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**Requirements (functional and non-functional) of**

**the Gemini project**

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I choose Create a Science Plan and Collect Astronomical Data in the Gemini Telescope Control System (GTCS)

## Functional Requirements:

**Create a Science Plan**

- users must be able to access the 'Create Science Plan' page.
- Users must be able to input basic information about scientific plans, including:
- plan name
- Observation target
- Observation time window
- users must be able to select appropriate observation modes and telescope configurations.
- system must verify the integrity and correctness of input data before submitting the plan.
- If the data is incomplete or incorrect , the system must provide error information to the user and allow them to re edit the plan.
- After submitting the scientific plan in , the system must store the plan in the database and generate a unique plan ID.
- The system must display confirmation information to the user that a scientific plan has been successfully created.

**Collect Astronomical Data**

- users must be able to access the 'Collect Astronomical Data' function.
- The system must be able to establish a connection with the telescope data acquisition module and retrieve the latest observation data.
- The system must be able to display data summary information, including:

- Observed Time
- DATA FILE NAME
- Data status
- users must be able to choose between storing or downloading data.

- The  system must ensure that data is stored in the database and provide confirmation of successful storage.
- If data storage fails in , the system must provide an option for re storage and display an error message to the user.
- If  cannot connect to the telescope data module, the system must notify the user and allow them to retry later.
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**Non-Functional Requirements**:

1. System Performance
    - The  system must load the "Create Science Plan" page and the "Collect Astronomical Data" page within 3 seconds.
    - After submitting the  scientific plan, the system must complete data storage and return the plan ID within 5 seconds.
    - The connection time between the  data collection module and the telescope shall not exceed 10 seconds.

2. Security
    - Only astronomers and scientific observers with valid permissions can access relevant functions.
    - All user interactions and data storage must be transmitted through an encryption protocol .
    - All scientific plans and observational data must be stored in controlled databases and comply with access control policies.
3. Usability
    - UI design must be clear and intuitive, and users should be able to learn how to create scientific plans or collect data within 30 seconds.
    - Error messages must be easy to understand and provide clear operational guidelines.
    - When a scientific plan or data storage fails, the system must provide clear recovery options that allow users to try again.