

# ASSIGNMENT

## CS 8209: INTRODUCTION TO FORMAL METHODS

### FUTURE TRENDS AND EMERGING DIRECTIONS IN FORMAL METHODS

#### Instructions:

- Answer **all questions** clearly and concisely.
- Support your arguments with **examples** from **recent research** or **real-world applications**.
- **Cite your sources** where applicable (APA, IEEE, or any accepted format).
- Submit your completed assignment as a **PDF** or **Word document** by **23/04/2025**.
- Ensure clarity, coherence, and critical thinking in your responses.

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#### Part A: Research-Based Questions (Short Answer)

##### 1. Emerging Technologies

Identify **two emerging technologies** (such as AI, quantum computing, blockchain, autonomous systems) and explain **how they could benefit from formal methods**.

*(Approx. 200 words per technology)*

##### 2. Advances in Formal Methods Research

Discuss **one recent advancement** (within the last 5 years) in formal methods research.

- Summarize the advancement.
- Explain its significance and potential future impact.

*(Approx. 250 words)*

### 3. Challenges in Adopting Formal Methods

Describe **two main challenges** industries face when trying to adopt formal methods.

- Provide real-world examples where possible.

*(Approx. 200–250 words)*

## Part B: Application and Critical Thinking

### 4. Application Scenario

Imagine you are designing a **critical system** (e.g., self-driving car controller, smart medical device).

- Suggest **one formal method** you would use to verify the system.
- Explain **why you selected** that formal method.
- Highlight **potential obstacles** in applying it.

*(Approx. 300 words)*

### 5. Future Directions

Predict **how formal methods might evolve** in the next 10 years considering the influence of emerging technologies and AI.

- Mention at least **one opportunity** and **one challenge**.

*(Approx. 250–300 words)*

## Evaluation Criteria:

Criteria	Marks
Understanding of Concepts	20
Application of Knowledge	20
Research and Citation	20
Critical Thinking	20
Clarity and Presentation	20
<b>Total</b>	<b>100</b>