Government of West Bengal
Department of Science & Technology and Biotechnology (DSTBT)
Vigyan Chetana Bhavan, Block-DD, Plot-26/B,
Sector-I Salt Lake, Kolkata-700064

Application Format for Science Popularization Programme

1. Programme Type (ref SN 11 of the Memorandum): **Workshop** ……..……

2. Title of the proposed Programme: **Large Language Models (LLMs) and Generative AI**...

3. Target Group (Faculty, Teacher, Research Scholar, School/College/ University Student, Community):
   UG Students (CSE / IT /Allied branches ECE / EE) PG Students (CSE/ECE)
   Faculty Members

4. Duration (days): **5 days**; Tentative Dates of the proposed Programme: **23.02.26 to 27.02.26**

5. Aims, Objectives and Details of the Programme (attach separate sheet, if necessary): ....

The primary objectives of this workshop are to:

1. Provide foundational understanding of Large Language Models and transformer-based architectures.
2. Enable participants to effectively use pre-trained LLMs for real-world tasks.
3. Introduce prompt engineering and retrieval-augmented generation techniques.
4. Demonstrate integration of Knowledge Graphs with LLMs for explainable AI.
5. Train participants in fine-tuning, agent design, and deployment of LLM-based applications.

Duration: 5 Days (25 Hours Total Each Day: **5 Hours**

- First Half: Theory (2.5 Hours)
- Second Half: Practical (2.5 Hours)

Course Outcomes (COs)

After successful completion of the workshop, participants will be able to:

- CO1: Explain the working principles of transformers and large language models.
- CO2: Apply prompt engineering techniques to control and optimize LLM outputs.
- CO3: Design and implement Retrieval-Augmented Generation (RAG) systems.
- CO4: Construct and utilize Knowledge Graphs integrated with LLMs for structured reasoning.
- CO5: Fine-tune, evaluate, and deploy LLM-based intelligent applications.

Detailed Syllabus

Day 1: Foundations of Large Language Models

Theory

- Evolution of Natural Language Processing
- Language Modeling concepts
- Tokenization and embeddings
- Transformer architecture
- Encoder–decoder models
- Overview of popular LLMs (GPT, BERT, LLaMA, T5)
- Challenges and limitations of LLMs

Practical

- Python environment setup
- Introduction to Hugging Face ecosystem
- Tokenization and embedding visualization
- Running a pre-trained LLM for text generation

Day 2: Prompt Engineering and LLM Behavior Control

Theory

- Prompt engineering fundamentals
- Zero-shot, few-shot, and chain-of-thought prompting
- Sampling strategies: temperature, top-k, top-p
- Prompt optimization techniques
- Ethical considerations and responsible AI usage

Practical

- Designing effective prompts
- Prompt-based summarization and question answering
- Prompt tuning for accuracy and consistency
- Mitigating hallucination through constraints

Day 3: Retrieval-Augmented Generation (RAG)

Theory

- Limitations of parametric knowledge in LLMs
- RAG architecture and workflow
- Document chunking and embedding strategies
- Vector similarity search
- Comparison of RAG and fine-tuning

Practical

- Document ingestion (PDF/Text)
- Embedding generation
- Vector database creation using FAISS
- Question answering over custom documents

Day 4: Knowledge Graphs and LLM Integration

Theory

- Introduction to Knowledge Graphs
- Entities, relationships, and triples
- Knowledge Graph vs vector databases
- KG-augmented LLMs and GraphRAG
- Domain-specific applications

Practical

- Knowledge Graph construction using Neo4j
- Entity and relation extraction using LLMs
- Querying graphs with Cypher
- LLM-driven reasoning over knowledge graphs

Day 5: Fine-Tuning, Agents, and Deployment

Theory

- Fine-tuning strategies for LLMs
- Parameter-efficient fine-tuning (LoRA, PEFT)
- LLM agents and tool-calling
- Model evaluation metrics
- Deployment considerations and career pathways

Practical

- Fine-tuning a small LLM using LoRA
- Building an LLM agent using tools
- Developing a simple LLM-based application
- Mini-project development and presentation

