**1. Use Case Specifications**

**Use Case ID: UC001**

**Use Case Name:** User Registration  
**Relevant Requirements:** SR3  
**Primary Actor:** Library Member  
**Pre-conditions:** The user must not already have an account.  
**Post-conditions:** A new user account is created, and login credentials are issued.  
**Basic Flow or Main Scenario:**

1. The user navigates to the registration page.
2. The user enters personal details (name, address, contact number, and unique membership ID).
3. The system validates the entered information.
4. The system creates a new user account.
5. The system sends confirmation and login credentials to the user.  
   **Extensions or Alternate Flows:**

* If a membership ID is already in use, the system notifies the user and prompts re-entry.
* If required fields are left empty, an error message is displayed.  
  **Exceptions:**
* System failure while processing the request.
* Network connectivity issues.  
  **Related Use Cases:** User Login (UC002)

**Use Case ID: UC002**

**Use Case Name:** User Login  
**Relevant Requirements:** SR4  
**Primary Actor:** Library Member, Library Staff  
**Pre-conditions:** The user must have a registered account.  
**Post-conditions:** The user gains access to system functionalities.  
**Basic Flow or Main Scenario:**

1. The user enters their username and password.
2. The system verifies the credentials.
3. If valid, the user is granted access.
4. If invalid, an error message is displayed.  
   **Extensions or Alternate Flows:**

* If the password is incorrect multiple times, the account is temporarily locked.
* If the user forgets their password, they can request a reset.  
  **Exceptions:**
* Server downtime prevents authentication.
* Unstable internet connection.  
  **Related Use Cases:** User Registration (UC001)

**Use Case ID: UC003**

**Use Case Name:** Search for Resources  
**Relevant Requirements:** SR6  
**Primary Actor:** Library Member  
**Pre-conditions:** User must be logged in.  
**Post-conditions:** The system displays search results based on user query.  
**Basic Flow or Main Scenario:**

1. The user enters a search query (title, author, category).
2. The system retrieves matching resources.
3. The system displays available resources.  
   **Extensions or Alternate Flows:**

* If no matching resources are found, the system notifies the user.  
  **Exceptions:**
* Database failure prevents search execution.  
  **Related Use Cases:** Borrow Resource (UC004)

**Use Case ID: UC004**

**Use Case Name:** Borrow Resource  
**Relevant Requirements:** SR7, SR8  
**Primary Actor:** Library Member  
**Pre-conditions:** The user must be logged in and the resource must be available.  
**Post-conditions:** The system updates the resource status to "Checked Out" and records the loan transaction.  
**Basic Flow or Main Scenario:**

1. The user selects an available resource.
2. The system verifies the user’s borrowing limit.
3. The system updates the resource status.
4. The system records the transaction.
5. The system notifies the user of the due date.  
   **Extensions or Alternate Flows:**

* If the user has overdue books, borrowing is restricted.
* If the resource is reserved by another user, borrowing is not permitted.  
  **Exceptions:**
* Database failure prevents the transaction from being recorded.  
  **Related Use Cases:** Search for Resources (UC003), Return Resource (UC005)

**Use Case ID: UC005**

**Use Case Name:** Return Resource  
**Relevant Requirements:** SR13  
**Primary Actor:** Library Member  
**Pre-conditions:** The user must have a borrowed resource.  
**Post-conditions:** The resource status is updated to "Available."  
**Basic Flow or Main Scenario:**

1. The user selects the resource to return.
2. The system verifies the transaction.
3. The system updates the resource status.
4. The system records the return transaction.
5. The system notifies the user of any overdue fees.  
   **Extensions or Alternate Flows:**

* If the resource is damaged, the system prompts a damage fee.  
  **Exceptions:**
* System failure prevents status update.  
  **Related Use Cases:** Borrow Resource (UC004)

**Use Case ID: UC006**

**Use Case Name:** Overdue Notification  
**Relevant Requirements:** SR9  
**Primary Actor:** System  
**Pre-conditions:** A resource must be overdue.  
**Post-conditions:** The user is notified about the overdue resource.  
**Basic Flow or Main Scenario:**

1. The system identifies overdue resources.
2. The system sends notifications to the respective users.
3. The system updates the notification log.  
   **Extensions or Alternate Flows:**

* If the user does not respond, additional reminders are sent.  
  **Exceptions:**
* Email server failure prevents notification delivery.  
  **Related Use Cases:** Return Resource (UC005)