AAI DAYP: 2025 Spring Schedule

Week 1: Foundations of Industrial Automation

- **Day 1: Program Orientation & Introduction to Automation**
  - Overview of automation's role in modern industries
  - Safety guidelines and lab expectations
  - Team-building activities
- **Day 2: Industrial Robotics Overview**
  - Types of robots (articulated arms, SCARA, delta, etc.)
  - Applications in manufacturing, healthcare, and logistics
  - Ethics and societal impact of automation

Week 2: Robotics Programming Basics

- **Day 3: Introduction to Robot Programming**
  - Fundamental programming concepts (logic, loops, conditionals)
  - Basics of industrial robot motion control
- **Day 4: Hands-on Programming Lab**
  - Writing simple robot movement scripts
  - Understanding input/output (I/O) management

Week 3: Advanced Robotics Programming (Part 1)

- **Day 5: Motion Path Planning & Optimization**
  - Understanding trajectory planning
  - Programming robots for smooth and efficient movement
- **Day 6: Conditional Logic & Event Handling**
  - Implementing decision-making in robotic programs

accessible automation

- Managing real-time control with external inputs

Week 4: Advanced Robotics Programming (Part 2)

- **Day 7: Error Handling & Debugging**
  - Identifying and correcting programming errors
  - Real-time troubleshooting strategies
- **Day 8: Optimization & Performance Tuning**
  - Reducing execution time and improving efficiency
  - Refining robot motion paths for maximum precision

Week 5: Additive Manufacturing & 3D Printing

- **Day 9: Introduction to Additive Manufacturing**
  - Understanding 3D printing and its applications
  - Filament types (PLA, ABS, PETG, etc.)
- **Day 10: Hands-on 3D Printing Lab**
  - Designing a simple part in CAD (SolidWorks or Bambu Studio)
  - Printing and evaluating first prototype

Week 6: Pneumatics, Grippers & End Effectors

- **Day 11: Introduction to Pneumatic Systems**
  - Basics of pneumatic grippers and vacuum pumps
  - How actuators work in automation
- **Day 12: Hands-on End Effector Lab**
  - Programming a robotic gripper for object handling
  - Testing different materials and weights

Week 7: Application Engineering & Prototyping

- **Day 13: Designing an Automation Solution**
    - Identifying a problem and defining automation solutions
    - Collaborative brainstorming sessions
- **Day 14: Prototyping and System Testing**
    - Teams work on building their automation prototype
    - First round of debugging and improvements

Week 8: Extended Project Development (Part 1)

- **Day 15: Project Build & Initial Testing**
    - Teams refine designs and begin full-scale development
    - Testing hardware integration and troubleshooting
- **Day 16: Iterative Design & Optimization**
    - Adjusting mechanical and software components
    - Running first full test cycles

Week 9: Extended Project Development (Part 2)

- **Day 17: Project Refinement & Industry Feedback**
    - Testing and debugging final project builds
- **Day 18: Final Adjustments & Project Documentation**
    - Preparing final presentations and reports
    - Last debugging and performance evaluation

Week 10: Capstone Project Showcase & Graduation

- **Day 19: Final Project Presentation & Demonstration**
    - Teams present their completed automation projects

    - Industry professionals provide evaluations
- **Day 20: Graduation & Awards Ceremony**
    - Recognition of achievements