Assessment Methodology

- Continuous assessment through hands-on tasks
- Participation and interaction

Learning Resources / Tools

- Python, Jupyter Notebook
- Hugging Face Transformers
- LangChain
- FAISS Vector Database
- Neo4j Graph Database
- Streamlit (for deployment demo)

6. Name, Designation, Postal Address, mobile no. and e-mail id of the (only one) Programme Co-ordinator (PC) (attach separate sheet, if necessary):

DR. SUBHRAPRATIM NATH
Head of Department, Department of CSE, Meghnad Saha Institute of Terchnology
Techno Complex, Madurdaha, Ucchepota, Kolkata 700150, WB, India
9830928343
subhrapratim.nath@msit.edu.in

7. Legal status of the Institute (School/College/ University/ Institute/ Polytechnic/ ITI/ Autonomous body/ registered NGO/ Trust etc.):
Engineering college/Institute affiliated under AICTE and MAKAUT, CSE program accredited by NBA

8. Date wise detail Programme Schedule (attach separate sheet, if necessary): .....

9.

Workshop on Large Language Models (LLMs) and Generative AI					
Routine Schedule					
	10.30am- 11.30am	11.30pm- 1.30pm	1.30pm-2pm	2pm-3.30pm	3.30pm-4.30pm
Day 1	Inaguration	Invited Talk 1	Break	Practical Session 1	
Day 2	Invited Talk 2		Break	Practical Session 2	
Day 3	Invited Talk 3		Break	Practical Session 3	
Day 4	Invited Talk 4		Break	Practical Session 4	
Day 5	Invited Talk 5	Invited Talk 6	Break	Practical Session 5	Valedictory Session

10. Collaborating Institutions/ Organizations, if any, with their specific contribution:.....
NA

11. Expected number of participants and list of Resource Persons/ Invited Speakers: .....
Expected number of Partcipants: UG and PG: 100 Faculty: 50

List of Resource Persons/ Invited Speakers:

1. **Prof. Sivaji Bandyopadhyay, Professor, Dept. of CSE, Jadavpur University**
2. **Prof. Jamuna Kanta Sing, Professor, Dept. of CSE, Jadavpur University**
3. **Prof. Asit Kumar Das, Professor, Dept. of CST, IIEST Sibpur**
4. **Prof. Sanku Bose, VC, Sister Nivedita University**
5. **Dr. Sudip Kumar Naskar, Assoc. Professor, Jadavpur University**
6. **Dr. Dipankar Das, Assistant Professor, Jadavpur University**
7. **Mr. Sangeet Suvra Dey, Dell Technology, Hyderabad**
8. **Mr. Sayantan Chakraborty, Director, AIFC, India.**

12. Give details of the grant received from DSTBT in last three Financial Years, if any along with the date of submission of UC, Audited SoE, Report etc.:
.....
NA

13. Name and address of the authority to whom the allotted amount is to be credited (if sanctioned) who will also be responsible for submitting the UC, audited SoE, Programme Completion Report, Feedback, Still and Video photographs etc. of the grant:…….
Responsible person: Dr. Subhrapratim Nath, HOD, Dept. of CSE.

Address of Authority: Meghnad Saha Institute of Technology, Techno Complex, Madurdaha, Beside NRI Complex, Uchhepota, Kolkata – 700150, WB, India.

14. Total Estimated Expenditure (**A**)/ Organisation's contribution (**B**)/ Contribution from any other sources (**C**) / Grant expected from DSTBT(**D**):
D : ₹ 1,00,000 = (**A**: ₹ 1,30,000 – **B**: ₹ 30,000 − C: ₹ 0)
(provide detail Budget break-up as per Annexure-I and Bank details as per Annexure-II):

Check List (put tick) of attachments to be submitted with the application

- Proposed Total Budget with break-up (Annexure-I) and Bank Details (Annexure-II) in Institute/ Organization's letter head: **YES**
- For registered NGO/ Trust, filled in Application Format recommended by the appropriate Recommending Authority, viz., the case may Jt.BDO/ BDO/ SDO/ DM/ Executive Officer- Municipality/ Commissioner-Municipal Corporation as be (where the programme is actually going to be held): **NO/ NA**
- For registered NGO/ Trust, attested copies of the registration certificate, latest renewal certificate, Memorandum and Rules & Regulations of the Organization, last three years Audited Statement of Accounts, Annual Reports etc., List of recommended beneficiaries: **NO/ NA**

