relevant for the BSc Program

- Encourages applied learning
- Makes AI models interactive and demonstrable
- Suitable for machine learning, NLP, and computer vision subjects

How It Can Be Taught

- Creating simple interfaces for ML models
- Demonstrating real-time predictions
- Using Gradio for project demos and evaluations

Student Learning Outcomes

- Better understanding of how AI models behave

- Hands-on experience with AI applications
- Improved confidence in presenting AI projects

Tool 3: AutoGen

Category: Multi-Agent AI Systems

Overview

AutoGen is a modern AI framework that enables multiple AI agents to collaborate on tasks. Each agent can have a specific role, such as planning, executing, or reviewing, which reflects how complex AI systems operate in practice.

Why It Is Relevant for the BSc Program

- Aligns with Foundations of AI and Generative AI concepts
- Introduces students to emerging AI system designs
- Encourages logical and algorithmic thinking

How It Can Be Taught

- Explaining agent roles using real-world teamwork examples
- Demonstrating task decomposition using AI agents
- Building simple collaborative AI workflows

Student Learning Outcomes

- Understanding of agent-based AI systems
- Exposure to modern AI architectures
- Improved problem-solving and system-design skills

4. How These Tools Support Learning Across the Program

Learning Aspect	Tool Used
Generative AI & LLM understanding	LlamaIndex
Applied AI & project demonstrations	Gradio
AI reasoning & system workflows	AutoGen

These tools collectively support:

- Conceptual understanding
- Practical experimentation
- Project-based learning
- Industry-aligned AI exposure

5. Conclusion

Based on the task requirements and analysis of the BSc Applied AI & Data Science program, the following AI tools are recommended for teaching and learning purposes:

1. **LlamaIndex** – for Generative AI and LLM-based systems
2. **Gradio** – for applied AI applications and model demonstrations
3. **AutoGen** – for understanding modern AI workflows and agent-based systems

These tools are suitable for undergraduate students, convenient for lecturers to explain, and aligned with the applied and industry-focused nature of the BSc program. Incorporating them into the curriculum can significantly enhance hands-on learning and better prepare students for real-world AI roles.