Some example scenarios for mechatronic systems that you can consider for your final project:

Automated Plant Watering System:

Design a system that monitors soil moisture levels and automatically waters plants when they are dry. The system could use soil moisture sensors, water pumps, and a microcontroller to control the watering schedule.

Smart Door Lock System:

Create a door lock system that uses biometric sensors (such as fingerprint or facial recognition) for access control. Incorporate electronic locks, sensors, and a control unit to manage entry and security.

Autonomous Mini Robot:

Design a small robot that navigates a maze or follows a predefined path. Use infrared sensors for obstacle detection, motor drivers for movement, and programming to control its behavior.

Automated Pet Feeder:

Develop a system that dispenses food for pets at specified intervals. Use weight sensors to measure food levels, a conveyor belt or auger mechanism to dispense food, and a user interface for setting feeding times.

Smart Home Lighting Control:

Create a lighting control system that adjusts indoor lighting based on ambient light levels and occupancy. Utilize light sensors, motion detectors, and smart bulbs to achieve energy-efficient lighting.

Gesture-Controlled Robot Arm:

Build a robotic arm that can be controlled using hand gestures. Incorporate accelerometers or flex sensors to capture hand movements and translate them into robotic arm actions.

Automated Greenhouse Climate Control:

Design a system that monitors temperature and humidity levels in a greenhouse and adjusts ventilation and heating systems accordingly. Use temperature and humidity sensors, fans, and heaters for control.

Smart Mirror:

Create a mirror that displays weather information, news updates, and notifications. Integrate a display screen, touch sensors, and Wi-Fi connectivity for data retrieval.

Wireless Home Security System:

Develop a security system that uses cameras and motion detectors to monitor the home. Design an app that allows users to view live feeds and receive alerts on their smartphones.

Health Monitoring Wearable:

Design a wearable device that tracks vital signs like heart rate, body temperature, and activity levels. Utilize sensors, wireless communication, and data analysis to provide real-time health insights.

Note:

You are encouraged to choose a scenario that interests you and aligns with your skills. You can modify these scenarios or combine elements from multiple scenarios to create a unique mechatronic system that addresses a specific problem or need. However, these scenarios are starting points and you can choose your own scenario excluded from this list.