DECLARATION

Certified that the details furnished in the filled in format are correct to the best of our knowledge & belief and that the amount of financial assistance, if sanctioned, will be utilized for the purpose for which it is granted within the time as prescribed by DSTBT. We also undertake to abide by the General Guidelines and Terms & Condition prescribed by DSTBT and provide due coverage to DSTBT during the Programme and publications/ print and electronic media made from the Programme in future. We also declare that within one month after completion of the Programme we shall submit the Utilisation Certificate (UC), Audited Statement of Expenditure (Audited-SoE), Programme Completion Report, Feedbacks from the Participants, still and video photographs etc.

Signature: 15/12/25

Date: 15/12/25

Name of Programme Coordinator: Dr. Subhrapratim Nath

Designation: Head of Department

Address: Dept. of CSE. Meghnad Saha Institute of Tech. Kol-150 **(Office Seal)**

Signature: 15/12/25

Date: 15/12/25

Principal
Meghnad Saha Institute of Technology

Name of Head of the Institution: Dr. Manash Chanda

Designation: Principal

Address: Meghnad Saha Inst. of Technology, Kol-150

RECOMMENDATION

(only for registered NGO/ Trust)

Certified that the said Organisation is reputed in this field and I/ we recommend the said proposal for getting grant-in-aid from DSTBT, Govt of West Bengal for the benefit of the local College/ University Students/ Community etc.

Signature:

Date:

Name of Recommending Authority:

Designation:

(Office Seal)

Address:

Meghnad Saha Institute of Technology
TECHNO COMPLEX, MADURDAHA, BESIDE NRI COMPLEX, UCHHEPOTA, KOLKATA-700 150, WEST BENGAL
Phone : 7044598807, Website : www.msit.edu.in

Annexure-I

Proposed Total Budget with break-ups

A. Total Estimated Expenditure

Sl. No.	Items required with justification and rate	Total Expenditure(A) (₹)
1.	Honorarium to Resource Persons/ Experts	50,000
2.	Study materials, Consumables expenses	2000
3.	Hall rent,ifany	NA
4.	Publicity materials	2000
5.	Travel expenses	1000
6.	T.A.to the external Resource Persons/Experts	8000
7.	Documentation expenses including audio-visual	5000
8.	Light refreshments	50000
9.	Auditors'fee	2000
10.	Other expenses, if any (please specify) Folder/pad/pen for participants:	10000
	Grand Total Expenditure(₹):	130000

Pleasemention:

B. Institution/ Organization Contribution* in ₹30000

C. Contribution from any other sources (with name & Address)in₹ NA

D. Grant expected from DSTBT (₹)=(A-B-C) **100000(1 Lakh)**

15/12/25

Signature of Authorised Personnel with seal

Principal
Meghnad Saha Institute of Technology

If C=0
Undertaking: This organization/ institution is not receiving any kind of financial assistance from any other sources

15/12/25

Head of the Department
Dept. of Computer Science and Engineering
Meghnad Saha Institute of Technology

Signature of Authorised Personnel with seal

*Atleast10%ofthetotalbudgetcontributionfromtheInstitute/Organizationisdesirable

Meghnad Saha Institute of Technology
TECHNO COMPLEX, MADURDAHA, BESIDE NRI COMPLEX, UCHHEPOTA, KOLKATA-700 150, WEST BENGAL
Phone : 7044598807, Website : www.msit.edu.in

Annexure-II

Bank details of the Applicant Organisation

Name of the Organization	**Meghnad Saha Institute of Technology**
Bank Account number & Name of the Account holder/Organization	**4548002100001557** **Meghnad Saha Institute of Technology**
Type of Account (Savings or Current A/c)	**Current**
Name of the Bank	**Punjab National Bank**
Name of the Branch with Branch address	**Salt Lake City, Sector-V, Branch**
IFSC of the Branch	**PUNB0454800**
Mobile Number of the Programme Coordinator/ Head of the Organization	**9830928343**
PAN/ TAN of the Account holder/Organization	**AABTA0977D**

15/12/25

Signature of Authorised Personnel with seal

Principal
Meghnad Saha Institute of Technology